DOCKETED

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Project Title:	Humboldt Bay Generating Station - Compliance
TN #:	203635
Document Title:	Petition for Project Modification - Additional Emergency Eyewash and Shower Stations 02/06/15
Description:	N/A
Filer:	Mary Finn
Organization:	CH2M Hill
Submitter Role:	Applicant Consultant
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Pacific Gas and Electric Company®

Humboldt Bay Generating Station
1000 King Salmon Ave.
Eureka, CA 95503-6859

HBGS-CEC-095

February 6, 2015

Mr. Jonathan Fong
Compliance Project Manager
California Energy Commission
Siting, Transmission, and Environmental Protection Division
1516 Ninth Street, MS 2000
Sacramento, California 95814-5512

Subject: Petition for Project Modification, Humboldt Bay Generating Station (06-AFC-07C)

Dear Mr. Fong:

Enclosed please find a Project Modification for the Humboldt Bay Generating Station in compliance with Section 1769 of the California Energy Commission Siting Regulations. The modification is for the installation of five additional emergency eyewash and shower stations, which would enhance plant safety. The modification would not require the modification of any Conditions of Certification nor would it result in any environmental impacts or inconsistencies with any Laws, Ordinances, Regulations, or Standards (LORS).

Should you have any questions, please contact me at 707-269-1810.

Sincerely,

Scott Washington
Environmental Field Specialist

attachment

Project Modification

Humboldt Bay Generating Station
(06-AFC-07C)

Additional Emergency Eyewash and Shower Stations

Submitted to the

California Energy Commission

Submitted by

Pacific Gas & Electric Company

February 2015

With Assistance from:

Strachan Consulting, LLC

P.O. Box 1049
Davis, CA 95617

CH2MHILL
2485 Natomas Park Drive
Suite 600
Sacramento, CA 95833

Contents

SECTION 1

Introduction

1.1 Background

On September 24, 2008, the California Energy Commission (CEC) granted a license to Pacific Gas & Electric Company (PG&E) to construct and operate the Humboldt Bay Generating Station (HBGS). Construction began in September 2008 and the HBGS commenced commercial operation in October 2010.

Six emergency eyewash and shower stations and three portable self-contained eyewash station were installed during construction of the HBGS, in compliance with OSHA regulations. To enhance safety, PG&E proposes to add five additional emergency eyewash and shower stations throughout the plant site.

The proposed modification would not require changes to any Conditions of Certification, nor would it result in significant environmental impacts or non-compliance with Laws, Ordinances, Regulations, or Standards (LORS).

1.2 Description of Proposed Project Modification

There are currently six emergency eyewash and shower stations and three portable self-contained eyewash stations on the HBGS site. PG&E proposes to install five additional emergency eyewash and shower stations. In addition, three heaters would be installed to heat the water for the showers. Eight small concrete foundations would be poured for the emergency eyewash and shower stations and the heaters. In addition, aboveground and underground water pipelines and aboveground electrical lines would be installed to serve the additional emergency eyewash and shower stations and heaters, respectively.

The emergency eyewash and shower stations would use potable water provided by the Humboldt Community Services District (HCSC).

It is anticipated that less than ten employees would be required to install the emergency eyewash and shower stations. The construction duration would be less than one month. PG&E would like to install the additional emergency eyewash and shower stations during the first quarter of 2015.

Section 2.1 provides a detailed description of the proposed modification.

1.3 Necessity of Proposed Modification

Sections 1769 (a)(1)(A), (B), and (C) of the CEC Siting Regulations require a discussion of the necessity for the proposed modification to the HBGS project and whether the modification is based on information known by the petitioner during the certification proceeding. The HBGS has six existing emergency eyewash and shower stations and three portable self-contained eyewash stations in compliance with OSHA regulations. The five additional emergency eyewash and shower stations are proposed to enhance safety at the HBGS by reducing the distance between the emergency eyewash and shower stations on the plant site. Section 2.2 provides additional information regarding the necessity of the proposed modification.

1.4 Summary of Environmental Impacts

Section 1769 (a)(1)(E) of the CEC Siting Regulations requires that an analysis be conducted to address impacts the proposed modification may have on the environment and proposed measures to mitigate any significant adverse impacts. Section 1769 (a)(1)(F) requires a discussion on whether the proposed modification affects the facility's ability to comply with applicable laws, ordinances, regulations, and standards (LORS). The installation of the proposed additional eyewash stations would not result in any environmental impacts and is consistent with LORS. Section 3 provides an environmental analysis of the proposed modification and information regarding its consistency with LORS.

1.5 Consistency of Modifications with License

Section 1769 (a)(1)(D) of the CEC Siting Regulations requires a discussion of the consistency of the proposed project modification with the assumptions, rationale, findings, or other bases of the Final Decision and whether the modification is based on new information that changes or undermines the bases of the Final Decision. Also required is an explanation of why the modification should be permitted. The proposed modification does not undermine the assumptions, rationale, findings, or other basis of the Final Decision for the project. In addition, the proposed modification should be permitted since it would enhance safety at the HBGS.

SECTION 2

Description of Project Modification

Consistent with the CEC Siting Regulations Section 1769(a)(1)(A), this section includes a description of the requested project modification, as well as the necessity for it.

2.1 Proposed Modification

There are currently six emergency eyewash and shower stations on the HBGS site. Two are located within the engine hall building. A third station is located on the east side of the plant roadway, in the diesel fuel feeder pump area. The fourth station is located in the lube oil storage area and the fifth station is located within the ammonia storage tank containment area. The sixth emergency eyewash and shower station is in the Administration Building. Additionally, there are three self-contained eyewash stations installed near the plant battery installations. PG&E proposes to install five additional emergency eyewash and shower stations close to battery installations to enhance plant safety. In addition, three heaters would be installed to provide tempered (heated) water for the showers. Appendix A includes the engineering drawings for the emergency eyewash and shower stations, heaters, and required infrastructure.

As stated above, the new emergency eyewash and shower stations would be distributed throughout the HBGS site. The first and second stations would be located on the east and west sides of the Medium Voltage Control Building. The third and fourth stations would be located on the north and south sides of the Low Voltage Control Building. The fifth eyewash station would be located immediately south of the Fire House Building. In addition, three heaters would be installed. One heater would be located at the Medium Voltage Control Building. Another would be located at the Low Voltage Control Building. The third heater would be located at the Fire House Building. The locations of the proposed stations and heaters are depicted on drawing C-2 in Appendix A.

Installation of the emergency eyewash and shower stations and heaters would require the construction of eight small concrete foundations. The concrete pads for the emergency eyewash and shower stations would be 3'x4'x6". The concrete pads for the heaters would be 3'x1'x6". A concrete truck or portable concrete mixer would be brought on-site for the small foundations. To serve the emergency eyewash and shower stations, a new water pipeline would be installed. About 250-feet of 1.5- to 2-inch copper pipe would be installed aboveground and approximately 600 feet of 2-inch PVC pipe would be buried. The depth at which the pipe would be buried would vary from a minimum of 1.3 feet to a maximum of 5 feet, depending on the location of existing underground utilities. In addition, 800 feet of new aboveground electrical wiring would be installed to heat the water for the showers. The electrical line would be installed aboveground primarily within existing cable trays and within conduit to the specific heater locations, as required. The locations of the above- and belowground water pipelines and electrical line are depicted in drawings C-2 and E-1 respectively, in Appendix A.

The emergency eyewash and shower stations would use potable water provided by the Humboldt Community Services District (HCSD) through existing service lines to the HBGS. With the exception of monthly testing of the stations, use of the additional stations would not increase the amount of water used by the HBGS. The additional stations would simply reduce the distance a worker would have to travel to reach a station. The amount of water used for testing the additional stations is approximately 900 gallons per year. Each station would be tested once a month for 30 seconds at a rate of 30 gallons per minute. This small volume represents a negligible increase in the amount of potable water used by the plant.

The stations are proposed to be located near graveled areas of the plant and would be used only in the event of an emergency. Given the infrequent use and small volume of water anticipated to be used, the stations would drain to the permeable surface near where they are located.

It is anticipated that less than ten employees would be required to install the emergency eyewash and shower stations. The construction duration would be less than one month. PG&E intends to install the additional emergency eyewash and shower stations during the first quarter of 2015.

2.2 Necessity of Proposed Modification

Sections 1769 (a)(1)(B) and 1769(a)(1)(C) of the CEC Siting Regulations require a discussion of the necessity for the proposed modification to the project and whether this modification is based on information that was known by the petitioner during the certification proceeding. The HBGS has six existing emergency eyewash and shower stations and three portable, self-contained eyewash stations in compliance with OSHA requirements. However, HBGS personal have identified five additional locations where it would be beneficial to install an eyewash station. These additional stations are not required by existing LORS. They are being added to enhance plant safety.

The proposed project modification is based on information that was not known during the certification preceding. Preliminary design of the HBGS entailed the installation of six emergency eyewash and shower stations and three portable, self-contained eyewash stations in compliance with OSHA requirements. The proposal to install five additional emergency eyewash and shower stations was made recently based upon PG&E's intent to enhance safety at the HBGS, by locating stations closer to battery installations and decreasing the distance a worker would have to travel to reach a station in an emergency.

SECTION 3

Environmental Analysis of the Project Modification

PG&E has reviewed the proposed modification to determine if the modification would result in environmental impacts that were not originally analyzed by the CEC when it approved the project in September 2008. The only disciplines that could be affected by the modification described in this petition are Air Quality, Cultural Resources, Traffic and Transportation, and Water Resources. These are discussed in more detail below. The stations would be installed within the power plant site; therefore, there would be no impacts to Biological Resources. In addition, as stated in the Final Staff Assessment for the HBGS, "The potential for useful paleontological resources in fill, which represents the upper 2 to 6 feet of soils that will be impacted by project grading, is negligible due to disturbance of the material."[1] The maximum depth for ground disturbance associated with construction of the emergency eyewash and shower stations is estimated to be 5 feet; therefore, no impact to paleontological resources is anticipated.

The proposed modification discussed in this petition would not alter the operational impacts that were used as the basis to license the project during the original proceeding. Therefore, operational impacts are expected to be equal to those analyzed in the Final Decision and are not addressed in this petition. In addition, due to the short duration of construction and the minimal area of disturbance, no cumulative impacts would be expected. Lastly, the proposed Project is expected to comply with applicable laws, ordinances, regulations, and standards.

3.1 Air Quality

The installation of the five additional emergency eyewash and shower stations would take approximately one month. It is anticipated that less than ten construction workers would be on-site during the one-month installation period. A total of 4 delivery trucks would deliver the emergency eyewash and shower stations, heaters, and infrastructure. Table 3.1-1 presents the expected construction equipment and worker vehicles.

TABLE 3.1-1
HBGS Additional Eyewash Station Construction Equipment

Equipment / Vehicle List	Equipment / Vehicle Type	Quantity/Day
Mini Excavator	Construction Equipment	1
Portable Concrete Mixer	Construction Equipment	1
Delivery Trucks	Heavy-duty Diesel	4
Construction Worker Commute	Light-duty Auto/Truck	10

The potential air quality impacts associated with the proposed project would be due to construction air emissions in the form of tailpipe exhaust and fugitive dust from material movement. Emissions of reactive organic gases (ROG), carbon monoxide (CO), oxides of nitrogen (NOx), sulfur dioxide (SO_2), particulate

[1] California Energy Commission. Final Staff Assessment, Humboldt Bay Repowering Project, 2008, p. 5.2-7.

matter less than 10 microns in size (PM_{10}), and particulate matter less than 2.5 microns in size ($PM_{2.5}$) were estimated for on-site construction equipment and off-site worker commute and haul truck deliveries. Construction equipment emissions were estimated using Appendix D of the CalEEMod User's Guide (ENVIRON, 2013) for the year 2015. Emissions for worker commute and haul truck deliveries were estimated using emission factors from EMFAC2011 for Humboldt County, California. It was assumed that all trips would originate from near Eureka, California, with an average round trip distance of 15 miles. Fugitive dust emissions for material movement associated with the installation of 600 feet of underground piping were estimated using methodology found in AP-42 Chapter 13.2.4.3 (EPA, 2006). It was conservatively assumed that the piping trench would be dug to a depth of up to 5 feet, with a width up to approximately 2 feet, resulting in approximately 222 cubic yards of cut and fill. The actual depth at which the pipe would be buried would vary from a minimum depth of 1.3 feet to a maximum depth of 5 feet, depending on the location of existing underground utilities. The estimated maximum daily and project total criteria pollutant emissions are presented in Table 3.1-2, which shows that the expected construction air emissions from the project are negligible.

TABLE 3.1-2
Humboldt Bay Generating Station Construction Criteria Pollutant Air Emissi*ons*

	Criteria Pollutant Emissions					
Construction Year 2015	**ROG**	**CO**	**NOx**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
Daily Emissions (lb/day)	0.41	3.60	3.70	0.0055	0.20	0.16
Project Emissions (tons/project)	0.0045	0.040	0.041	0.000061	0.0022	0.0018

Project construction impacts from greenhouse gas (GHG) emissions were assessed by estimating the emissions of carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O) from the project. Emissions of CO_2 and CH_4 from construction equipment were estimated using Appendix D of the CalEEMod User's Guide (ENVIRON, 2013). Emissions of N_2O from construction equipment were estimated using fuel consumption estimates from the OFFROAD2011 model for the North Coast Air Basin and emission factors from The Climate Registry's (TCR) Default Emissions Factors Table 13.7 (TCR, 2014). Emissions of CO_2 from worker commute and haul truck deliveries were estimated using emission factors from EMFAC2011 for Humboldt County, California, while emissions of CH_4 and N_2O were estimated using emission factors from TCR's Default Emissions Factors Table 13.5 (TCR, 2014). The estimated maximum daily and project total GHG emissions are presented in Table 3.1-3. Appendix B presents the detailed calculations for the construction emission estimates.

TABLE 3.1-3
Humboldt Bay Generating Station Construction Greenhouse Gas Air Emissions

Construction Year 2015	**CO_2**	**N_2O**	**CH_4**	**CO_2e**
Project Emissions (metric tons/project)	5.64	6.5E-04	3.5E-04	5.76

Based on the limited duration and nature of the eyewash and shower station construction and the estimated criteria and GHG emissions, air quality impacts are expected to be insignificant and these impacts will not alter the basis of the Commission's Decision for the project.

The installation of the five additional emergency eyewash and shower stations is not expected to result in cumulative air quality impacts nor alter the basis of the Commission Decision. In addition, the proposed project is expected to comply with applicable laws, ordinances, regulations, and standards.

