



*Pacific Gas and
Electric Company*[®]

**PG&E Topock
Compressor Station
Needles, California**

Draft Basis of Design Report / Preliminary (30%) Design Submittal for the Final Groundwater Remedy

Appendix D: Plans (Engineering Drawings)

November 2011

CH2MHILL[®]

Equipment Lists for the Final Groundwater Remedy

Equipment List for the Final Remedy: MW-20 Bench and Associated Facilities
 Groundwater Remedy Basis of Design Report
 PG&E Topock Compressor Station, Needles, California

ID or Tag #	Name	Description
MW-20 Bench Carbon Amendment Building		
IRZ00-P1002	Carbon Substrate Pump	Chemical Metering Pump, 30GPH, TDH 200'
IRZ00-P1003	Carbon Substrate Pump	Chemical Metering Pump, 30GPH, TDH 200'
IRZ00-P1004	Carbon Substrate Pump	Chemical Metering Pump, 30GPH, TDH 200'
MW-20 Bench Well Maintenance Building		
IRZ00-P1028	Produced Water Transfer Pump	Centrifugal, 50 GPM, 280' TDH
IRZ00-P1027	Clean-In-Place Recirculation Pump	Centrifugal, 280 GPM, 125' TDH
IRZ00-P1025	Well Maintenance Reagent Pump	Centrifugal, 50 GPM, 200' TDH
IRZ00-P1026	Backflush Jet Pump	Provisional, 100 GPM, 536' TDH
IRZ00-T1022	Well Maintenance Day Tank	1000 Gallon Closed Head Vertical Bulk Storage Poly Tank
IRZ00-T1023	Backwash Jet Pump Surge Tank	Provisional
MW-20 Bench		
IRZ00-T1024	Clean-In-Place Tank	20,000 Gallon Frac Tank
IRZ00-T1001	Carbon Substrate Tank	15,000 Gallon Horizontal Saddle Tank, Double Wall
National Trails Highway IRZ		
IRZ01-P409	Extraction Well Pump	Submersible, 50 GPM, 268' TDH
IRZ01-P410	Extraction Well Pump	Submersible, 50 GPM, 268' TDH
IRZ01-P411	Extraction Well Pump	Submersible, 50 GPM, 268' TDH
IRZ01-P412	Extraction Well Pump	Submersible, 50 GPM, 268' TDH
IRZ05-P409	Extraction Well Pump	Submersible, 50 GPM, 268' TDH
IRZ05-P410	Extraction Well Pump	Submersible, 50 GPM, 268' TDH
IRZ05-P411	Extraction Well Pump	Submersible, 50 GPM, 268' TDH
IRZ05-P412	Extraction Well Pump	Submersible, 50 GPM, 268' TDH
IRZ09-P409	Extraction Well Pump	Submersible, 50 GPM, 268' TDH
IRZ09-P410	Extraction Well Pump	Submersible, 50 GPM, 268' TDH
IRZ09-P411	Extraction Well Pump	Submersible, 50 GPM, 268' TDH
IRZ09-P412	Extraction Well Pump	Submersible, 50 GPM, 268' TDH
IRZ23-P401	Extraction Well Pump	Submersible, 50 GPM, 270' TDH
IRZ23-P402	Extraction Well Pump	Submersible, 50 GPM, 270' TDH
IRZ23-P403	Extraction Well Pump	Submersible, 50 GPM, 270' TDH
IRZ23-P404	Extraction Well Pump	Submersible, 50 GPM, 270' TDH
IRZ11-P428	Backwash Pump	Submersible, 40 GPM, 180' TDH
IRZ11-P429	Backwash Pump	Submersible, 40 GPM, 180' TDH
IRZ11-P430	Backwash Pump	Submersible, 40 GPM, 180' TDH
IRZ11-P431	Backwash Pump	Submersible, 40 GPM, 180' TDH
IRZ13-P428	Backwash Pump	Submersible, 40 GPM, 180' TDH
IRZ13-P429	Backwash Pump	Submersible, 40 GPM, 180' TDH
IRZ13-P430	Backwash Pump	Submersible, 40 GPM, 180' TDH
IRZ13-P431	Backwash Pump	Submersible, 40 GPM, 180' TDH