3.2 Cultural Resources

The construction and installation of the five emergency eyewash and shower stations is not anticipated to affect cultural resources. This is because ground disturbance associated with the installation of the water pipeline serving the stations and the foundations for the 5 stations and 3 heaters would occur in areas of the HBGS site that were previously disturbed during HBGS construction. Appendix C contains a technical memorandum prepared by Dimitra Zalavaris-Chase, who served as the Cultural Resources Monitor during HBGS construction and currently serves as the Coastal Commission approved Cultural Resources Specialist for decommissioning of the Humboldt Bay Power Plant. The technical memorandum provides information on the culturally sensitive strata, the A-Horizon, on the HBGS site in relation to previous disturbance on the site and construction and installation of the emergency eyewash and shower stations. It is not anticipated that construction and installation of the stations will intersect the A-Horizon. Therefore, cultural monitoring is not proposed.

3.3 Traffic and Transportation

Access to the HBGS site is from King Salmon Ave., which intersects with US Highway 101. HBGS workers currently use a temporary access road that was constructed for use during HBGS construction and is now also being used for Humboldt Bay Power Plant (HBPP) decommissioning. HBPP decommissioning commenced once HBGS began commercial operation in October 2010.

King Salmon Avenue is a county-maintained road between US 101 and the community of King Salmon. In addition to HBGS, it is also the main access road to the entrance of the HBPP. King Salmon Avenue is lightly traveled by passenger cars and trucks. Heavy trucks are primarily limited to those associated with HBPP decommissioning.

According to the Humboldt County Public Works Department, King Salmon Avenue carried approximately 2,355 vehicles per day in June 1973. Only total daily traffic counts were measured during this County survey; therefore, truck traffic and peak-hour volume data were not available for King Salmon Avenue (CH2M HILL, 2006). The County did additional surveys in July 2009 over five days. During this survey period, there was a range of 1,339 to 1782 average daily traffic.

Traffic count data was also assessed for three locations on King Salmon Avenue in March 2009, by LACO Associates (LACO Associates, 2009) for the permitting of HBPP decommissioning. Table 3.2-1 provides the summary of intersection level of service (LOS) for existing morning and evening traffic conditions.

Pedestrian and bicycle traffic was also observed during the traffic counts and was reported to be light, with fewer than five per hour for each intersection (LACO Associates, 2009).

TABLE 3.2-1
Levels of Service, Project Area Intersections

	Northbound		Southbound		Eastbound		Westbound	
	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS
Study Intersection Morning								
Site No. 1, King Salmon and West Ramps			9.1	A			7.5	A
Site No. 2, King Salmon and	10.5	B	9.6	A	7.5	A		

TABLE 3.2-1
Levels of Service, Project Area Intersections

	Northbound		Southbound		Eastbound		Westbound	
	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS
East Ramps								
Site No. 3, King Salmon and West Entrance			7.3	A			9.2	A
Study Intersection Evening								
Site No. 1, King Salmon and West Ramps			9.5	A			7.6	A
Site No. 2, King Salmon and East Ramps	12.4	B	9	A	7.5	A		
Site No. 3, King Salmon and West Entrance			7.3	A			9.0	A

Note:
Delay is in average number of seconds per vehicle.
Source: LACO Associates, 2009.

Staffing levels on the overall site (HBPP and HBGS), both for HBPP decommissioning and HBGS commissioning and operation workers, peaked in late 2009 through 2010 when an estimated 500 staff were on-site. During this time, there were no reported issues with traffic backing up onto King Salmon Avenue.

There are two decommissioning activities currently occurring on the HBPP site – removal of the reactor vessel caisson and spent fuel pool, and remediation of the intake and discharge canals. These activities are estimated to have a peak workforce of 60 and 35 workers, respectively. This would be in addition to baseline staffing levels required to provide project management and oversight, radiological protection, waste management, and other core services that would remain with PG&E. The reactor vessel caisson and spent fuel pool removal and canal remediation activities have not yet reached their peak workforce and would not do so during the time period when the HBGS emergency eyewash and shower stations would be installed. In addition, haul truck activity for both projects (approximately 30 trips per day, peak, for the reactor vessel caisson and spent fuel pool and approximately 1,000 total truck trips during the four year duration of the canal remediation project) have not yet commenced and are not expected to do so before the HBGS emergency eyewash and shower stations would be installed.

In addition to the HBPP decommissioning workers, there would 14 HBGS workers on-site during the time period when construction of the stations would occur. Construction of the emergency eyewash and shower stations would require less than 10 workers. In addition, approximately 4 deliveries of equipment would be required. The number of eyewash and shower station workers and deliveries (14), coupled with the peak worst-case number of construction workers required for current HBPP decommissioning activities (95), HBGS employees (14), and existing truck hauling activity, is far less than the HBPP decommissioning and HBGS commissioning and operations staffing peak of 500. Because daily traffic estimates would be less than those previously experienced at the project site, potential impacts would not significantly alter the current level of service to King Salmon Avenue. Therefore, no traffic impacts are anticipated with the construction of the five emergency eyewash and shower stations.

3.4 Water Resources

The HBGS is estimated to use an average of 0.11 gpm, less than 0.182 acre-feet/year, of potable water for domestic uses, including eyewash and safety shower stations.[2] The water is provided by the Humboldt Community Services District (HCSD). There is no Condition of Certification which specifies the amount of potable water the HBGS can use. However, Condition Soil & Water-5 requires that PG&E submit an annual Water Use Summary, which specifies the amount of water used by the facility each year. For the October 2013 – September 2014 reporting period, HBGS used 0.232 acre-feet (0.14 gpm) of potable water for domestic use.

With the exception of monthly testing of the five emergency eyewash and shower stations, use of the additional stations would not increase the amount of water used by the HBGS. The additional stations would simply reduce the distance a worker would have to travel to reach a station. The amount of water used for testing the additional stations is conservatively estimated to be approximately 900 gallons per year. Specifically, each station would be tested once a month for 30 seconds at a rate of 30 gallons per minute. This amount equates to 0.002 acre-feet/year, which is a negligible increase. Given this, the five additional emergency eyewash and shower stations would not result in an impact to water resources.

[2] California Energy Commission. Final Staff Assessment, Humboldt Bay Repowering Project, 2008, p. 4.9-15.

SECTION 4.0

Proposed Modifications to the Conditions of Certification

Consistent with the requirements of the CEC Siting Regulations Section 1769 (a)(1)(A), this section addresses any proposed modifications to the project's Conditions of Certification. The addition of the five proposed emergency eyewash and shower stations would not require modification to any of the HBGS Conditions of Certification.

SECTION 5

Potential Effects on the Public and Property Owners

The CEC Siting Regulations Section 1769(a)(1)(I), requires the project owner address any potential effects the proposed project modification may have on nearby property owners, the public and parties to the proceeding.

The proposed modification to install five additional emergency eyewash and shower stations would have no impact on nearby property owners, the public, and parties to the proceeding. Construction efforts associated with installation of the stations would be within the HBGS site boundaries. The traffic associated with the construction would be minimal given the few workers needed (less than 10) and the construction duration of less than one month. Lastly, water use for the monthly testing of the stations would result in a negligible increase.

SECTION 6

List of Property Owners

CEC Siting Regulations Section 1769(a)(1)(H) requires that a list of property owners potentially affected by the modification be provided. The proposed addition of five emergency eyewash and shower stations to be located within the HBGS site would not affect property owners near the HBGS site. Construction efforts associated with installation of the stations would be within the HBGS site boundaries. The traffic associated with construction would be minimal given the few workers needed (less than 10) and the construction duration of less than one month. Lastly, water use for the monthly testing of the stations would result in a negligible increase.

SECTION 7

References

California Energy Commission. 2008. *Final Staff Assessment, Humboldt Bay Repowering Project*. May 15.

CH2M HILL. 2006. *Application for Certification, Humboldt Bay Repowering Project*. Prepared for PG&E and submitted to CEC. September.

CH2M Hill. 2013. Project Description and Coastal Resources Assessment to Amend Humboldt Bay Power Plant CDP E-09-010 for the Spent Fuel Pool and Reactor Caisson Removal Project. January.

CH2M Hill. 2013. Project Description and Coastal Resources Assessment, Humboldt Bay Power Plant Intake and Discharge Canal Remediation Project. January.

ENVIRON. 2013. *CalEEMod User's Guide*. October.

LACO Associates. 2009. Draft Study of Traffic Impacts Related to Humboldt Bay Power Plant Decommissioning and Humboldt Bay Generating Station Construction. August 10.

Appendix A
Engineering Drawings

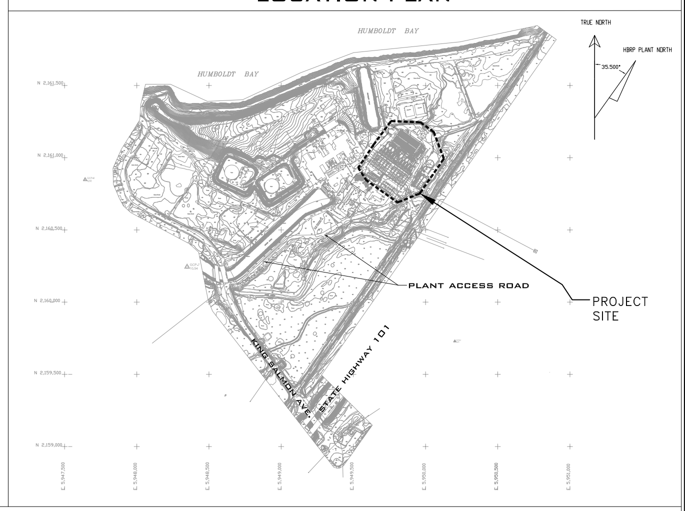
Pacific Gas & Electric CO.
Humboldt Bay Generating Station

1000 King Salmon Ave.
Eureka, CA 95503

EMERGENCY EYE WASH AND SHOWER STATIONS

Engineers: Chow Engineering Inc.
7770 Pardee Lane
Oakland, CA 94621
Phone: (510) 636-8500 Fax: (510) 636-8544

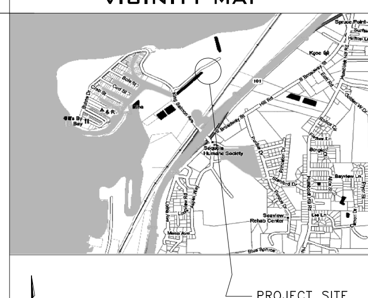
LOCATION PLAN



ABBREVIATIONS

A.F.F.	above finish floor	GLU	glue
A.G.	above grade, above ground	GA	gage
AGG	aggregate	G.B.	grade break
ALT	alternate	HK	hook
ANCH	anchor	HORIZ	horizontal
APPROX	approximately	INSUL	insulated
@	at	ISA	International Symbol of Accessibility
B.G.S.	below grade surface	LONG	longitudinal
BLDG	building	MFR	manufacturer
B.O.F.	bottom of footing or foundation	MATL	material
BOT	bottom	MAX	maximum
CBC	California Building Code	MIN	minimum or minute
CTR	center	MISC	miscellaneous
CIDH	cast-in-drilled hole concrete pile	N.F.	near face
C/C	center to center	N.S.	near side
CLR	clear	N	north
COL	column	(N)	new
CONC	concrete	N.I.C.	not in contract
C.M.U	concrete masonary unit	N.T.S.	not to scale
CONN	connection	O.C.	on center
CONST	construction grade	OPNG	opening
CONSTR	construction	OPP	opposite
C.J.	construction joint	O.D.	outside diameter
CONT	continuous, continued	LB	pound
DET	detail	PSI	pounds per square inch
DIA	diameter	PSF	pound per square foot
DIM	dimension	REF	reference
D.F.	Douglas Fir	REINF	reinforcing steel
DN	down	SECT	section
DWG	drawing	SF	square foot or square feet
EA	each	SPEC	specification
E.F.	each face	STD	standard
E.W.	each way	STL	steel
EL	elevation	STRUCT	structural
ENGR	engineer	SYMM	symmetrical
EQ	equal	T.O.C.	top of concrete
EXST, (E)	existing	T.O.S.	top of steel
EXT	exterior	TRANS.	transverse
F.G.	finished grade	TYP	typical
F.F.	finished floor	TOT	total
FTG	footing	U.G.	underground
FDN	foundation	U.O.N.	unless otherwise noted
JT	joint	W/	with

VICINITY MAP



DRAWING INDEX

SCOPE OF PROJECT

SCOPE OF WORK ON THESE PLANS INCLUDE:

1. INSTALLATION OF FIVE (5) EMERGENCY EYEWASH AND SHOWER SAFETY STATIONS WITH THREE (3) WATER HEATERS INCLUDING BELOW GRADE PIPING (BURRIED), ABOVE GRADE PIPING (INSULATED) WITH HANGERS AND SUPPORTS, AND CONNECTIONS TO EXISTING POTABLE WATER SUPPLY.