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ID or Tag #	Name	Description
IRZ		
IRZ15-P428	Backwash Pump	Submersible, 40 GPM, 180' TDH
IRZ15-P429	Backwash Pump	Submersible, 40 GPM, 180' TDH
IRZ15-P430	Backwash Pump	Submersible, 40 GPM, 180' TDH
IRZ15-P431	Backwash Pump	Submersible, 40 GPM, 180' TDH
IRZ16-P428	Backwash Pump	Submersible, 40 GPM, 180' TDH
IRZ16-P429	Backwash Pump	Submersible, 40 GPM, 180' TDH
IRZ16-P430	Backwash Pump	Submersible, 40 GPM, 180' TDH
IRZ16-P431	Backwash Pump	Submersible, 40 GPM, 180' TDH
IRZ17-P428	Backwash Pump	Submersible, 40 GPM, 180' TDH
IRZ17-P429	Backwash Pump	Submersible, 40 GPM, 180' TDH
IRZ17-P430	Backwash Pump	Submersible, 40 GPM, 180' TDH
IRZ17-P431	Backwash Pump	Submersible, 40 GPM, 180' TDH
IRZ19-P428	Backwash Pump	Submersible, 40 GPM, 180' TDH
IRZ19-P429	Backwash Pump	Submersible, 40 GPM, 180' TDH
IRZ19-P430	Backwash Pump	Submersible, 40 GPM, 180' TDH
IRZ19-P431	Backwash Pump	Submersible, 40 GPM, 180' TDH
IRZ20-P428	Backwash Pump	Submersible, 40 GPM, 180' TDH
IRZ20-P429	Backwash Pump	Submersible, 40 GPM, 180' TDH
IRZ20-P430	Backwash Pump	Submersible, 40 GPM, 180' TDH
IRZ20-P431	Backwash Pump	Submersible, 40 GPM, 180' TDH
IRZ21-P428	Backwash Pump	Submersible, 40 GPM, 180' TDH
IRZ21-P429	Backwash Pump	Submersible, 40 GPM, 180' TDH
IRZ21-P430	Backwash Pump	Submersible, 40 GPM, 180' TDH
IRZ21-P431	Backwash Pump	Submersible, 40 GPM, 180' TDH
IRZ25-P421	Backwash Pump	Submersible, 40 GPM, 180' TDH
IRZ25-P422	Backwash Pump	Submersible, 40 GPM, 180' TDH
IRZ27-P421	Backwash Pump	Submersible, 40 GPM, 180' TDH
IRZ27-P422	Backwash Pump	Submersible, 40 GPM, 180' TDH
IRZ29-P421	Backwash Pump	Submersible, 40 GPM, 180' TDH
IRZ29-P422	Backwash Pump	Submersible, 40 GPM, 180' TDH
IRZ31-P421	Backwash Pump	Submersible, 40 GPM, 180' TDH
IRZ31-P422	Backwash Pump	Submersible, 40 GPM, 180' TDH
IRZ33-P421	Backwash Pump	Submersible, 40 GPM, 180' TDH
IRZ33-P422	Backwash Pump	Submersible, 40 GPM, 180' TDH
IRZ35-P421	Backwash Pump	Submersible, 40 GPM, 180' TDH
IRZ37-P421	Backwash Pump	Submersible, 40 GPM, 180' TDH
IRZ39-P421	Backwash Pump	Submersible, 40 GPM, 180' TDH

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ID or Tag #	Name	Description
Inner Loop / Colorado River Extraction Wells		
FP01-P501	Extraction Well Pump	Submersible, 170 GPM, 325' TDH
FP02-P501	Extraction Well Pump	Submersible, 170 GPM, 319' TDH
FP03-P501	Extraction Well Pump	Submersible, 170 GPM, 332' TDH
FP04-P501	Extraction Well Pump	Submersible, 170 GPM, 332' TDH
FP05-P501	Extraction Well Pump	Submersible, 170 GPM, 325' TDH
Inner Loop / Uplands Injection Wells		
UP01-P601	Backwash Pump	Submersible, 400 GPM, 280' TDH
UP02-P601	Backwash Pump	Submersible, 400 GPM, 280' TDH
UP03-P601	Backwash Pump	Submersible, 400 GPM, 280' TDH
UP04-P601	Backwash Pump	Submersible, 400 GPM, 280' TDH

Equipment List for the Final Remedy: Transwestern Metering Station Bench and Associated Facilities
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ID or Tag #	Name	Description
TW Carbon Amendment Room		
TCS00-P904	Carbon Substrate Pump	Chemical Metering Pump, 30 GPH, TDH 150'
TCS00-P905	Carbon Substrate Pump (Back Up)	Chemical Metering Pump, 30 GPH, TDH 150'
TW Well Maintenance Room		
TCS00-P906	Well Maintenance Reagent Pump	Centrifugal, 50 GPM, 150' TDH
TCS00-T902	Well Maintenance Reagent Tote	As Needed
TCS00-T903	Well maintenance Day Tank	1000 Gallon Closed Head Vertical Bulk Storage Poly Tank
TW Misc		
TCS00-T901	Carbon Substrate Tank	3,000 Gallon Horizontal Saddle Tank, Double Wall
Embayment (North East Of TCS)		
MID01-P801	Extraction Well Pump	Submersible, 4 GPM, 313 TDH
MID02-P801	Extraction Well Pump	Submersible, 3 GPM, 312 TDH
MID03-P801	Extraction Well Pump	Submersible, 1.5 GPM, 311' TDH
MID04-P801	Extraction Well Pump	Submersible, 2 GPM, 311' TDH
East Ravine		
RAV01-P701	Extraction Well Pump	Submersible, 1.5 GPM, 300' TDH
RAV02-P701	Extraction Well Pump	Submersible, 1.5 GPM, 300' TDH
RAV03-P701	Extraction Well Pump	Submersible, 1.5 GPM, 300' TDH
RAV04-P701	Extraction Well Pump	Submersible, 1.5 GPM, 300' TDH
TCS Area		
TCS01-P931	Backwash Injection Well Pump	Submersible, 40 GPM, 240' TDH
TCS01-P932	Backwash Injection Well Pump	Submersible, 40 GPM, 240' TDH
TCS02-P931	Backwash Injection Well Pump	Submersible, 40 GPM, 240' TDH
TCS02-P932	Backwash Injection Well Pump	Submersible, 40 GPM, 240' TDH

Equipment List for the Final Remedy: Freshwater Injection Wells
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ID or Tag #	Name	Description
FW-INJ-1	Freshwater Injection Well	12" dia. 300 to 400 feet deep
P-001	Backwash well pump	Submersible, 400 gpm, 275' TDH
FV-001	Flow control valve	Pressure reducing valve - hydraulic type
FW-INJ-2	Freshwater Injection Well	12" dia. 300 to 400 feet deep
P-002	Backwash well pump	Submersible, 400 gpm, 276' TDH
FV-001	Flow control valve	Pressure reducing valve - hydraulic type
FW-INJ-3	Freshwater Injection Well	Future
P-003	Backwash well pump	Future
FV-001	Flow control valve	Future
FW-INJ-4	Freshwater Injection Well	12" dia. 300 to 400 feet deep
P-004	Backwash well pump	Submersible, 400 gpm, 204' TDH
FV-001	Flow control valve	Pressure reducing valve - hydraulic type
HWR-1	Freshwater Supply Well	Existing - No tag
Topock 2	Freshwater Supply Well (Secondary)	Existing - No tag
Topock 3	Freshwater Supply Well (Secondary)	Existing - No tag

Equipment List for the Final Remedy: Remedy Wastewater Treatment Plant
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ID or Tag #	Name	Description
T-401	Influent Storage Tank #1	500 bbl Frac tank equipped with wheels and mixers for pH adjustment
T-402	Influent Storage Tank #2	500 bbl Frac tank equipped with wheels
T-403	Influent Storage Tank #3	500 bbl Frac tank equipped with wheels
T-404	Influent Storage Tank #4	500 bbl Frac tank equipped with wheels
P-401	Filter Feed Pump	Centrifugal pump, 35 gpm, 185' TDH
P-402	Filter Feed Pump	Centrifugal pump, 35 gpm, 185' TDH (standby)
F-405A	Cartridge Filter Coarse 1	Package duplex filter with hurricane type housing rated for 35 gpm minimum
F-405B	Cartridge Filter Fine 1	capacity.
F-406A	Cartridge Filter Coarse 2	Package duplex filter with hurricane type housing rated for 35 gpm minimum
F-406B	Cartridge Filter Fine 2	capacity. Standby
T-407	Treated Water Tank #1	500 bbl Frac tank equipped with wheels
T-408	Treated Water Tank #2	500 bbl Frac tank equipped with wheels
P-501	Truck Loading Pump	Located at TCS Truck Fill Station. 150 gpm at 90' TDH
P-502	Truck Loading Pump	Located at MW-20 Bench Truck Fill Station. 150 gpm at 90' TDH
PS-601	Phase Separator	Gravity separator with filter fabric mounted on support inside 20 cy dumpster
PS-602	Phase Separator	Gravity separator with filter fabric mounted on support inside 20 cy dumpster
P-621	Caustic Feed Pump	Chemical metering pump for 25% caustic feed
P-622	Caustic Feed Pump	Chemical metering pump for 25% caustic feed
T-620	Caustic Storage Tank	500 gallon HDPE tank with integral double containment