REVISIONS	DRAWN	DATE
100% SUBMITTAL	DPW	11/11/2013
RESUBMITTAL	DPW	2/12/2014
ADDED HEATER UNITS & E1 DWG	DPW	10/31/2014
COMMENTS ON 95% SUBMITTAL INCORPORATED	DPW	11/19/2014
100% SUBMITTAL	DPW	11/21/2014

CHOW ENGINEERING, INC.
7770 PARDEE LANE, SUITE 100
OAKLAND, CA 94621
Phone: (510) 636-8500 Fax: (510) 636-8544
Web: www.choweng.com E-Mail: info@choweng.com

SHEET TITLE: COVER SHEET
EMERGENCY EYE WASH AND SHOWER STATIONS

OWNER: PACIFIC GAS & ELECTRIC COMPANY
1000 KING SALMON AVE.
EUREKA, CA 95503

STAMP
REGISTERED PROFESSIONAL ENGINEER
DEAN WANZEK
C 54717
Exp. 12/31/15
CIVIL
STATE OF CALIFORNIA
11/20/2014

DATE 11-20-2014
DRAWN DA
CHECKED DW
JOB NO. 13R-120
SCALE NTS
DRAWING No. C-0
SHEET No. 1 of 6
REV. R1

DPW, Chow Eng 11/20/2014 3:13 PM 13R-120-showers C-0 R1.dwg

GENERAL NOTES

1. ALL WORK SHALL BE IN COMPLIANCE WITH THE 2013 CALIFORNIA BUILDING CODE, 2013 CALIFORNIA FIRE CODE, 2013 CALIFORNIA MECHANICAL CODE, 2013 CALIFORNIA ELECTRICAL CODE, 2013 CALIFORNIA PLUMBING CODE, AND ALL APPLICABLE LOCAL, STATE, AND FEDERAL LAWS AND REGULATIONS.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE PROJECT DOCUMENTS WITH CONDITIONS AT THE SITE, AND SHALL VERIFY EXISTING DIMENSIONS, ELEVATIONS, AND CONDITIONS. ANY DISCREPANCIES SHALL BE REPORTED TO THE ENGINEER AND SHALL BE RESOLVED BEFORE PROCEEDING WITH THE WORK. ANY DEVIATION, SUBSTITUTION OR ALTERATION TO THE DESIGN SHALL BE SUBJECT TO REVIEW BY THE ENGINEER.
3. ALL BUILDING AND UTILITY INFORMATION SHALL BE VERIFIED AND/OR REVISED AS NECESSARY BY THE CONTRACTOR IN THE FIELD.
4. DRAWINGS INDICATE GENERAL AND TYPICAL DETAILS OF CONSTRUCTION. WHERE CONDITIONS ARE NOT SPECIFICALLY INDICATED BUT ARE OF SIMILAR CHARACTER TO DETAILS SHOWN, SIMILAR DETAILS OF CONSTRUCTION SHALL BE APPLIED, SUBJECT TO REVIEW BY THE ENGINEER.
5. THIS IS AN ENERGIZED FACILITY. CONTRACTOR SHALL TAKE ALL PRECAUTIONS TO PREVENT CONTACT WITH HIGH VOLTAGE EQUIPMENT, CONDUITS, AND POWER LINES.
6. CONTRACTOR SHALL SUBMIT 3 SETS OF SHOP DRAWINGS TO THE OWNER (PG&E) FOR APPROVAL.
7. STRUCTURAL CONSULTATION AND OBSERVATION BY THE DESIGN ENGINEER SHALL BE PERFORMED ON A "AS NEEDED BASES".
8. ALL WORK OR CONSTRUCTION SHALL COMPLY WITH ALL APPLICABLE BUILDING CODES, REGULATION AND SAFETY REQUIREMENTS.
9. DISCREPANCIES: THE CONTRACTOR SHALL INFORM THE ENGINEER IN WRITING OF ANY DISCREPANCIES OR OMISSIONS NOTED ON THE DRAWINGS OR IN THE SPECIFICATIONS OR OF ANY VARIATIONS NEEDED IN ORDER TO CONFORM TO CODES, RULES AND REGULATIONS. UPON RECEIPT OF SUCH INFORMATION, THE ENGINEER WILL SEND WRITTEN INSTRUCTIONS TO ALL CONCERNED. ANY SUCH DISCREPANCY, OMISSION, OR VARIATION NOT REPORTED SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR, AND WORK SHALL BE PERFORMED IN A MANNER AS DIRECTED BY THE ENGINEER.
10. IT SHALL BE THE CONTRACTOR'S SOLE RESPONSIBILITY TO DESIGN AND PROVIDE ADEQUATE SAFETY PRECAUTIONS AS REQUIRED FOR THE PROTECTION OF LIFE AND PROPERTY DURING THE CONSTRUCTION.
11. SAFETY: THE CONTRACTOR SHALL ADEQUATELY PROTECT HIS WORK, ADJACENT PROPERTY, AND THE PUBLIC, AND BE RESPONSIBLE FOR DAMAGE OR INJURY DUE TO HIS ACT OR NEGLECT.
12. INSPECTIONS: ANY INSPECTIONS, SPECIAL OR OTHERWISE, THAT ARE REQUIRED BY THE BUILDING CODES, LOCAL BUILDING DEPARTMENTS, OR THESE PLANS, SHALL BE DONE BY AN INDEPENDENT INSPECTION COMPANY. JOB SITE VISITS BY THE ENGINEER DO NOT CONSTITUTE, OR SUBSTITUTE, INSPECTIONS UNLESS SPECIFICALLY CONTRACTED FOR.
13. ALL CONTRACTORS AND SUBCONTRACTORS PERFORMING WORK SHOWN ON OR RELATED TO THESE PLANS SHALL CONDUCT THEIR OPERATIONS SO THAT ALL EMPLOYEES ARE PROVIDED A SAFE PLACE TO WORK AND PG&E EMPLOYEES AND THE PUBLIC ARE PROTECTED. ALL CONTRACTORS AND SUBCONTRACTORS SHALL COMPLY WITH THE "OCCUPATIONAL SAFETY AND HEALTH REGULATION" OF THE U.S. DEPARTMENT OF LABOR AND WITH THE STATE OF CALIFORNIA DEPT. OF INDUSTRIAL RELATIONS' "CONSTRUCTION SAFETY ORDERS."
14. THE CIVIL ENGINEER SHALL NOT BE RESPONSIBLE IN ANY WAY FOR THE CONTRACTORS' AND SUBCONTRACTORS' COMPLIANCE WITH THE "OCCUPATIONAL SAFETY AND HEALTH REGULATION: OF THE U.S. DEPARTMENT OF LABOR OR WITH THE STATE OF CALIFORNIA DEPARTMENT OF INDUSTRIAL RELATIONS' "CONSTRUCTION SAFETY ORDERS."
15. CONTRACTOR AGREES THAT HE/SHE WILL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS; AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD THE ENGINEER HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE ENGINEER.
16. PERMITS: THE CONTRACTOR AND/OR SUBCONTRACTORS SHALL OBTAIN ALL REQUIRED PERMITS.
17. ALL CONTRACTORS PERFORMING WORK ON THIS PROJECT SHALL FAMILIARIZE THEMSELVES WITH THE SITE AND SHALL BE SOLELY RESPONSIBLE FOR ALL DAMAGE TO EXISTING FACILITIES RESULTING DIRECTLY OR INDIRECTLY FROM THEIR OPERATIONS, WHETHER OR NOT SHOWN ON THESE DRAWINGS.
18. AS-BUILTS: THE CONTRACTOR SHALL SUBMIT "AS-BUILT" DRAWINGS TO THE OWNER (PG&E) UPON COMPLETION OF WORK.

SPECIAL INSPECTIONS

1. ANY INSPECTIONS, SPECIAL OR OTHERWISE, THAT ARE REQUIRED BY THE BUILDING CODES, LOCAL BUILDING DEPARTMENTS, OR THESE PLANS, SHALL BE DONE BY AN INDEPENDENT INSPECTION COMPANY. JOB SITE VISITS BY THE ENGINEER DO NOT CONSTITUTE, OR SUBSTITUTE, INSPECTIONS UNLESS SPECIFICALLY CONTRACTED FOR.
2. THE CONTRACTOR SHALL BE RESPONSIBLE TO COMPLY WITH ALL SPECIAL INSPECTIONS REQUIRED BY THE STATE AND LOCAL AGENCIES AS STATED IN CBC SECTION 1704.

CONSTRUCTION

1. FIRE EXTINGUISHER: CONTRACTOR SHALL PROVIDE AND MAINTAIN A PORTABLE FIRE EXTINGUISHER OF THE TYPE SIZE APPROVED BY THE FIRE DEPARTMENT FIELD INSPECTOR AT THE JOB SITE THROUGHOUT CONSTRUCTION.
2. NO HAZARDOUS MATERIALS: NO HAZARDOUS CHEMICALS OR MATERIALS SHALL BE USED OR STORED IN THIS AREA OR ADJACENT AREAS TO THIS PROJECT.
3. COMPLY W/DRAWINGS: IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE, SUPERVISE, AND COMMUNICATE WITH THE ENGINEER, OWNER, AND SUBCONTRACTORS ALL WORK TO INSURE CONFORMANCE WITH THE APPROVED DRAWINGS AND SPECIFICATIONS.
4. PRIOR WRITTEN APPROVAL AND HOT WORK PERMIT FOR ALL FIELD WELDING IS REQUIRED.
5. RIGGING: ALL RIGGING SHALL BE SCHEDULED, COORDINATED, AND HAVE PRIOR APPROVAL FROM OWNER (PG&E).
6. SITE CLEANLINESS: CONTRACTOR SHALL PROVIDE LABOR AND EQUIPMENT FOR DEMOLITION AND REMOVAL OF DEBRIS. LIMITED CONSTRUCTION SPACE REQUIRES THAT ACCUMULATION OF DEBRIS BE REMOVED AT FREQUENT INTERVALS.
8. ADJUST (E) TO (F.G.): EXISTING SLABS, CURBS, GUTTERS AND ASPHALT & CONCRETE PAVEMENT WITHIN THE LIMITS OF NEW CONSTRUCTION SHALL BE ADJUSTED TO FINAL GRADE, UNLESS INDICATED OTHERWISE.
9. CONCRETE JOINTS: JOINTS IN CONCRETE CURBS, GUTTERS AND WALKS SHALL BE CONSTRUCTED IN ACCORDANCE WITH SECTION 303-5.4 OF THE "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION" UNLESS INDICATED OTHERWISE.
11. SAWCUT REMOVALS: ALL PAVEMENT AND CONCRETE REMOVALS SHALL BE SAWCUT.

EARTHWORK

1. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL EXCAVATION PROCEDURES INCLUDING LAGGING, SHORING, AND PROTECTION OF ADJACENT PROPERTY, STRUCTURES, STREETS AND UTILITIES IN ACCORDANCE TO THE OWNERS REQUIREMENTS.
2. UNDERGROUND UTILITIES: THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ALL BELOW GROUND UTILITES ON OR ADJACENT TO THE ZONE OF CONSTRUCTION. CONTRACTOR SHALL TAKE NECESSARY PRECAUTIONS TO PREVENT DAMAGE TO UNDERGROUND UTILITIES, VAULTS, FIRE HYDRANTS, OVERHEAD POWER LINES OR ANY OTHER EXISTING INSTALLATIONS
3. ASPHALT AND CONCRETE SPOILS SHALL BE HAULED OFF SITE.
4. EXCESS SOIL SPOILS SHALL BE HAULED ON SITE TO SPECIFIED LOCATION PER PG&E INSTRUCTIONS.
8. COMPACTION (MIN): FILL AND BACK FILL SHALL BE COMPACTED IN LAYERS NOT EXCEEDING 8 INCHES IN LOOSE THICKNESS, AT A MOISTURE CONTENT WITHIN 2% OF THE OPTIMUM AS DETERMINED BY A.S.T.M. SOIL COMPACTION TEST D1557.
9. FIELD DENSITY: SHALL BE DETERMINED BY NUCLEAR GAUGE OR DRIVE CYLINDER METHOD. IN FINE-GRAINED COHESIVE SOILS, FIELD DENSITY MAYBE DETERMINED BY THE DRIVE-CYLINDER METHOD, A.S.T.M. D2937-71, THE METHOD OF DETERMINING FIELD DENSITY SHALL BE SHOWN IN THE COMPACTION REPORT. OTHER METHODS MAY BE USED IF RECOMMENDED BY THE SOIL ENGINEER AND APPROVED IN ADVANCE BY BUILDING OFFICIAL.
10. FILL PLACEMENT: NO FILL SHALL BE PLACED UNTIL STRIPPING OF VEGETATION, REMOVAL OF UNSUITABLE SOILS, AND INSTALLATION OF SUBDRAINS (IF ANY) HAVE BEEN INSPECTED AND APPROVED BY THE SOIL ENGINEER.
11. BASE MATERIALS: AGGREGATE BASE SHALL BE EITHER CRUSHED AGGREGATE BASE OR CRUSHED MISCELLANEOUS RECYCLABLE BASE AS DEFINED IN SECTION 200-2.2 AND SECTION 200-2.4 RESPECTIVELY OF THE "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION" UNLESS INDICATED OTHERWISE.

PAVING

1. AGGREGATE FOR GRAVELED AREAS SHALL MEET THE REQUIREMENTS OF CALTRANS CLASS 2 AGGREGATE BASE OR ASTM D448 SIZE NUMBER 27.
2. AGGREGATE FOR SUB-BASE SHALL MEET THE REQUIREMENTS OF CALTRANS CLASS 2 AGGREGATE SUB-BASE.
3. AGGREGATE FOR ASPHALT CONCRETE SHALL CONFORM CALTRANS SPECIFICATIONS. AGGREGATE SHALL BE TYPE B, 3/4" MAXIMUM, MEDIUM GRADE. ASPHALTIC CONCRETE MIXES SHALL CONFORM TO CALTRANS STANDARD SPECIFICATIONS, PERFORMANCE GRADE (PG) 64-10.

CONCRETE ANCHORS

1. POST-INSTALLED ANCHORS SHALL BE AS FOLLOWS. NO SUBSTITUIONS ARE ALLOWED UNLESS WRITTEN APPROVAL IS GIVEN BY THE ENGINEER. ALL ANCHORS SHALL MEET THE REQUIREMENTS OF THE ICC REPORT LISTED.

   A. MECHANICAL ANCHORS SHALL BE HILTI KWIK BOLT TZ STAINLESS STEEL ANCHORS INSTALLED PER ICC ESR-1917. PERIODIC SPECIAL INSPECTION IS REQUIRED.

   B. ADHESIVE ANCHORS SHALL BE HILTI HIT-RE 500-SD ADHESIVE ANCHORS INSTALLED PER ICC ESR-2322. UNLESS NOTED OTHERWISE, USE STAINLESS STEELTHREADED ROD . PERIODIC SPECIAL INSPECTION IS REQUIRED.