TOPOCK GROUNDWATER REMEDIATION PROJECT

PG&E TOPOCK COMPRESSOR STATION

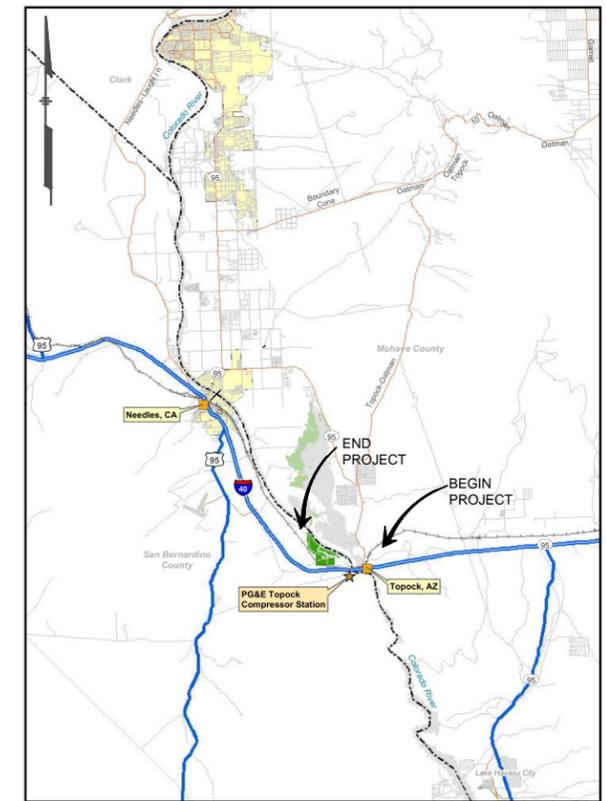
NEEDLES, CALIFORNIA

PRELIMINARY PLANS

NOVEMBER 2011



VICINITY MAP
NTS



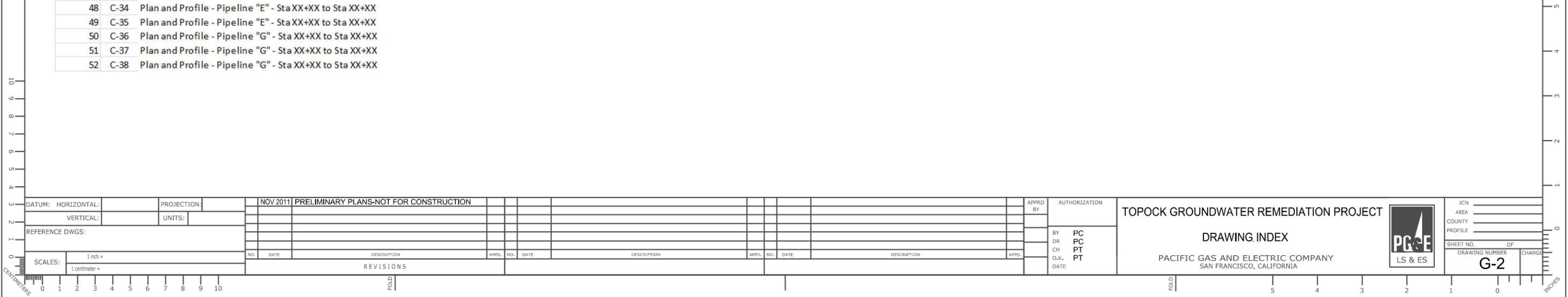
LOCATION MAP
NTS

DATUM: HORIZONTAL:		PROJECTION:		NOV 2011 PRELIMINARY PLANS-NOT FOR CONSTRUCTION		APPRD BY:		AUTHORIZATION		TOPOCK GROUNDWATER REMEDIATION PROJECT			JCN AREA COUNTY PROFILE SHEET NO. OF DRAWING NUMBER OF CHANGE G-1				
VERTICAL:		UNITS:								TITLE SHEET , VICINITY MAP AND LOCATION MAP							
REFERENCE DWGS:								BY: PC									
								DR: PC									
								O.K.: PT									
								DATE:									
SCALES:		1 inch =		NO.		DATE		DESCRIPTION		APPRD.		NO.		DATE		DESCRIPTION	
		1 centimeter =		REVISIONS													

SHT NO.	DWG NO	TITLE
1	G-1	Title Sheet, Vicinity Map and Location Map
2	G-2	Drawing Index
3	G-3	Abbreviations
4	G-4	Legend and Symbols
5	G-5	Process Schematic for Fresh Water Injection and Remedy-produced Water
6	G-6	Process Schematic for Remedy-produced Water Conditioning Plant
7	G-6A	Mass Balance Sheet - Remedy-produced Water Conditioning Plant
8	G-7	Process Flow Schematics NTH IRZ Extraction Well Network
9	G-8	Process Flow Schematic Inner Recirculation Loop
10	G-9	Process Flow Schematic Carbon Substrate Amendment and Clean-in-Place Systems
11	G-10	Process Flow Schematic NTH IRZ Injection Well Network
12	G-11	Process Flow Schematic TW Bench Treatment System
13	G-12	Hydraulic Profile Freshwater Injection System
14	G-13	Hydraulic Profile Remedy-produced Water Conditioning Plant
15	C-1	General Notes
16	C-2	Well Location Map
17	C-3	Well Schedule
18	C-4	Pipeline Key Map
19	C-5	Pipeline Segment Map
20	C-6	Pipe Schedule
21	C-7	Typical Trench Detail
22	C-8	Overall Civil Site Plan
23	C-9	NTH IRZ Carbon Amendment Area Plan
24	C-10	TW Bench Carbon Amendment Area Plan
25	C-11	Plan and Profile - Pipeline "A" - Sta 10+00 to Sta 22+00
26	C-12	Plan and Profile - Pipeline "H" - Sta 10+00 to Sta 15+43, Pipeline "A" - Sta 22+00 to Sta 29+00
27	C-13	Plan and Profile - Pipeline "A" - Sta 29+00 to Sta 42+00
28	C-14	Plan and Profile - Pipeline "A" - Sta 42+00 to Sta 53+00
29	C-15	Plan and Profile - Pipeline "A" - Sta 53+00 to Sta 61+25
30	C-16	Plan and Profile - Pipeline "I" - Sta 10+00 to Sta 15+92
31	C-17	TCS Area Plan 1
32	C-18	TCS Area Plan 2
33	C-19	Plan and Profile - Pipeline "B" - Sta 10+00 to Sta 22+00
34	C-20	Plan and Profile - Pipeline "B" - Sta 22+00 to Sta 34+00
35	C-21	Plan and Profile - Pipeline "B" - Sta 34+00 to Sta 45+50
36	C-22	Plan and Profile - Pipeline "B" - Sta 45+50 to Sta 56+00
37	C-23	Plan and Profile - Pipeline "B" - Sta 56+00 to Sta 68+50
38	C-24	Plan and Profile - Pipeline "B" - Sta 68+50 to Sta 80+43
39	C-25	Plan and Profile - Pipeline "D" - Sta 10+00 to Sta 22+00
40	C-26	Plan and Profile - Pipeline "D" - Sta 22+00 to Sta 28+40
41	C-27	Plan and Profile - Pipeline "J" - Sta 10+00 to Sta 15+83
42	C-28	Plan and Profile - Pipeline "C" - Sta 10+00 to Sta XX+XX
43	C-29	Plan and Profile - Pipeline "C" - Sta XX+XX to Sta XX+XX
44	C-30	Plan and Profile - Pipeline "C" - Sta XX+XX to Sta XX+XX
45	C-31	Plan and Profile - Pipeline "C" - Sta XX+XX to Sta XX+XX
46	C-32	Plan and Profile - Pipeline "F" - Sta XX+XX to Sta XX+XX
47	C-33	Plan and Profile - Pipeline "F" - Sta XX+XX to Sta XX+XX
48	C-34	Plan and Profile - Pipeline "E" - Sta XX+XX to Sta XX+XX
49	C-35	Plan and Profile - Pipeline "E" - Sta XX+XX to Sta XX+XX
50	C-36	Plan and Profile - Pipeline "G" - Sta XX+XX to Sta XX+XX
51	C-37	Plan and Profile - Pipeline "G" - Sta XX+XX to Sta XX+XX
52	C-38	Plan and Profile - Pipeline "G" - Sta XX+XX to Sta XX+XX

SHT NO.	DWG NO	TITLE
53	A-1	General Architectural Notes and Details
54	A-1A	Overall Architectural Site Plan
55	A-1B	TCS Architectural Site Plan
56	A-1C	Architectural Elevations - North
57	A-1D	Architectural Elevations - West
58	A-3	Operations Building Floor Plan and Elevations
59	A-7	Remedy-produced Water Conditioning Plant Floor Plan and Elevations
60	A-11	Electrical Building Floor Plans and Elevations
61	A-14	MW-20 Bench Carbon Amendment Building Plans and Elevations
62	A-15	MW-20 Bench Well Maintenance Building Plans and Elevations
63	A-16	TW Bench Carbon Amendment Building Plans and Elevations
64	A-17	Electrical Node Building Plans and Elevations
65	A-19	Hazardous Materials Storage Floor Plan
66	A-22	Relocated Maintenance Shop Floor Plan and Elevations
67	A-25	Relocated Pipe Storage Floor Plan
68	S-1	General Structural Notes
69	S-2	General Structural Details
70	S-15	Injection Well and Pipe - Meter Vault - Plan and Sections
71	S-17A	Structural Details Injection Well Vaults
72	S-17B	Structural Sections Injection Well Vaults
73	S-17C	Structural Details Extraction Wells
74	S-17D	Structural Sections Extraction Wells
75	M-1	General Mechanical Notes and Symbols
76	M-7	Remedy-produced Water Conditioning Plan and Sections
77	M-11	Freshwater Injection Well and Meter Vault - Plan and Sections
78	M-11A	Freshwater Injection Well Construction Details
79	M-13A	Injection well construction details
80	M-13B	Injection well construction details
81	M-13C	Extraction well construction details
82	M-13D	Extraction well construction details
83	M-14A	Mechanical Details Injection Well Vaults
84	M-14B	Mechanical Sections Injection Well Vaults
85	M-14C	Mechanical Details Extraction Wells
86	M-14D	Mechanical Sections Extraction Wells
87	M-15	Mechanical Layout NTH IRZ Carbon Amendment Building
88	M-16	Mechanical Layout NTH IRZ Well Maintenance Building
89	M-17	Mechanical Layout TW Carbon Amendment Building
90	M-18	Mechanical Layout Electrical Building

SHT NO.	DWG NO	TITLE
91	E-1	Electrical Symbols and Abbreviations
92	E-2	Overall Electrical Site Plan
93	E-4	Existing Generator Switchboard One-Line Diagram and Elevation
94	E-5	Remedy Power Distribution One-Line Diagram
95	E-6	Single Line Diagram Node 1
96	E-7	Single Line Diagram Main Control Building
97	E-8	Single Line Diagram Node 3
98	E-9	Single Line Diagram Node 4
99	E-10	Single Line Diagram Node 6
100	E-10A	Total Remedy Load Calculations
101	E-10B	Electrical Loads Schedules
102	E-11	Scada Network Diagram
103	E-21	Electrical Building Plan
104	I-1	Instrumentation Symbols and Abbreviations
105	I-2	Piping and Instrumentation Diagram Legend # 1
106	I-3	Piping and Instrumentation Diagram Legend # 2
107	I-4	Injection Well P & ID
108	I-5	Fresh Water System P & ID
109	I-6	Remedy Produced Water Tank P & ID
110	I-7	Filter System P & ID
111	I-8	Conditioned Water P & ID
112	I-8A	Caustic System and Liquid Phase Separator P & ID
113	I-9	NTH IRZ Extraction Wells P & ID
114	I-10	NTH IRZ Carbon Amendment Building P & ID
115	I-11	NTH IRZ Well Maintenance Building P & ID
116	I-12A	NTH IRZ Injection Wells P & ID
117	I-12B	NTH IRZ Injection Wells P & ID
118	I-13	River Bank Extraction and Upland Injection Wells P & ID
119	I-14	TW Bench Extraction and Injection Wells P & D
120	I-15	TW Bench Carbon Amendment Building P & ID
121	I-15A	Remedy Well ID Schedule
122	I-16	SCADA Block Diagram

DATUM: HORIZONTAL: VERTICAL: REFERENCE DWGS:	PROJECTION: UNITS:	NOV 2011 PRELIMINARY PLANS-NOT FOR CONSTRUCTION	APPR. BY: AUTHORIZATION:	TOPOCK GROUNDWATER REMEDIATION PROJECT DRAWING INDEX PACIFIC GAS AND ELECTRIC COMPANY SAN FRANCISCO, CALIFORNIA		JCN _____ AREA _____ COUNTY _____ PROFILE _____ SHEET NO. _____ OF _____ DRAWING NUMBER G-2 OF _____ CHANGE _____
SCALES: 1 inch = _____ 1 centimeter = _____		REVISIONS:				