CONCRETE AND REINFORCEMENT

1. DEBRIS: REMOVE ALL DEBRIS FROM FORMS BEFORE POURING.
2. INSERTS: ALL ITEMS TO BE CAST IN CONCRETE SUCH AS REINFORCING, DOWELS, BOLTS, ANCHORS, PIPES, SLEEVES, ETC., SHALL BE SECURELY POSITIONED IN THE FORMS BEFORE PLACING CONCRETE.
3. SPLICES: SPLICE BARS IN MEMBERS SUCH AS SPANDRELS, BEAMS, ETC., AS FOLLOWS: TOP BARS AT CENTERLINE OF SPAN, BOTTOM BARS AT THE SUPPORT. ALL REINFORCING STEEL SHALL BE SECURELY WIRED AND PROPERLY SUPPORTED ABOVE GROUND AND AWAY FROM THE FORMS.
4. CONSTRUCTION JOINTS: CONSTRUCTION JOINTS SHALL HAVE ENTIRE SURFACE REMOVED TO EXPOSE CLEAN, SOLIDLY EMBEDDED AGGREGATE. THE CONTRACTOR SHALL OBTAIN THE ENGINEER'S APPROVAL OF CONSTRUCTION JOINT LOCATION IN SLABS AND BEAMS.
5. TEMPERATURE AND SHRINKAGE REINFORCEMENT: SHALL HAVE A LAP OF THIRTY (30) BAR DIAMETERS, BUT NOT LESS THAN 18 INCHES, AND THE SPLICES IN ADJACENT BARS SHALL BE NOT LESS THAN FIVE (5) FEET APART.
6. REBAR GRADES: ALL REINFORCING STEEL SHALL BE NEW STOCK DEFORMED BARS CONFORMING TO ASTM A615 OR A706 AS FOLLOWS:
   #3 & SMALLER BARS......................................GRADE 40
   #4 & LARGER BARS.......................................GRADE 60
7. WELDED WIRE FABRIC: WELDED WIRE FABRIC SHALL CONFORM TO ASTM A82 AND A185.
8. WELDING: TACK WELDING OF REBAR IS NOT PERMITTED UNLESS CALLED FOR OR APPROVED BY THE ENGINEER. WELDING OF STIRRUPS, TIES, INSERTS OR OTHER SIMILAR ELEMENTS TO LONGITUDINAL REINFORCING BARS SHALL NOT BE PERMITTED.
9. REBAR COVER: MINIMUM REBAR COVER FOR CONCRETE SHALL BE AS SHOWN IN THIS TABLE:

EXPOSURE CONDITION		MINIMUM COVER	TOLERANCE (-)
CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH:		3"	3/8 INCH
EXPOSED TO EARTH OR WEATHER:			
NO. 5 AND SMALLER BARS		1-1/2"	1/4 INCH
NO. 6 AND LARGER BARS		2"	1/4 INCH
SLABS ON GRADE	TOP BARS:	1-1/2"	1/4 INCH
	BOTTOM BARS:	3"	3/8 INCH

10. TOLERANCES FOR REBAR PLACEMENT: TOLERANCE FOR LONGITUDINAL LOCATION OF BENDS AND ENDS OF REINFORCEMENT SHALL BE PLUS OR MINUS TWO (2) INCHES, EXCEPT AT DISCONTINUOUS ENDS OF MEMBERS WHERE TOLERANCES SHALL BE ±1/2 INCH.
11. CONCRETE QUALITY: SHALL BE AS SHOWN IN TABLE BELOW:

CONCRETE USE	STRENGTH AT 28 DAYS	SLUMP	AIR	AGGREGATE SIZE	AGGREGATE TYPE
ALL (OTHERWISE NOTED)	3500	4"	–	1"	HARDROCK
PILE FOUNDATION	5000	4"	–	1"	HARDROCK

12. CONCRETE WEIGHT: ALL CONCRETE SHALL BE OF REGULAR WEIGHT OF 145 POUNDS PER CUBIC FOOT UNLESS NOTED OTHERWISE.
13. AGGREGATE: SIZE OF AGGREGATE SHALL CONFORM TO ASTM C33-85.
   3/4"......................................ASTM SIZE C67
   1"...ASTM SIZE C57
14. CEMENT: SHALL BE TYPE II.
15. CONCRETE AGE: NO MORE THAN 90 MINUTES SHALL ELAPSE BETWEEN CONCRETE BATCHING AND CONCRETE PLACEMENT UNLESS APPROVED BY TESTING AGENCY.
16. WET SET: REINFORCEMENT MAY NOT BE WET SET IN CONCRETE POURS.
17. ROUGHENED SURFACES: WHERE INDICATED ON THE DRAWINGS, ROUGHENED SURFACES SHALL BE PROVIDED BY MEANS OF HEAVY RAKING OR GROOVING. OTHER METHODS MAY BE ACCEPTABLE PENDING WRITTEN APPROVAL FROM THE ENGINEER. ALL INTERFACING SURFACES MUST BE CLEAN AND FREE OF LOOSE MATERIALS.
18. ADMIXTURES: NO ADMIXTURES SHALL BE ADDED TO THE CONCRETE MIX WITHOUT THE APPROVAL OF THE ENGINEER, UNLESS NOTED OTHERWISE. ADMIXTURES OR CONCRETE CONTAINING CHLORIDES SHALL NOT BE USED.
19. CURING: CONCRETE SHALL BE MAINTAINED ABOVE 50F AND IN A CONTINUOUSLY MOIST CONDITION FOR AT LEAST 7 DAYS AFTER PLACEMENT. ALTERNATIVELY, THE CURING COMPOUND METHOD MAY BE USED. PROTECT CURING COMPOUND FROM DAMAGE FOR 7 DAYS AFTER PLACEMENT OF CONCRETE.
19. FINISH: CONCRETE SHALL HAVE A LIGHT BROOM FINISH.

LEGEND

(1 / SD-1) ← SECTION OR DETAIL NUMBER
← DRAWING NUMBER ON WHICH SECTION OR DETAIL APPEARS

– – – – – EXISTING STRUCTURE OR EQUIPMENT

POTABLE WATER NOTES:

1. ABOVE GRADE POTABLE WATER PIPING SHALL BE COPPER TUBE ASTM B88 TYPE L.
2. BURIED POTABLE WATER PIPING 3 INCHES AND SMALLER SHALL BE CPVC COMPOUND WITH A CELL CLASS OF 23447 PER ASTM D1784 AND CONFORM TO NATIONAL SANITATION FOUNDATION (NSF) STANDARDS 14 AND 61.
3. CPVC PIPE SHALL BE SCH 80 IPS (Iron Pipe Size) CONFORMING TO ASTM F441. FITTINGS SHALL CONFORM TO ASTM F439.
4. A 10 GAGE COPPER TRACING WIRE SHALL BE INSTALLED ABOVE ALL BURIED WATER PIPING AND SECURED TO THE PIPING AT 6 FOOT MAXIMUM INTERVALS. COPPER WIRE SHALL BE TESTED FOR CONTINUITY AFTER PLACEMENT AND COMPACTION OF BACKFILL.
5. PIPE HANGERS AND SUPPORTS: INSTALL IN ACCORDANCE WITH ASME B31.9, ASTM F708 AND MSS SP89.
6. USE HANGERS WITH 1-1/2" MIN VERTICAL ADJUSTMENT. DESIGN HANGERS FOR PIPE MOVEMENT WITHOUT DISENGAGEMENT OF SUPPORTED PIPE.
7. ABOVE GROUND POTABLE WATER PIPING SHALL BE INSULATED WITH 1-1/2" MOLDED GLASS FIBER PIPE INSULATION, ASTM C547, WITH VAPOR BARRIER JACKET, ASTM C1136, TYPE 1, FACTORY APPLIED REINFORCED FOIL KRAFT WITH SELF SEALING ADHESIVE JOINTS.
8. EXTERIOR ABOVE GROUND PIPING SHALL HAVE A ALUMINUM PIPE JACKET, ASTM B209. SHEET THICKNESS TO BE 0.04 INCHES WITH SMOOTH FINISH AND LONGITUDINAL SLIP JOINTS AND 2 INCH LAPS. FITTINGS TO BE 0.016 INCH THICK DIE SHAPED FITTING COVERS WITH FACTORY ATTACHED PROTECTIVE LINER. METAL JACKET BANDS TO BE 3/8" WIDE, 0.015 THICK ALUMINUM.
9. INSTALL DOMESTIC WATER PIPING IN ACCORDANCE WITH ASME B31.9.
10. WATER PIPING SHALL BE DISINFECTED AND TESTED IN ACCORDANCE WITH AWWA STANDARDS.
11. MAINTAIN MINIMUM SEPARATION OF 1 FT FROM SANITARY SEWER PIPING IN ACCORDANCE WITH 2013 CALIFORNIA PLUMBING CODE.
12. PIPING TO BE HYDROSTATICALLY TESTED IN ACCORDANCE WITH ASME B31.9

PIPING SUPPORT & SPANS

TYPE	SPAN (MAX.)
COPPER $1\frac{1}{2}$" DIA.	9 FEET
COPPER 2" DIA.	11 FEET
STEEL $1\frac{1}{2}$" DIA.	12 FEET
STEEL 2" DIA.	14 FEET
PVC (SCH. 80)	6 FEET

REVISIONS	DRAWN	DATE
85% SUBMITTAL	DA	10/9/13
100% SUBMITTAL	DA	11/11/13
REVISED PER REVIEW COMMENTS	DPW	2/12/2014
100% RESUBMITTAL	DPW	11/20/2014

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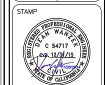
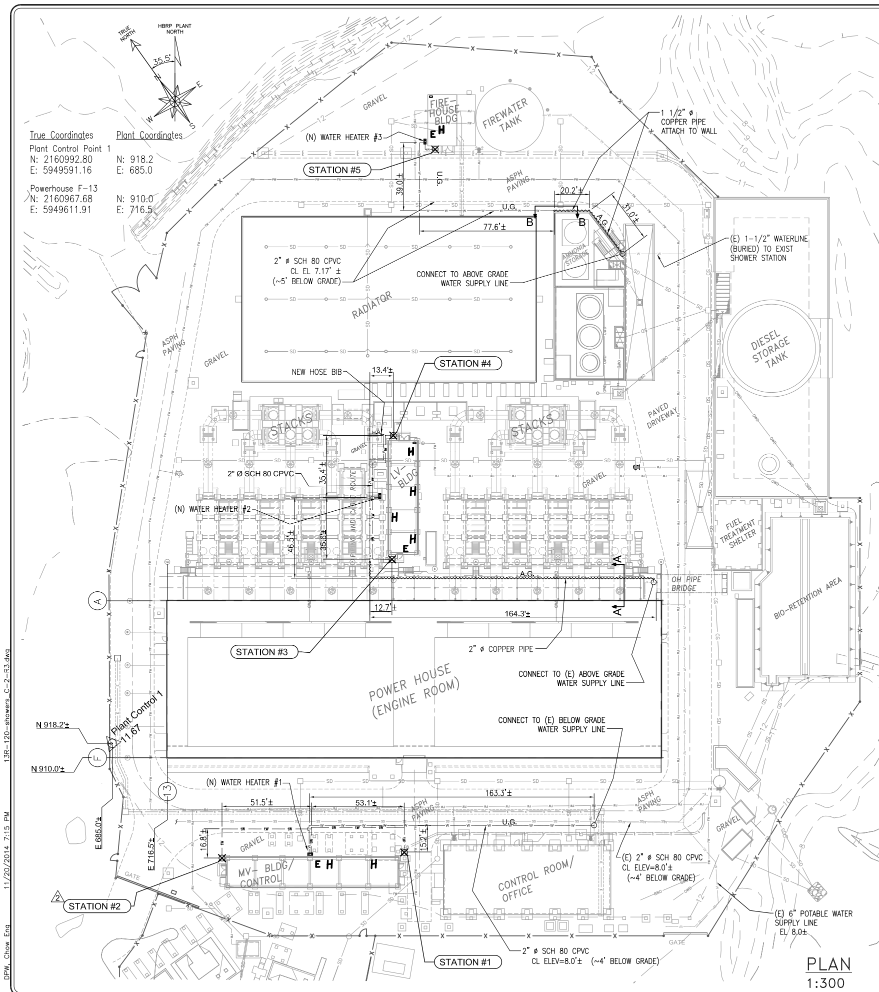
SHEET TITLE: GENERAL NOTES
EMERGENCY EYE WASH
AND SHOWER STATIONS

OWNER: PACIFIC GAS & ELECTRIC COMPANY
1000 KING SALMON AVE.
EUREKA, CA 95503

STAMP


DATE 11/20/14
DRAWN DA
CHECKED DW
JOB NO. 13R-120
SCALE NTS
DRAWING No.
C-1
SHEET No. 2 of 6
REV. R1



PLAN
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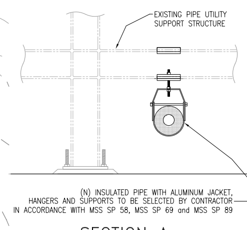
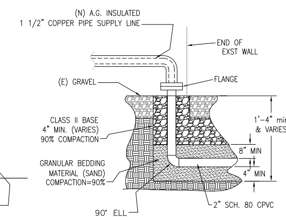
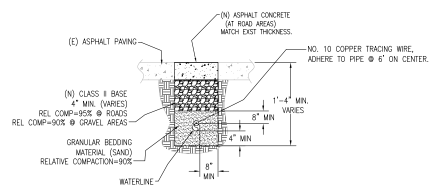


SECTION A



SECTION B



TYPICAL BEDDING DETAIL
FOR WATER PIPING

NOTES:

1. FOR POTABLE WATER NOTES SEE DWG C-1.
2. GRADE ELEVATION IS APPROXIMATELY 12.0' AT EDGE OF PAVED ROAD. SEE FINISH GRADING AND DRAINAGE PLANS REFERENCED DRAWING.
3. EXISTING UTIILITES ARE PARTIALLY SHOWN. FOR UTILITY LOCATIONS AND ELEVATIONS, SEE THE REFERENCE DRAWINGS LISTED BELOW.
4. LOCATIONS OF SHOWER STATIONS, HEATER UNITS AND PIPING ARE APPROXIMATE. FINAL LOCATION TO BE DETERMINED DURING CONSTRUCTION BY APPROVAL BY PG&E.