STANDARD ABBREVIATIONS

<p>< ANGLE @ AT AB ANCHOR BOLT ABDN ABANDONED ABS ACRYLONITRILE-BUTADIENE-STYRENE AC ASBESTOS CEMENT, ASPHALTIC CONCRETE ACBD ACOUSTICAL BOARD ACI AMERICAN CONCRETE INSTITUTE ACST ACOUSTICAL TILE ACT ACOUSTICAL ACU AIR CONDITIONING UNIT AD AREA DRAIN ADDL ADDITIONAL ADJ ADJACENT, ADJUSTABLE ADPTR ADAPTER AG ABOVE GROUND AGGR AGGREGATE AHR ANCHOR AISC AMERICAN INSTITUTE OF STEEL CONSTRUCTION AL ALUMINUM ALTN ALTERNATE ANDZ ANODIZE ANGZ ANGLE POINT APPROX APPROXIMATE APVD APPROVED APWA AMERICAN PUBLIC WORKS ASSOCIATION ARCH ARCHITECTURAL ARV AIR RELEASE VALVE ASSY ASSEMBLY ASU AIR SUPPLY UNIT AUTO AUTOMATIC AUX AUXILIARY AVG AVERAGE AWG AMERICAN WIRE GAGE</p>	<p>CU FT CUBIC FOOT CU IN CUBIC INCH CU YD CUBIC YARD CULV CULVERT CYL CYLINDER</p> <p>d PENNY (NAIL SIZE) DB DISTRIBUTION BOX DBA DEFORMED BAR ANCHOR DBL DOUBLE DECHLOR DECHLORINATION DET DETAIL DF DOUGLAS FIR DI DROP INLET, DUCTILE IRON DIA DIAMETER DIAG DIAGONAL DIR DRAIN DIL DILUTE DIM DIMENSION DIMJ DUCTILE IRON MECHANICAL JOINT DIMJGL DUCTILE IRON MECHANICAL JOINT, GLASS LINED DIP DUCTILE IRON PIPE DIPFGL DUCTILE IRON PIPE, FLANGED, GLASS LINED DIR DIRECTION DISCH DISCHARGE DISCH DISCHARGE DMU DRAINAGE MANAGEMENT UNIT DML DRAIN DR DRAIN DRWR DRAWER DS DOWNSPOUT DW DRAIN WATER DWG DRAWING DWL DOWEL</p>	<p>E EAST, ELECTRICAL EA EACH EC END CURVE ECC ECCENTRIC EF EACH FACE, EXHAUST FAN EFL EFFLUENT EIR ENVIRONMENTAL IMPACT REPORT ELB ELEVATION ELC ELECTRICAL LOAD CENTER ELEC ELECTRIC, ELECTRICAL EMBED ELECTRIC, ELECTRICAL ENGR ENGINEER EOH ELECTRICAL OVERHEAD EQL EQUAL EQL SP EQUALLY SPACED EQPT EQUIPMENT EQUIV EQUIVALENT ETOH ETHANOL EVC END OF VERTICAL CURVE EW EACH WAY, EXTRACTION WELL EX EXTRACTION EXH EXHAUST EXP EXPLOSION, EXPANSION EXP JT EXPANSION JOINT EXT EXISTING EXT EXTERIOR, EXTERNAL</p>	<p>F F L EL FINISHED FLOOR ELEVATION "F" DEGREE FAHRENHEIT FAB FABRICATION, FABRICATE FACIL FACILITY FBDR FILTER BACKWASH DRAIN FLX FLEXIBLE FCA FLANGED COUPLING ADAPTER FCV FLOW CONTROL VALVE FD FLOOR DRAIN FDA FLOOR DRAIN W/INTEGRAL TRAP FDN FOUNDATION FEXT FIRE EXTINGUISHER FF FINISH FLOOR FG FINISH GRADE FHT FEMALE HOSE THREAD FHY FIRE HYDRANT FIG FIGURE FIPT FEMALE IRON PIPE THREAD FLX FLEXIBLE FLG FLANGE FLH FLAT HEAD FLL FLOW LINE ELEVATION FLR FLOOR FLTR FILTER FNPT FEMALE NATIONAL PIPE THREAD FNISH FINISH FNSH FIBER OPTIC CONDUIT FPC FIXED POINT, FLAT PANEL FRP FIBERGLASS REINFORCED FLOODPLAIN PLASTIC FS FINISH SLAB, FERTIGATION SOLUTION FT FOOT OR FEET FTG FOOTING FW FRESH WATER FWD FORWARD</p>	<p>G GAS GA GAGE, GAUGE GAL GALLON GALV GALVANIZED GALVI GALVANIZED IRON GALVS GALVANIZED (HOT DIP) STEEL GB GRAB BAR, GRADE BREAK GC GROOVED COUPLING GCF GROOVED COUPLING FITTING GL GLASS</p>	<p>GPD GALLONS PER DAY GPH GALLONS PER HOUR GPM GALLONS PER MINUTE GSP GALVANIZED STEEL PIPE GVL GRAVEL GWD GYPSUM WALLBOARD GYP GYPSUM GYP PLAS GYPSUM PLASTER H.A.S. HEADED ANCHOR STUD HB HOSE BIB HD HUB DRAIN HDNR HARDENER HDPE HIGH DENSITY POLYETHYLENE HDR HEADER HDW HARDWARE HGT HEIGHT HLA HIGH LEVEL ALARM HM HOLLOW METAL HNWR HAVASU NATIONAL WILDLIFE REFUGE HNWR HORIZONTAL HP HORSEPOWER HR HOSE RACK, HOUR HT HEAT TRACE HV HOSE VALVE HWL HIGH WATER LEVEL HWS HIGH WATER SURFACE HWY HIGHWAY</p>	<p>I & C INSTRUMENTATION AND CONTROL ID INSIDE DIAMETER IF INSIDE FACE IN INCH INFL INFLUENT INJ INJECTION INSTL INSTALL INSTM INSTRUMENTATION INSUL INSULATION INVT INVERT IPS IRON PIPE SIZE IRZ IN-SITU REACTIVE ZONE ITG INSULATED TEMPERED GLASS IWR IRRIGATION WATER</p>	<p>JAN JANITOR JT JOINT KIP THOUSAND POUNDS KW KILOWATT</p>	<p>L LENGTH OF CURVE LAB LABORATORY LAT LATERAL DRAIN LINE LAV LAVATORY LB POUNDS LB/CU FT POUNDS PER CUBIC FOOT LB/D POUNDS PER DAY LF LINEAR FEET LG LONG LLDPE LINEAR LOW DENSITY POLYETHYLENE LLV LONG LEG VERTICAL LNTL LINTEL LOC LIMIT OF CONSTRUCTION LONGJ LONGITUDINAL LP LOCAL PANEL LR LONG RADIUS LT LIGHT, LEFT LWL LOW WATER LEVEL</p>	<p>MATL MATERIAL MAX MAXIMUM MB MACHINE BOLT MOC MOTOR CONTROL CENTER MECH MECHANICAL MFR MANUFACTURER MGD MILLION GALLONS PER DAY MGL MILLIGRAMS PER LITER MH MAINTENANCE HOLE MHT MALE HOSE THREAD MIN MINIMUM MIFP MALE IRON PIPE THREAD MISC MISCELLANEOUS MJ MECHANICAL JOINT MLSS MIXED LIQUOR SUSPENDED SOLIDS MLVSS MNPT MALE NATIONAL PIPE THREAD MASONRY MASONRY OPENING MON MONUMENT MOUNTED MOUNTING MTL METAL MTRG METERING MTS MILL TYPE STEEL MW MONITORING WELL MWS MAXIMUM WATER SURFACE</p>	<p>N NORTH N/A NOT APPLICABLE NIC NOT IN CONTRACT