REFERENCE DRAWINGS:

DBAA405451 & 52,54,55	FINISHED GRADING AND DRAINAGE PLANS, KEY PLAN, DETAIL AND ELEVATIONS.
DBAA405461 & 62,63	UNDERGROUND UTILITY COMPOSITE PLANS AND SECTIONS.
DBAA405464 & 65	POTABLE WATER PLANS (AS BUILTS DATED 2-24-10)
DBAA405467	SANITARY SEWER SITE PLAN (AS BUILTS DATED 2-24-10)
DBAA405468 & 69	OILY WATER SYSTEM PLANS
DBAA407114	UNDERGROUND ELECTRICAL
AS-BUILT VIKING DWG:	FP1 FIREWATER PLAN

LEGEND

H	HAZARD (APPROXIMATE LOCATION)
⊠	NEW EYEWASH/ SHOWER STATION PROXIMITY
E	EXISTING EYEWASH STATION (PORTABLE)
—W—	(N) POTABLE WATERLINE
~~W~~	(N) ABOVE GROUND INSULATED POTABLE WATERLINE
— tW —	(N) POTABLE WATERLINE (TEMPERED WATER)
— W —	(E) POTABLE WATERLINE
— FW —	(E) FIREWATER LINE
— SD —	(E) STORM DRAIN LINES
— SS —	(E) SANITARY SEWER
— X —	(E) FENCE
— E —	(E) ELECTRICAL

	REVISIONS	DRAWN	DATE
–	100% SUBMITTAL	DPW	11/11/13
1	REVISIONS PER REVIEW COMMENTS	DPW	2/12/14
2	REVISIONS PER ADDITIONAL SHOWER	DA	8/25/2014
3	ADD WATER HEATING UNIT		10/30/2014
–	100% RESUBMITTAL	DPW	11/20/2014

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SHEET TITLE: POTABLE WATER PLAN
EMERGENCY EYE WASH
AND SHOWER STATIONS

OWNER: PACIFIC GAS & ELECTRIC COMPANY
1000 KING SALMON AVE.
EUREKA, CA 95503

STAMP
REGISTERED PROFESSIONAL ENGINEER
DEAN WANZEK
C 54717
Exp. 12/31/15
CIVIL
STATE OF CALIFORNIA
11/20/2014

DATE	11/20/14
DRAWN	DA
CHECKED	DW
JOB NO.	13R-120
SCALE	NTS
DRAWING No.	C-2
SHEET No.	3 of 6
REV.	R3

DPW Chow Eng 11/20/2014 7:15 PM 13R-120-showers_C-2-R3.dwg

BFA 902 MCC LOADS

	PANEL: MCC BFA 902		VOLTAGE: 480V, 3W, 3 PHASE, 60 HZ	
	LOCATION: _LV BLDG		1200 AMP BUS	
FEEDER SOURCE: MAIN BUS B- 480 VOLT SWITCHGEAR				
		ENCLOSURE: NEMA		
		MAIN BREAKER AIC SYM:		65000
POSITION #	LOAD DESCRIPTION	LISTED POWER IN KVA UNLESS INDICATED	POWER IN KVA	AMPS PER PHASE
3K	AET 901	5.5	5.5	
3I	AET 903	5.5	5.5	
2S	BJC 901	20.8	20.8	
3Q	BJE 901	91.2	91.2	
2I	BJP 901	17.2	17.2	
4M	BJU 901	2.5	2.5	
4K	BJU 903	2.5	2.5	
3W	BJU 905	2.5	2.5	
4I	**PROPOSED NEW EYEWASH WATER HEATER #1**	**54**	**54**	**65**
4G	**PROPOSED NEW EYEWASH WATER HEATER #2**	**54**	**54**	**65**
2G	BLA 901	83.1	83.1	
4A	BLB 901	139.7	139.7	
4O	**PROPOSED NEW EYEWASH WATER HEATER #3**	**54**	**54**	**65**
3O	BLC 901	5 KW	5.6	
4S	BLI 901	30	30	
2O	BLH 901	8.3	8.3	
2Q	BLH 902	8.3	8.3	
3M	BLK 901	26.6	26.6	
3S	BEY 901.1	7.5	7.5	
1Q	BEY 902.1	7.5	7.5	
1O	BEY 903.1	7.5	7.5	
1K	BEY 904.1	16.6	16.6	
1I	BEY 905.1	16.6	16.6	
1G	BEY 906.1	4.2	4.2	
2M	BFB 901	5.7	5.7	
2K	BFB 903	5.7	5.7	
4Q	BLI 908	45	45	
3C	UVA 901 M001	7.5 HP	6.9	
3E	UVA 901 M002	7.5 HP	6.9	
3G	UVA 901 M003	7.5 HP	6.9	
2U	WR 902	60 A	50	
2W	WR 904	60 A	50	
EXISTING TOTAL			686.3	826.5
PROPOSED + EXISTING TOTAL			**848.3**	**1021.6**

VOLTAGE DROP CALCULATION : EMERGENCY SHOWER/ EYEWASH WATER HEATERS

FOR THREE PHASE CIRCUITS:

Vd=((1.73) x (K) x (L) x (I)) / Cm

Vd = VOLTAGE DROP

K= RESISTANCE (Ohms per circular mil) = 12.9 FOR COPPER

L= ONE WAY CIRCUIT LENGTH IN FEET

I = CURRENT IN AMPS

Cm= CIRCULAR MIL OF CONDUCTOR fom NEC Table 8, Chapter 9

CONDUCTORS SIZED TO LIMIT VOLTAGE DROP TO 3%

MAX ALLOWED VOLTAGE DROP= 14.4 VOLTS

CIRCUIT LENGTHS:

WATER HEATER # 1 = 250'

WATER HEATER # 2 = 100'

WATER HEATER # 3 = 400'

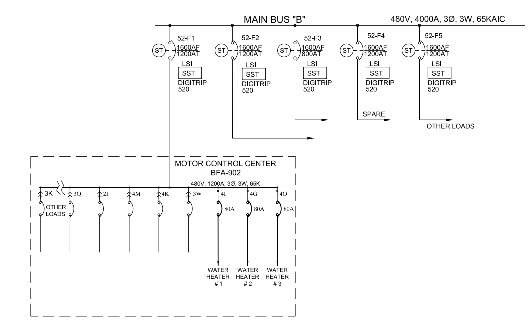
Cm #2 AWG CABLE = 66360 CIRCULAR MILS

I= 65 AMPS

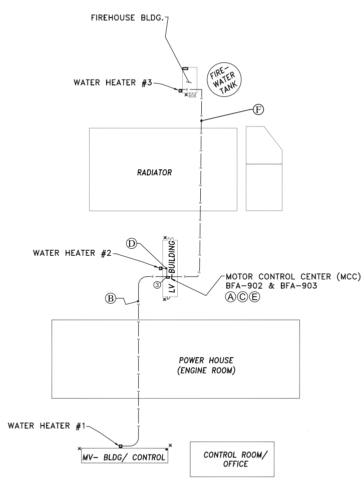
Vd HEATER # 3 (WORST CASE) = 8.74 VOLTS

GENERAL NOTES:

1. ALL INSTALLATIONS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE CALIFORNIA ELECTRICAL CODE AND APPLICABLE PROVISIONS OF THE LOCAL CODES, REGULATIONS AND ORDINANCES.
2. DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENT OF SYSTEM AND WORK. FOLLOW DRAWING IN LAYING OUT WORK AND CHECK DRAWINGS OF OTHER TRADES TO VERIFY SPACE CONDITIONS.
3. WIRES AND CABLES: TYPE TC-ER TRAY CABLE ASSEMBLY CONSISTING OF INSULATED COPPER NO.12 AWG MINIMUM, 600 VOLT, PROVIDE COLOR CODING FOR BRANCH CIRCUIT, POWER, AND CONTROL CONDUCTORS, GREEN FOR GROUNDING CONDUCTORS, AND WHITE FOR NEUTRALS. COLOR OF UNGROUNDED CONDUCTORS TO MATCH THE EXISTING SYSTEM.
4. CONTRACTOR MAY USE EXISTING CABLE TRAY FOR ROUTING OF CONDUCTORS SUBJECT TO SECTION 336 OF CALIFORNIA ELECTRIC CODE.
5. UPON COMPLETION OF WORK, TEST ALL COMPONENTS AND SYSTEMS AS SPECIFIED AND REQUIRED BY THE CODE ENFORCING AUTHORITIES.
6. CHECK ALL FIELD CONNECTIONS PRIOR TO TESTING.
7. TIGHTEN ALL BOLTED CONNECTIONS AND MEGGAR ALL EQUIPMENT AND BUS PRIOR TO TESTING.
8. WIRING: TEST FOR CONTINUITY AND GROUND. MEGGAR TEST ALL FEEDS WITH SWITCHBOARDS AND PANELS CONNECTED, BUT WITH BRANCH LOADS DISCONNECTED. INSULATION RESISTANCE SHALL NOT BE LESS THAN CABLE MANUFACTURER'S RECOMMENDATION.



PARTIAL ELECTRICAL SINGLE LINE DIAGRAMS



ELECTRICAL PLAN

1" = 50'

SHEET NOTES

(A) FURNISH AND INSTALL 80 AMP, THREE-PHASE CIRCUIT BREAKER IN POSITION 4I OF 480 VOLT MOTOR CONTROL CENTER (MCC) BFA-902 IN LV BUILDING.

(B) FURNISH AND INSTALL TYPE TC-ER TRAY CABLE ASSEMBLY CONSISTING OF 3-#2 AWG AND 1-#6 AWG GROUND (OKONITE PART NUMBER 112-10-2874) BETWEEN MCC BFA-902 AND EMERGENCY EYE WASH WATER HEATER #1. ROUTE CABLES WITHIN CABLE TRAY AS MUCH AS POSSIBLE. IN AREAS WHERE NO CABLE TRAY IS PRESENT FURNISH AND INSTALL1.5" RIGID GALVANIZED STEEL (RGS) CONDUIT FOR CONDUCTORS.

(C) FURNISH AND INSTALL 80 AMP, THREE-PHASE CIRCUIT BREAKER WITHIN MCC, BFA-902, POSITION 4G.

(D) FURNISH AND INSTALL TYPE TC-ER TRAY CABLE ASSEMBLY CONSISTING OF 3-#2 AWG AND 1-#6 AWG GROUND (OKONITE PART NUMBER 112-10-2874) BETWEEN MCC BFA-902 AND EMERGENCY EYE WASH WATER HEATER #2. ROUTE CABLES WITHIN CABLE TRAY AS MUCH AS POSSIBLE. IN AREAS WHERE NO CABLE TRAY IS PRESENT FURNISH AND INSTALL1.5" RGS CONDUIT FOR CONDUCTORS.

(E) FURNISH AND INSTALL 80 AMP, THREE-PHASE CIRCUIT BREAKER IN POSITION 4O OF 480 VOLT MOTOR CONTROL CENTER (MCC) BFA-902 IN LV BUILDING

(F) FURNISH AND INSTALL TYPE TC-ER TRAY CABLE ASSEMBLY CONSISTING OF 3-#2 AWG AND 1-#6 AWG GROUND (OKONITE PART NUMBER 112-10-2874) BETWEEN MCC BFA-902 AND EMERGENCY EYE WASH WATER HEATER #3. ROUTE CABLES WITHIN CABLE TRAY AS MUCH AS POSSIBLE. IN AREAS WHERE NO CABLE TRAY IS PRESENT FURNISH AND INSTALL1.5" RGS CONDUIT FOR CONDUCTORS.

REVISIONS: NEW ELECTRICAL SHEET FOR HEATERS; 100 % SUBMITTAL

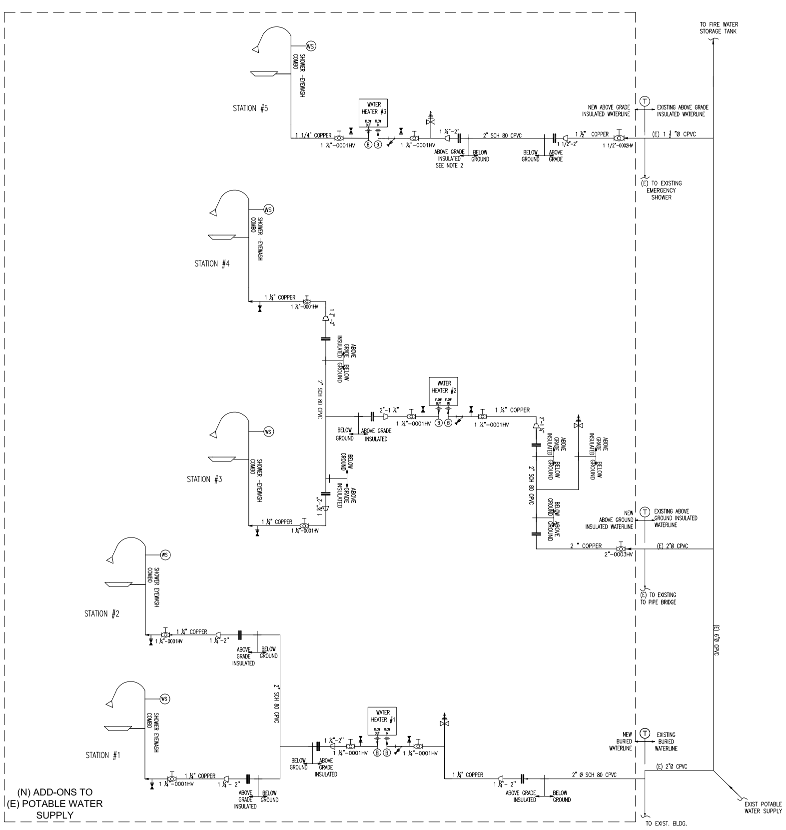
CHOW ENGINEERING, INC.
7770 PARDEE LANE, SUITE 100
OAKLAND, CA 94621

SHEET TITLE: ELECTRICAL SINGLE LINE DIAGRAM EMERGENCY EYE WASH AND SHOWER STATIONS

OWNER: PACIFIC GAS & ELECTRIC COMPANY 1000 KING SALMON AVE. EUREKA, CA 95503

STAMP

DATE	11/20/14
DRAWN	DW
CHECKED	BT
JOB NO.	13R-120
SCALE	NTS
DRAWING No.	E-1
SHEET No.	6 of 6
REV.	R1



PIPING AND INSTRUMENT DIAGRAM (P&ID)

LEGEND

- CHECK VALVE
- WS — WIRELESS REMOTE SENSOR
- T — (N) TO (E) CONNECTION POINT
- HAND BALL VALVE
- 3 WAY BALL VALVE
- REDUCER
- HOSE BIB
- FLANGE
- B — BLEED PORT PLUG VALVE
- TAP W/ BLOCK VALVE (1/4" QUICK RELEASE) SEE NOTE 4
- 1 1/4" DIELECTRIC UNION
- Y STRAINER

NOTES

1. SAFETY SHOWER MONITORING SYSTEM WITH WIRELESS REMOTE SENSORS TO BE PROVIDED AND INSTALLED BY OTHERS.
2. INSULATE AND JACKET ALL ABOVEGROUND PIPING AND VALVES, INCLUDING SHOWER AND HEATING UNITS. SEE POTABLE WATER NOTES ON DWG C-1.
3. HAND OPERATED VALVES IN THE SUPPLY LINE TO THE SHOWER/ EYEWASH UNITS SHALL BE LOCKED IN THE OPEN POSITION AT ALL TIMES. ALTERNATIVELY, THE HANDLES ARE TO BE REMOVED AND STORED FOR MAINTENANCE PURPOSES ONLY.
4. QUICK RELEASE TAP IS FOR PORTABLE PRESSURE GAGE. CONFIRM TYPE, SIZE AND LOCATION WITH PG&E.

BILL OF MATERIAL

ITEM NO.	ITEM	UNIT / MODEL	QYT.
1	EMERGENCY SHOWER / EYEWASH COMB.	HAWS 8300.158	5
2	INSTANTANEOUS WATER HEATER	HAWS 9327	3
3	1 $\frac{1}{4}$" DIELECTRIC UNION	2 EA HEATER	6
4	1 1/4" HAND OPERATED BALL VALVE	1 $\frac{1}{4}$" - 0001HV	10
5	1 1/2" HAND OPERATED BALL VALVE	1 $\frac{1}{2}$" - 0002HV	1
6	2" HAND OPERATED BALL VALVE	2" - 0003HV	1
7	HOSE BIB	-	3
8	TAP W/ BLOCK VALVE	$\frac{1}{4}$" QUICK RELEASE	10
9	Y STRAINER	1 EA HEATER	3
10	WIRELESS REMOTE SENSOR	BY OTHERS	5

REVISIONS	DRAWN	DATE
85% SUBMITTAL		10/9/13
100% SUBMITTAL		11/11/13
1 RESUBMITTAL	DPW	2/12/14
2 REVISIONS PER ADDITIONAL SHOWER	DA	8/25/14
3 ADD WATER HEATING UNIT		10/31/2014
100 % SUBMITTAL		11/20/2014

CHOW ENGINEERING, INC.
7770 PARDEE LANE, SUITE 100
OAKLAND, CA 94621
Phone: (510) 636-8500 Fax: (510) 636-8544
Web: www.choweng.com E-Mail: info@choweng.com

SHEET TITLE: PIPING & INSTRUMENT DIAGRAM EMERGENCY EYE WASH AND SHOWER STATIONS

OWNER: PACIFIC GAS & ELECTRIC COMPANY
1000 KING SALMON AVE.
EUREKA, CA 95503

STAMP
REGISTERED PROFESSIONAL ENGINEER
DEAN WANZEK
C 54717
Exp. 12/31/15
CIVIL
STATE OF CALIFORNIA

DATE	11/20/14
DRAWN	DA
CHECKED	DW
JOB NO.	13R-120
SCALE	NTS
DRAWING No.	M-1
SHEET No.	4 of 6
REV.	R3

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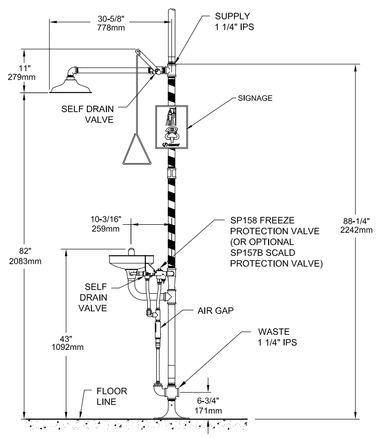


NOTES:
1. DIMENSIONS MAY VARY BY ± 1/2 INCH [13mm].
2. TO COMPLY WITH ANSI Z358.1-2009 FOR EMERGENCY EYEWASH OR EYE/FACE WASH AND SHOWER EQUIPMENT:
   - UNIT SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND ACCEPTABLE PLUMBING PRACTICES.
   - EYEWASH OR EYE/FACE WASH SHALL BE POSITIONED WITH NOZZLES NOT LESS THEN 83.8 CM (33 IN.) AND NO GREATER THAN 114.3 CM (45 IN.) FROM SURFACE ON WHICH USER STANDS AND 15.3 CM (6 IN.) MINIMUM FROM WALL OR NEAREST OBSTRUCTION.
   - SHOWER SHALL BE POSITIONED SO THAT SHOWER HEAD IS NOT LESS THAN 208.3 CM (82 IN.) NOR MORE THAN 243.8 CM (96 IN.) FROM SURFACE ON WHICH USER STANDS.
   - SHOWER SPRAY PATTERN SHALL HAVE A MINIMUM DIAMETER OF 50.8 CM (20 IN.) AT 152.4 CM (60 IN.) ABOVE SURFACE ON WHICH USER STANDS, AND CENTER OF SPRAY PATTERN SHALL BE LOCATED AT LEAST 40.6 CM (16 IN.) FROM ANY OBSTRUCTION.

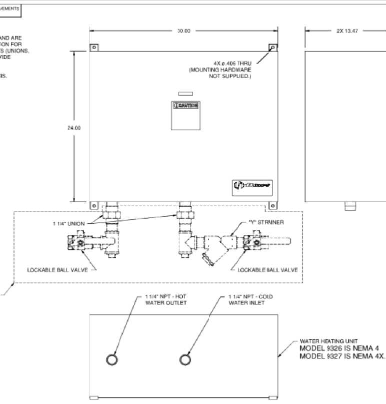
Haws® 1455 KLEPPE LANE, SPARKS, NEVADA 89431, (775) 359-4712 FAX (775) 359-7424, E-MAIL: HAWS@HAWSCO.COM, WEBSITE: WWW.HAWSCO.COM

ECN NO. ECN 4750 / REVISED PER ECN / BY: VWC; DRAWN: CH / DATE: 07/01 / CHK'D; APPROVED: / DATE:	MODEL(S) 8300.158 SHOWER EYEWASH COMBO	PART NUMBER 0002080167.D; DRAWING NO. 09562A00; REV 11
SCALE: 1:16	DRAWING TYPE: INSTALLATION	SIZE: A SHEET 1 OF 1

THIS DOCUMENT IS TRUE AND CORRECT AT TIME OF PUBLICATION. CONTINUED PRODUCT IMPROVEMENTS MAKE SPECIFICATIONS AND MEASUREMENTS SUBJECT TO CHANGE WITHOUT NOTICE.

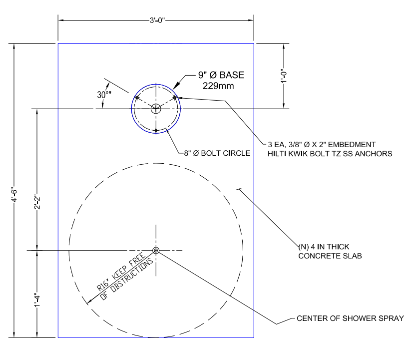
NOTES: (UNLESS OTHERWISE SPECIFIED)

1. ITEMS SHOWN DASHED (IN BOX) ARE SHOWN FOR REFERENCE ONLY AND ARE NOT SUPPLIED. MANUFACTURER REQUIRES "Y" STRAINER INSTALLATION FOR UNIT DEBRIS PROTECTION AND WARRANTY COVERAGE. OTHER PARTS (UNIONS, PLUGS, FULL-FLOW BALL VALVES, ETC., ARE RECOMMENDED TO PROVIDE FUTURE SERVICEABILITY.
2. REFER TO EEMAX OWNER'S MANUAL FOR INSTALLATION INSTRUCTIONS.

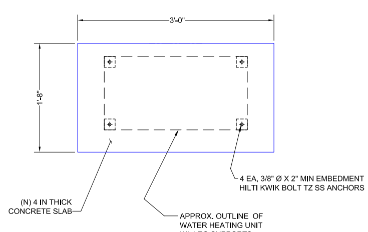


Haws® 1455 KLEPPE LANE, SPARKS, NEVADA 89431, (775) 359-4712 FAX (775) 359-7424, E-MAIL: HAWS@HAWSCO.COM, WEBSITE: WWW.HAWSCO.COM

ECN NO. 4886 / REVISED PER ECN / BY:; DRAWN: VWC / DATE: 1-30-14 / CHK'D:; APPROVED: / DATE:	MODEL(S) 9326, 9327 INSTANTANEOUS HEATER	PART NUMBER 0002080089.D; DRAWING NO. 16308A; REV 0
SCALE: NA	DRAWING TYPE: INSTALLATION	SIZE: A SHEET 1 OF 1



STATION BASE DETAIL



HEATER BASE DETAILS

NOTES:

1. DIMENSIONS MAY VARY BY ± 1/2 INCH [13mm].
2. UNITS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND ACCEPTABLE PLUMBING PRACTICES.
3. DO NOT USE REGULAR PIPE SEALANT. IF NECESSARY USE DOW CORNING 832 SEALANT PLACING 5 SMALL BEADS ON THE MALE THREADS, JUST ABOVE THE FIRST THREAD.
4. CONTRACTOR TO VERIFY ALL DIMENSIONS.
5. ANY DISCREPANCIES WILL BE BROUGHT TO THE ENGINEER FOR REVIEW.
6. CONTRACTOR TO USE PIPE HANGERS AND SEISMIC BRACING AS SPECIFIED BY THE CURRENT CALIFORNIA BUILDING CODE AND THE CALIFORNIA PLUMBING CODE.
7. EMERGENCY SHOWERS AND EYEWASH FACILITIES SHALL MEET THE REQUIREMENTS OF CCR TITLE 8, SECTION 5162, NFPA 99 CHAPTER 10, AND ANSI Z358.1 AND SHALL BE INSTALLED IN ACCORDANCE WITH ANSI Z358.1.8, CCR 5125, NFPA 99 CHAPTER 10.
8. EYEWASH OR EYE/FACE WASH SHALL BE POSITIONED WITH NOZZLES NOT LESS THEN 83.8 CM (33 IN.) AND NO GREATER THAN 114.3 CM (45 IN.) FROM SURFACE ON WHICH USER STANDS AND 15.3 CM (6 IN.) MINIMUM FROM WALL OR NEAREST OBSTRUCTION.
9. SHOWERS SHALL SUPPLY POTABLE WATER AT A MINIMUM FLOW RATE OF 30 GPM AND SHALL BE SUPPLIED BY PIPE WITH A DIAMETER OF AT LEAST 1 INCH.
10. SHOWER SPRAY PATTERNS SHALL BE A MINIMUM OF 20 INCHES IN DIAMETER AT A HEIGHT OF 60 INCHES ABOVE THE SURFACE ON WHICH THE USER STANDS.
11. THE CENTER OF THE SHOWER SPRAY PATTERN SHALL BE LOCATED AT LEAST 16 INCHES FROM ANY OBSTRUCTION.
12. THE MANUAL ACTUATOR SHALL BE FREE FROM OBSTRUCTION FOR 18 TO 24 INCHES IN ALL DIRECTIONS. THE ACTUATOR SHALL NOT BE MOUNTED FLUSH OR RECESSED WITHIN ANY CONSTRUCTED SURFACES OR PARTITIONS.
13. THE WATER SUPPLY TO SHOWERS AND/OR SHOWER/EYEWASH COMBINATION UNITS SHOULD BE CONTROLLED BY A BALL-TYPE SHUTOFF VALVE WHICH IS VISIBLE AND ACCESSIBLE TO SHOWER TESTING PERSONNEL IN THE EVENT OF LEAKING OR FAILED SHOWER HEAD VALVES
14. ELECTRICAL APPARATUS, TELEPHONES, THERMOSTATS, OR POWER OUTLETS SHOULD NOT BE LOCATED WITHIN 18 INCHES OF EITHER SIDE OF THE EMERGENCY SHOWER OR EMERGENCY EYEWASH FACILITY (I.E., A 36-INCH CLEARANCE ZONE)
15. THE EMERGENCY SHOWER LOCATION MUST HAVE A LEVEL SURFACE BENEATH THE SHOWER HEAD. THE FLOOR IMMEDIATELY BENEATH THE EYEWASH AND EMERGENCY SHOWER, AND TO A RADIUS OF BETWEEN ABOUT 12-30 INCHES, SHALL BE A DISTINCTIVE PATTERN AND COLOR TO FACILITATE PROMOTING A CLEAR PATH OF ACCESS.
16. EMERGENCY EYEWASH AND SHOWER LOCATIONS SHALL BE IDENTIFIED WITH A HIGHLY VISIBLE SIGN. THE AREAS AROUND THE EYEWASH OR SHOWER SHALL BE WELL LIGHTED AND HIGHLY VISIBLE.
17. THE EMERGENCY SHOWER AND EYEWASH COMBINATION UNIT SHALL BE HAWS MODEL 8300.158. AND SHALL HAVE AN AXION MSR" HYDRODYNAMIC SHOWERHEAD, STAINLESS STEEL 11" ROUND BOWL, STAINLESS STEEL EYEWASH YOKE ASSEMBLY WITH GREEN SOFT-FLO ABS PLASTIC EYEWASH ANTI-SURGE HEADS WITH INTEGRAL FLOW CONTROLS AND DUST COVERS, CHROME-PLATED BRASS STAY-OPEN SHOWER AND EYEWASH BALL VALVES EQUIPPED WITH STAINLESS STEEL BALL AND STEM, AND AUTOMATIC THERMAL ACTUATOR FREEZE PROTECTION BLEED VALVE THAT WILL START TO OPEN WHEN THE WATER TEMPERATURE FALLS BELOW 40° F AND FULLY OPENS AT 35° F (1.7° C), WILL START TO CLOSE AT 38° F (3.3° C) WITH IT FULLY CLOSING AT 45°F (7.2° C). UNIT SHALL ALSO INCLUDE POWDER-COATED CAST-IRON 9" (22.9 CM) DIAMETER FLOOR FLANGE, UNIVERSAL SIGN, SELF-ADHESIVE HIGH VISIBILITY SAFETY GREEN AND BRIGHT YELLOW STRIPES, AND 1-1/4" IPS SUPPLY.
18. THE PARABOLIC HEAT DESIGN TANKLESS HEATER UNIT SHALL BE HAWS MODEL 9327 WITH FREE STANDING LEGS, DISCONNECT SWITCH, AND GROUND FAULT PROTECTION. VOLTAGES & kW SHALL BE 480v 3ø 54kW. ENCLOSURE TO BE STAINLESS STEEL NEMA 4X RATED, WATERPROOF, CORROSION-RESISTANT, AND INSULATED.
19. INSULATE ABOVE GROUND PIPING INCLUDING PIPING ON EMERGENCY SHOWER UNITS AND HEATER UNITS.