NO. NUMBER NOM NOMINAL NORM NORMAL NTH NATIONAL TRAILS HIGHWAY</p>	<p>NPT NATIONAL PIPE THREAD NTS NOT TO SCALE O TO O OUT TO OUT OC ON CENTER OD OUTSIDE DIAMETER, OVERFLOW DRAIN OF OUTSIDE FACE, OVERFLOW O/H OVERHEAD OPNG OPENING OPP OPPOSITE OSD OPEN SITE DRAIN OVFL OVERFLOW OZ OUNCE P PLASTER PBD PARTICLE BOARD P & ID PROCESS AND INSTRUMENTATION DIAGRAM PC POINT OF CURVE PCC PORTLAND CEMENT CONCRETE PE PLAIN END, POLYETHYLENE PEN PENETRATE PERF PERFORATED PERP PERPENDICULAR PF PARTIAL FLUME PI POINT OF INTERSECTION PIP PLASTIC IRRIGATION PIPE PJF PREMOLDED JOINT FILLER PKG PACKAGE PL PLATE (STEEL) PLAM PLASTIC LAMINATE PLYWD PLYWOOD PMP PLANT MONITORING PANEL, PUMP PNL PANEL POC POINT ON CURVE POT POINT ON TANGENT PP POLYPROPYLENE PPL POLYPROPYLENE LINED PR PAIR PRECAST PRECAST PREFAB PREFABRICATED PRELIM PRELIMINARY PREP PREPARE PRESS PRESSURE PRI PRIMARY PROP PROPERTY PSP PUMP STATION PSF POUNDS PER SQUARE FOOT PSI POUNDS PER SQUARE INCH PSIA POUNDS PER SQUARE INCH, ABSOLUTE PSIG POUNDS PER SQUARE INCH, GAUGE PSV PRESSURE SUSTAINING VALVE PT POINT OF TANGENCY PVC POINT OF VERTICAL CURVATURE, POLYVINYL CHLORIDE PVI POINT OF VERTICAL INTERSECTION PVT PAVEMENT PWR POINT OF VERTICAL TANGENCY POWER</p>	<p>QUAD QUADRANT</p>	<p>R RISER R R-VALUE (INSULATION) RA RETURN AIR RAD RADIUS RAV RAVINE RC RELATIVE COMPACTION RCD REINFORCED CONCRETE PIPE ROOF DRAIN RDCR REDUCER RDW REDWOOD REF REFER OR REFERENCE REFR REFRIGERATOR REHAB REHABILITATION REINF REINFORCED, REINFORCING, REINFORCE RELOC RELOCATE REQD REQUIRED REV REVISE RESIL RESILIENT RGS RIGID GALVANIZED STEEL CONDUIT RH RODHOLE RL RAIN LEADER RLS RUBBER LINED STEEL RM ROOM RO ROUGH OPENING RST REINFORCING STEEL RT RIGHT RTN RETURN RV ROOF VENT RW REMEDY WATER R/W RIGHT-OF-WAY</p>	<p>S SOUTH, SLOPE SC SUSPENDED ACOUSTICAL TILE SC SOLID CORE SCFM STANDARD CUBIC FEET PER MINUTE SCHED SCHEDULE SD STORM DRAIN, SOAP DISPENSER SDR STANDARD DIMENSION RATIO SDWK SIDEWALK SEC SECONDARY SECT SECTION SEW SEWAGE</p>	<p>SF SHALLOW FLOOD SG SAFETY GLASS SH SHEET, SODIUM HYPOCHLORITE SHLD SHOULDER SHS SOLIDS HANDLING SYSTEM SHTG SHEETING SIM SIMILAR SIP STATE IMPLEMENTATION PLAN SLOPE SLOPE SLV SHORT LEG VERTICAL S.O. SHUTOFF SOC SOCKET SOLN SOLUTION SP SPACE OR SPACES SPEC SPECIFICATIONS SPECID SPECIFIED SPG SPACING SPIGT SPIGOT SPLY SUPPLY SQ SQUARE SQ FT SQUARE FOOT SQ IN SQUARE INCH SST STAINLESS STEEL, SANITARY SEWER SST STAINLESS STEEL STA STATION STD STANDARD STIF STIFFENER STL STEEL STOR STORAGE STR STRAIGHT STR STRUCTURAL STRUCT STRUCTURE SUSP SUSPEND SYMM SYMMETRICAL SW SETTLED WATER</p>	<p>T TANGENT LENGTH, TREAD, TELEPHONE, TURNOUT, THICKNESS TAN TANGENT T & B TOP AND BOTTOM TBG TUBING TC TOP OF CONCRETE, CURB TCS TOPOCK COMPRESSOR STATION TDH TOTAL DYNAMIC HEAD TECH TECHNICAL TEMP TEMPERATURE, TEMPORARY TF TOP FACE TG TEMPERED GLASS THD THREAD THK THICKNESS, THICK THRD THREADED THRU THROUGH T.O. TOP OF TURNOUT TOH TELEPHONE OVERHEAD TP TURNING POINT TPD TONS PER DAY TPI TURNOUT POINT OF INTERSECTION TRANSV TRANSVERSE TRI THRUST RESTRAINED LENGTH TSS TOTAL SUSPENDED SOLIDS TST TOP OF STEEL TT THRUST TIE, TEFLON TUBING TW TOP OF WALL, TAILWATER, CONDITIONED WATER, TRANSWESTERN TWPS TAILWATER PUMP STATION TYP TYPICAL</p>	<p>UNIFORM BUILDING CODE UH UNIT HEATER UL UNDERWRITERS LABORATORY ULT ULTIMATE UC UNDERCOAT UPGRAD UPGRADIENT UT UNDERGROUND TRENCH UV ULTRAVIOLET</p>	<p>V VENT, VOLT VAC VACUUM VAT VINYL ASBESTOS TILE VC VERTICAL CURVE VCP VITRIFIED CLAY PIPE VERT VERTICAL VPC VERTICAL POINT OF CURVATURE VPI VERTICAL POINT OF INTERSECTION VTR VENT THRU ROOF VWC VINYL WALL COVERING</p>	<p>W WIDE FLANGE (BEAM), WATTS, WEST W SH ST WEATHERING SHEET STEEL WD WOOD W/F WATTS PER FOOT WG WIRE GLASS WH WATER HEATER WK WEEK WR WASTE RECEPTACLE WR GWB WATER RESISTANT GYPSUM WALLBOARD WS WATER STOP OR WATER SURFACE WSTL WELDED STEEL WSP WELDED STEEL PIPE WT WEIGHT WTR WATER WWF WELDED WIRE FABRIC WWM WELDED WIRE MESH W/ WITH W/O WITHOUT "WG" INCHES WATER GAGE</p>	<p>XFMR TRANSFORMER YD YARD YR YEAR</p>
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NOTES:
1. STANDARD ABBREVIATIONS ARE SHOWN. THEREFORE, SOME ABBREVIATIONS MAY NOT BE USED ON THE DRAWINGS. FOR ABBREVIATIONS NOT LISTED, SEE "ABBREVIATIONS FOR USE ON DRAWINGS AND TEXT", PUBLISHED BY THE AMERICAN NATIONAL STANDARDS INSTITUTE, INC. (ANSI).
2. ADDITIONAL ABBREVIATIONS FOR SPECIALIZED WORK DIVISIONS (ELECTRICAL, ETC.) ARE SHOWN ON OTHER LEGEND SHEETS.