REVISIONS	DRAWN	DATE
85% SUBMITTAL		11/11/13
100% SUBMITTAL	DPW	2-12-14
RENAMED TO MECH SHEET M2		
ADD WATER HEATING UNIT		10/30/2014
100% RESUBMITTAL	DPW	11/20/2014

CHOW ENGINEERING, INC.
7770 PARDEE LANE, SUITE 100
OAKLAND, CA 94621
Phone: (510) 636-8500 Fax: (510) 636-8544
Web: www.chowengineering.com E-Mail: info@choweng.com

SHEET TITLE: STATION DETAILS EMERGENCY EYE WASH AND SHOWER STATIONS

OWNER: PACIFIC GAS & ELECTRIC COMPANY, 1000 KING SALMON AVE., EUREKA, CA 95503

STAMP: REGISTERED PROFESSIONAL ENGINEER DEAN WANZEK C 54717 Exp. 12/31/15 CIVIL STATE OF CALIFORNIA 11/20/2014

DATE	11/20/14
DRAWN	DA
CHECKED	DW
JOB NO.	13R-120
SCALE	NTS
DRAWING No.	M-2
SHEET No.	5 of 6
REV.	R3

Appendix B
Construction Emission Calculations

Appendix B - Construction Emission Calculations

Criteria Pollutant Summary

	ROG	CO	NOx	SOx	PM_{10}	$PM_{2.5}$
Daily Emissions (lb/day)	0.41	3.60	3.70	5.5E-03	0.20	0.16
Project Emissions (tons/project)	4.5E-03	0.040	0.041	6.1E-05	2.2E-03	1.8E-03

Greenhouse Gas Summary

	CO_2	N_2O	CH_4	CO_2e
Project Emissions (metric tons/project)	5.64	6.5E-04	3.5E-04	5.76

						Emission Rates (g/hp-hr)[c]								Emissions (lb/day)								Emissions (tons/project)						Emissions (metric tons/project)			
Offroad Equipment	Number	Horsepower[a]	Load Factor	Hours per Day[b]	Days[b]	ROG	CO	NOX	SO_2	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	ROG	CO	NOX	SO_2	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2e	ROG	CO	NOX	SO_2	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2e
Mini Excavator	1	50	0.38	8	22	0.83	4.92	4.92	0.01	0.37	0.34	570	0.17	-	0.28	1.65	1.65	0.002	0.13	0.12	191	0.057	0.015	197	3.1E-03	0.018	0.018	2.0E-05	1.4E-03	1.3E-03	1.90	5.7E-04	1.5E-04	1.96
Portable Concrete Mixer	1	3	0.56	8	22	0.66	3.47	4.17	0.01	0.17	0.17	568	0.06	-	0.020	0.10	0.12	0.000	0.005	0.005	16.8	0.002	0.017	22.0	2.2E-04	1.1E-03	1.4E-03	2.6E-06	5.6E-05	5.6E-05	0.17	1.7E-05	1.7E-04	0.22

[a] Equipment horsepower are based on typical construction equipment sizing, as exact specifications were unavailable.

[b] Construction is assumed to take one month, based on the project description with construction activity occuring eight hours per day, five days per week.

[c] Emissions rates developed from CalEEMod Appendix D defaults for 2015, with the exception of N_2O. N_2O emission factors were taken from The Climate Registry Default Emissions Factors Table 13.7 (TCR, 2014) and applied to fuel consumption data from the OFFROAD2011 database for the North Coast Air Basin.

						Emission Rates (g/mi)[a]									Emissions (lb/day)										Emissions (tons/project)										Emissions (metric tons/project)			
Onroad Trips	Vehicle Category	Vehicles/day	Trip Distance[a]	Speed[a]	Days	ROG	CO	NOX	SO_2	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	ROG	CO	NOX	SO_2	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2e	ROG	CO	NOX	SO_2	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2e
Delivery Trucks	Heavy-duty Diesel	4	15	35	22	0.41	2.14	13.2	0.017	0.32	0.24	1790	0.005	4.8E-03	0.054	0.28	1.75	2.2E-03	0.04	0.031	237	6.7E-04	6.3E-04	237	5.9E-04	3.1E-03	0.019	2.4E-05	4.6E-04	3.4E-04	2.36	6.7E-06	6.3E-06	2.37
Construction Worker Commute	Light-duty Truck	10	15	35	22	0.17	4.74	0.56	3.9E-03	0.050	0.022	364	0.016	0.007	0.055	1.57	0.18	1.3E-03	0.02	0.007	120	5.4E-03	2.2E-03	121	6.1E-04	0.017	2.0E-03	1.4E-05	1.8E-04	8.1E-05	1.20	5.4E-05	2.2E-05	1.21

[a] Trip distance and speed for delivery trucks and worker commute assume all round trips will originate from Eureka, CA.

[b] Emissions rates developed from EMFAC2011 for 2015, with the exception of CH_4 and N_2O. CH_4 and N_2O emission factors were taken from The Climate Registry Default Emissions Factors Table 13.5 (TCR, 2014), assuming a 2011 model year.

Ground Disturbance	
Volume (CY)[a]	222
k (PM_{10})	0.35
k ($PM_{2.5}$)	0.053
U (mph)	3.36
Moisture Content (%)	12
CY to Ton conversion	1.26

Emissions of ground disturbance based on CalEEMod Truck Loading and AP-42 Chapter 13.2.4.3

[a] Ground disturbance volume assumes a 2-foot wide trench, 4 feet deep and 600 feet in length for underground piping.

	PM_{10}	$PM_{2.5}$
Emissions (lb/day)	1.5E-02	2.3E-03
Emissions (tons/project)	1.7E-04	2.5E-05

TECHNICAL MEMORANDUM

Humboldt Bay Generating Station Emergency Eyewash & Shower Installation Project

Prepared For: Doug Davy, Ch2M Hill Project Manager
Susan Strachan, Strachan Consulting

Prepared By: Dimitra Zalarvis-Chase, DZC Archaeology and Cultural Resource Consulting

Date: January 27, 2015

Introduction

HBGS is proposing the construction of safety improvement features to the HBGS campus; specifically five emergency eyewash and shower stations and three water heaters. The stations will be located within the perimeter fencing of HBGS, but outside of the present structures. Ground disturbance will be required for this installation.

Serving as the HBGS Cultural Resources Monitor from 2007 to the present, I have extensive first-hand experience in evaluating the cultural resources and stratigraphy associated with HBGS. I have performed these same tasks as the CRS at the adjacent HBPP from 2010 to the present. As a result of my extensive monitoring and observations, I contend there is substantial information regarding site conditions which justify monitoring only within very limited areas of HBGS, and only where excavations have the potential to impact the culturally sensitive strata, the A-Horizon, which has been well documented in prior reports (see References).

Project Description & Location

The proposed project is located where the majority of work was conducted under Phase 2, particularly for the construction of the HBGS structural foundations. Proposed ground disturbance, primarily in the form of trenching, is expected to range from 1-foot, 3-inches to 5-feet below grade. The width of

the excavated trench is expected to be approximately 18-inches to 24-inches in width.

Background

In 2009, CH2M Hill submitted a request to augment CUL-6 of the AFC, which required cultural resource monitoring for all ground disturbance during HBGS construction. The technical memo, written by Clint Helton (CEC approved CRS, CH2M Hill) and myself (CEC approved CRM), presented what had been learned to-date about the site stratigraphy, the degree of soil disturbance, the nature and context of discoveries to-date, and the likelihood of further contact with culturally sensitive strata. As the data presented was substantial and valid, the CEC agreed to augment the monitoring requirements for Phase 2.

In conjunction with the proposed engineering plans, I have utilized data excerpted from that same document to perform this project analysis (See Humboldt Bay Generating Station Project - CUL-6. Proposed Change in Level of Cultural Resource Monitoring. Submitted to Mr. Chris Davis, CEC Compliance Project Manager, from Clint Helton, CRS, CH2M Hill, March 23, 2009.)

> "The HBGS is located within a historic salt marsh east of Buhne Point, an uplifted geologic feature at the edge of Humboldt Bay. An aerial view of an intact salt marsh reveals a mosaic of sloughs and small finger channels which create irregular puzzles of high and low elevations in a vertical profile, as well as irregularly shaped channels across the horizontal profile (Attachment A, Figures 1, 2). These elevations and channels were previously influenced by both tidal and slough over-banking events which caused a continuous environment of erosion and deposition (Attachment A, Figure 3). Buhne Point was composed primarily of C horizon and protruded upwards at the edge of the bay like a big slice of cake turned on its side. As the B horizon eroded away from the point, sometime after the uplift event which created this point, a new organic A horizon formed and was intact historically (Attachment A, Figure 4). So, even in its most natural environ, the strata here are vertically and horizontally irregular. In addition, when PG&E built the first Humboldt plant, they ground down the top thirty feet of Buhne Point and spread it over the A horizon to provide a larger and leveled

footprint on which the plant could be built. Finally, gravel and sand fill were deposited over the entire site as well. These conditions have determined the soil stratigraphy currently observed at the site (Attachment A, Figures 3-6).

HBGS is adjacent to HBPP and both sites have undergone extensive disturbance over the last 50 years including extensive installation of underground utilities, construction of a number of auxiliary support buildings for plant operations and maintenance, the demolition of six buildings and one fuel tank pad, numerous utilities removed via trenching by hand or with a backhoe, large area soil remediation, tree removal, and new utility installation. A majority of these excavations were between 2 and 4 feet deep. A few activities, such as the soil remediation, averaged depths of 6 to 13 feet deep. Substantial excavations were performed for the gas and water line pipe, which bounds a large portion of HBGS. Excavations in for this surrounding line required excavation to a depth of 8 feet and bell holes with a surface circumference of 20 feet at each end. Additionally for the installation of the hydrodynamic separator component, excavations reached depths of 7 feet in an area measuring 10 feet by 10 feet. These activities have resulted in a high degree of disturbance at the site, and have provided a clearer understanding of the site stratigraphy and the location and nature of culturally-sensitive soils.

Three soil horizons are typically viewed at the site; horizons A, B, & C. The A horizon consists of a dark brown soil of organic matter and fine loamy silts. This was the surface level or topsoil exposed during prehistoric and historic times and ranged from 6" to 1.0 m thick. The B horizon consists of a blue clay marine deposit and is part of the historic salt-marsh. The shallowest deposit of B horizon was observed at 6" thick, while other excavations never found the final range of depth for this stratum. Lastly, the C horizon consists of a yellow-tan clay formed during the Holocene period and known here as the Carlotta Formation.

The visibility and presence of the A horizon has varied in profiles observed throughout the site. Sometimes it appears to be absent due to the natural formational processes as previously discussed; in other places it appears to have been graded away completely during construction of the first plant in 1950 (Attachment A, Figure 6). A less common but still discernible profile exhibited the high and low peaks of marsh that had been simply filled in without grading (Attachment A, Figure 5). In this formation, only occasionally, a thin layer (approximately 10cm thick) of the A horizon has been observed. I believe these

observations have yielded valuable information to an assessment of the need for on-going monitoring at the HBGS site.

The few cultural resources discovered during work to-date have been insignificant and addressed under the prescriptive treatment process. Artifacts were located only in the A horizon. All discoveries lacked integrity and were not associated with any discernible features.

The depth at which the A horizon was originally encountered during Phase 1 excavations at different points through the site is illustrated in Figure 7 of the Attachment. These depths were noted during excavation activities that most often resulted in native soil removal, including horizon A, followed by back-filling with imported, non-native gravel and fill. A total of 23 tons (6,656 cubic yards) of native soil was removed from the project site. Therefore, it can be noted that 90% of the trenches and large pit excavation created by Phase 1 utility removal/installation and soil remediation represented in Figure 8 have been filled with graded gravel and river rock. Overall, the site has incurred such expansive sub-surface impacts and imported fill that the likelihood of an undisturbed or extensive intact cultural deposit is now very low within these thirteen identified work areas."

Analysis

The installation of Station No.'s 1 and 2 will require approximately 263.6 linear feet of ground disturbance. Of this length, 163.3-feet of trench will overlay, or be placed immediately adjacent to, existing pipelines. The existing pipelines have a disturbed prism ranging from 18-inches to 48-inches in width and a depth ranging from 4-feet to 8-feet. The remaining 100.3-feet of disturbance will pass through soils that have been disturbed to a depth of 3-feet, 4-inches. The culturally sensitive A Horizon near this location was viewed at a depth of 6-feet, 33-feet SE of Station No.2, and at a depth of 6-feet, 30-feet NE of Station No.1. Therefore the likelihood of intersecting the A Horizon at this location is extremely low.

The installation of Station No.'s 3 and 4 require approximately 121.8 linear feet of ground disturbance, all of which will be placed in a previously disturbed prism. Due to the presence of foundation piles, the pipes cannot be installed

any deeper than 3-feet and must remain within a disturbed prism for linear installation. Additionally, the foundation excavation during Phase 2 (2009) reached a depth of 3-feet, effectively removing the culturally sensitive A Horizon near this location, during which no cultural resources were observed. Therefore, there is no chance of intersecting the A Horizon.

The installation of Station No. 5 requires approximately 116.6 linear feet of ground disturbance. Of the 116.6-feet of disturbance, 97.1-feet of trench will overlay, or be placed immediately adjacent to, existing pipelines. The existing pipelines have a disturbed prism ranging from 18-inches to 48-inches in width and a depth ranging from 4-feet to 6-feet. The remaining 19.5-feet of disturbance will pass through soils that have been disturbed to depths ranging from 2-feet, 8-inches to 3-feet, 7-inches. The culturally sensitive A Horizon near this location was viewed at 6-feet to 7-feet, 30-feet NE of this location. Therefore the likelihood of intersecting the A Horizon at this location is extremely low.

Recommendations

Based on the compiled observations and data, it is my recommendation that cultural resource monitoring is not necessary during the installation of the outdoor Emergency Eyewash/Shower stations at HBGS as there is an extremely low probability of intersecting the A Horizon.

References

CH2M Hill

2011 Humboldt Bay Generating Station Cultural Resources Monitoring Report. On file, California Energy Commission, Sacramento. California.

2009 Humboldt Bay Generating Station Project - CUL-6. Proposed Change in Level of Cultural Resource Monitoring. On file, California Energy Commission, Sacramento. California.

2008 Cultural Resources Monitoring and Mitigation Plan, Humboldt Bay Repowering Project, Humboldt County, California. On file, CH2M Hill, Sacramento, Ca.

2006 Application for Certification, Cultural Resources, Humboldt Bay Repowering Project, Humboldt County, California. On file, CH2M Hill, Sacramento, Ca.

DZC Consulting

2014 Cultural Resources Monitoring Report No.2, September 2013 through March 2014. Humboldt Bay Power Plant Decommissioning, Humboldt County, California. On file, CH2M Hill, Sacramento, Ca.

2013 Cultural Resources Monitoring Report No.1, August 2010 through August 2013. Humboldt Bay Power Plant Decommissioning, Humboldt County, California. On file, CH2M Hill, Sacramento, Ca.

ATTACHMENT A

Figures from Technical Memorandum "*Humboldt Bay Generating Station Project - CUL-6. Proposed Change in Level of Cultural Resource Monitoring"; s*ubmitted to Mr. Chris Davis, CEC Compliance Project Manager, from Clint Helton, CRS, CH2M Hill, March 23, 2009

Attachment A

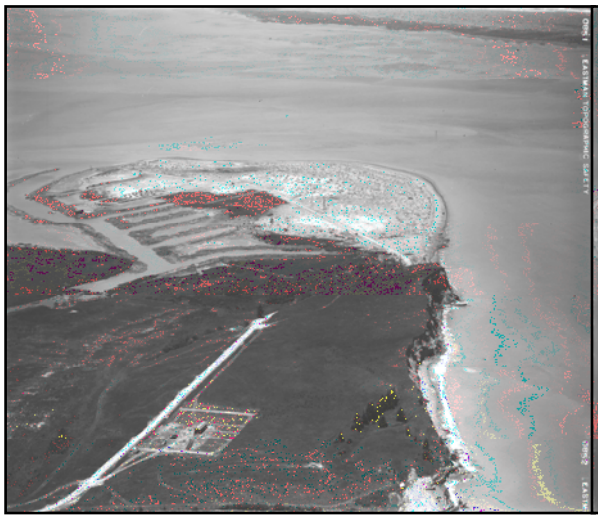


Figure 1. Buhne Point c. 1948: View South.

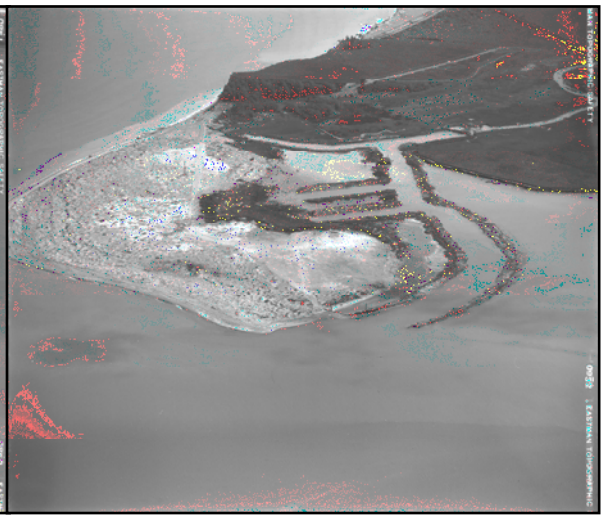


Figure 2. Buhne Point c. 1948: View North.

Figure 3. Type 1. Fill-C-A-B Horizon A (dark brown) is present. Typical of work areas 3, 4, 13, and parts of 6		**Figure 4.** Type 2. Fill-A-C. Horizon A is present. Typical of work areas 4 and 13.	
Figure 5. Type 3. Fill-C-B-C Horizon A is absent. Typical in large portions of work area 8, 2.		**Figure 6.** Type 4. Fill-B-C Horizon A is sporadic, pinched out, or absent due to previous disturbance. Typical of work areas 5, 9, & 10.	

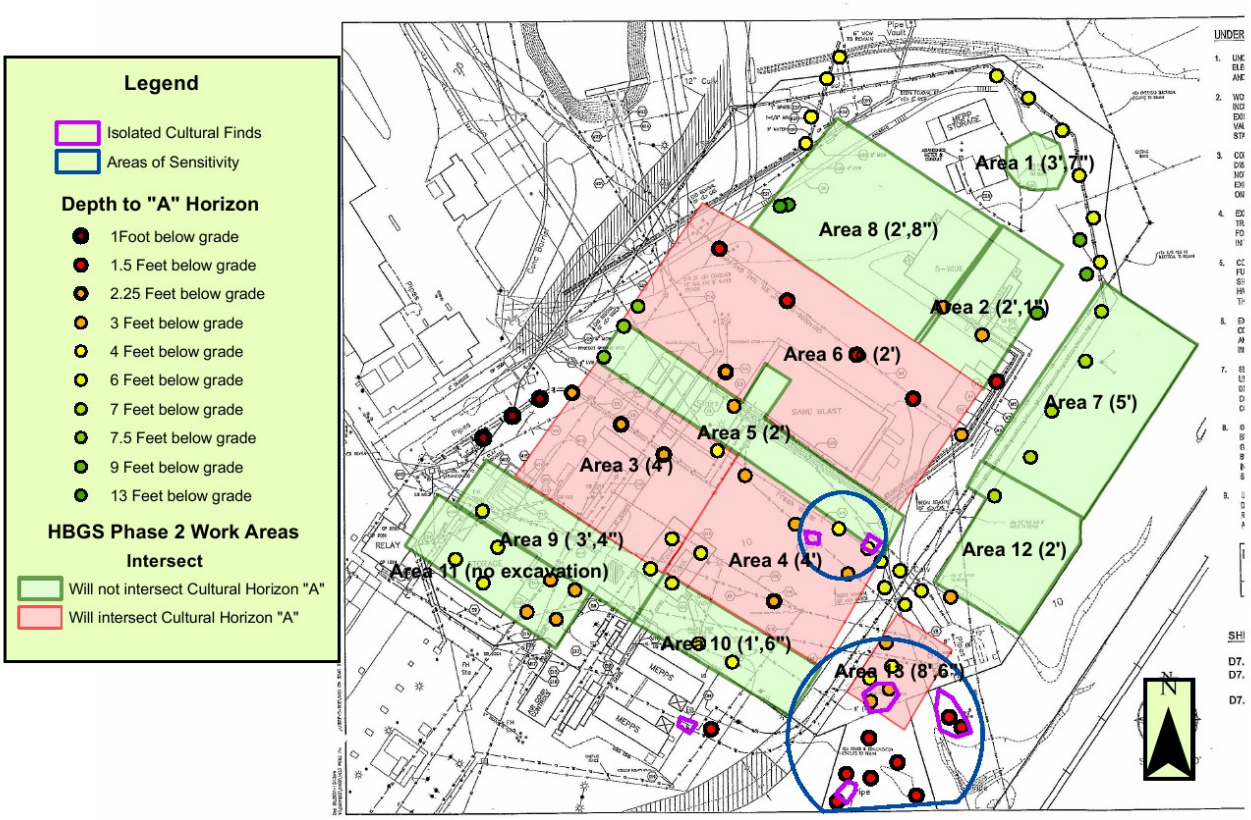


Figure 7. Areas of proposed cultural sensitivity (pink) based on mapping of culturally sensitive "A" horizon, and depths of planned construction activity. Planned maximum construction depths for each Area are shown in parenthesis.

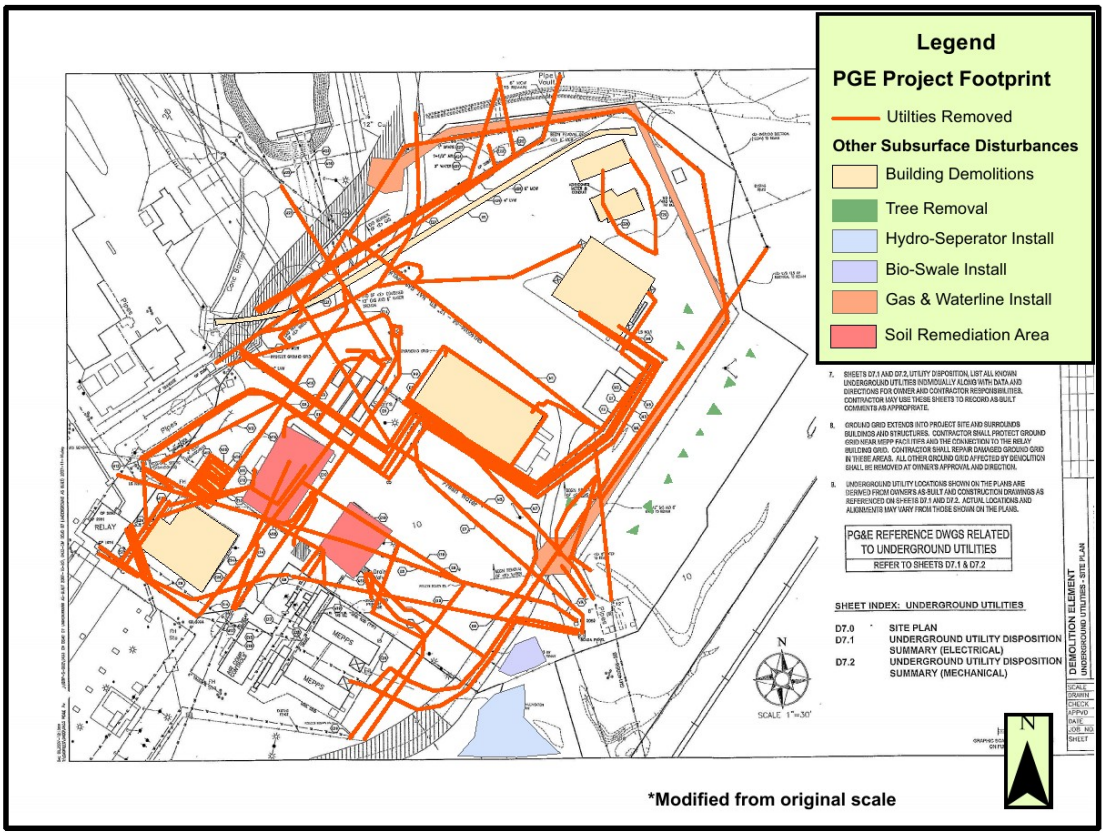
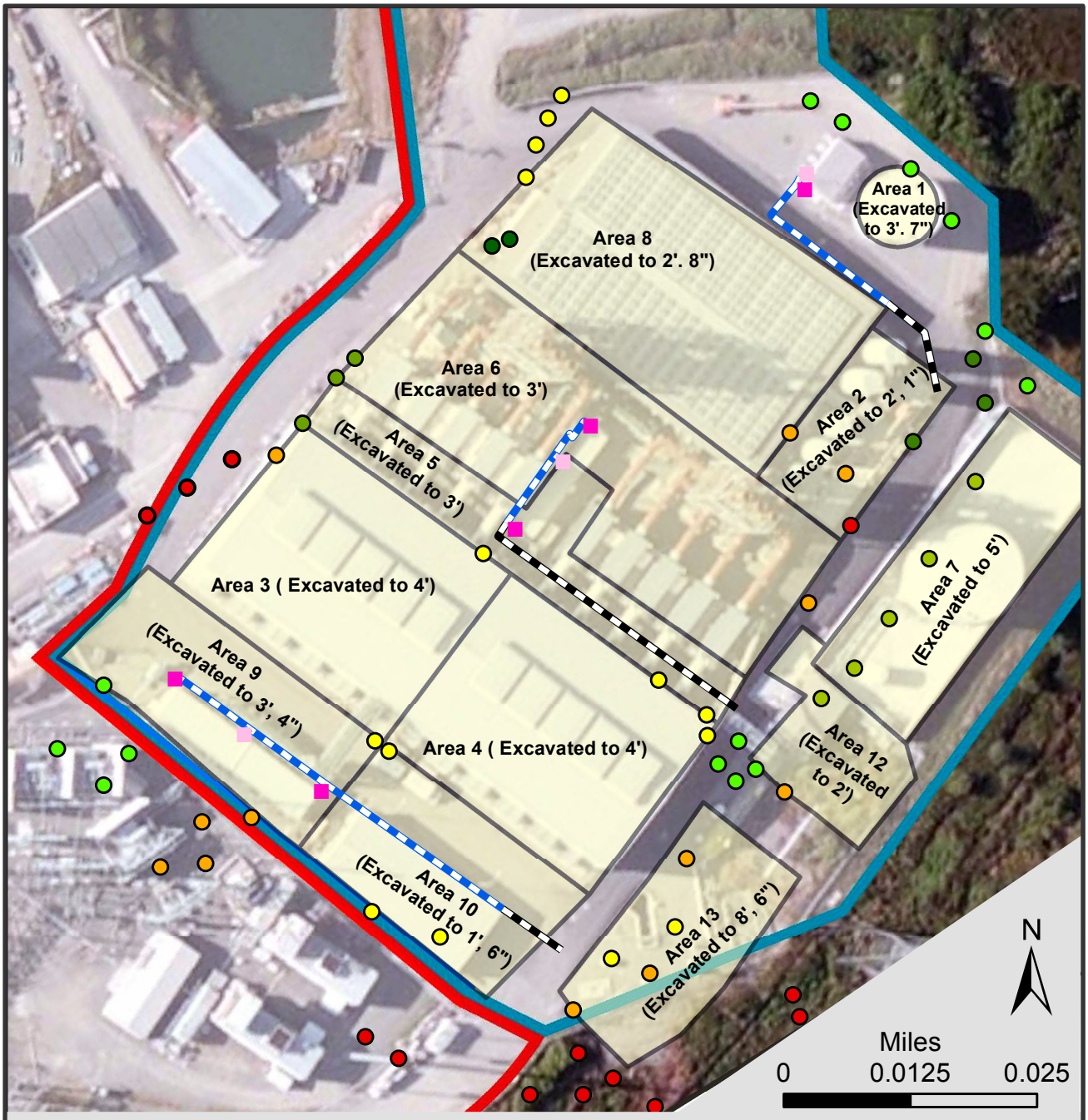


Figure 8. Construction-related subsurface disturbance at HBGS.

ATTACHMENT B



Depth at Intersect with A-Horizon

- 1 foot below grade
- 1.5 feet below grade
- 2.25 feet below grade
- 3 feet below grade
- 4 feet below grade
- 6 feet below grade
- 7 feet below grade
- 7.5 feet below grade
- 9 feet below grade
- 13 feet below grade

HBGS Structural Elements

- HBPP Boundary
- HBGS Boundary
- HBGS Work Area Number and Final Depth of Excavation

Proposed Project Components

- Proposed Eye/Shower Station
- Proposed Water Heater Location
- Existing Water Line
- Proposed Water Line Additions

ATTACHMENT B - FIGURE 1
HBGS Emergency Eye-Wash & Shower Stations
Analysis of Proposed Project and Potential
Intersect with Cultural Resources
(DZC Archaeology & Historic Resource Consulting 2015)