DATUM: HORIZONTAL: _____ VERTICAL: _____	PROJECTION: _____ UNITS: _____	NOV 2011 PRELIMINARY PLANS-NOT FOR CONSTRUCTION	APPR BY: _____ AUTHORIZATION: _____	TOPOCK GROUNDWATER REMEDIATION PROJECT ABBREVIATIONS PACIFIC GAS AND ELECTRIC COMPANY SAN FRANCISCO, CALIFORNIA	 SHEET NO. _____ OF _____ DRAWING NUMBER _____ G-3
SCALES: 1 inch = _____ 1 centimeter = _____		REVISIONS		DATE: _____ DESCRIPTION: _____ APPR. NO.: _____ DATE: _____ DESCRIPTION: _____ APPR. NO.: _____ DATE: _____ DESCRIPTION: _____	

LEGEND

- FRESH WATER LINE
- REMEDY PRODUCED WATER

FW-INJ-1

NTH IRZ INJECTION WELLS
11, 13, 15-17, 19- 21

CLEAN - IN - PLACE TANK

CARBON AMENDMENT FACILITIES AT MW-20

COLORADO RIVER

NTH IRZ INJECTION WELLS
25, 27, 29, 31, 33, 35,37,-39

HNWR-1 WELL

TO DOMESTIC CUSTOMERS

ARIZONA

CALIFORNIA

TOPOCK 2

TOPOCK 3

TO TCS

TO CARBON AMENDMENT FACILITIES AT TRANSWESTERN BENCH

TO REMEDY PRODUCED WATER CONDITIONING PLANT (SEE SHEET G-6)

EXISTING TCS FRESH WATER STORAGE TANKS (210,000 GAL EA.)

UPGRAD- INJ-1

UPGRAD- INJ-2

FW-INJ-2

UPGRAD- INJ-3

UPGRAD- INJ-4

COMP- INJ-1

COMP- INJ-2

FW-INJ-4

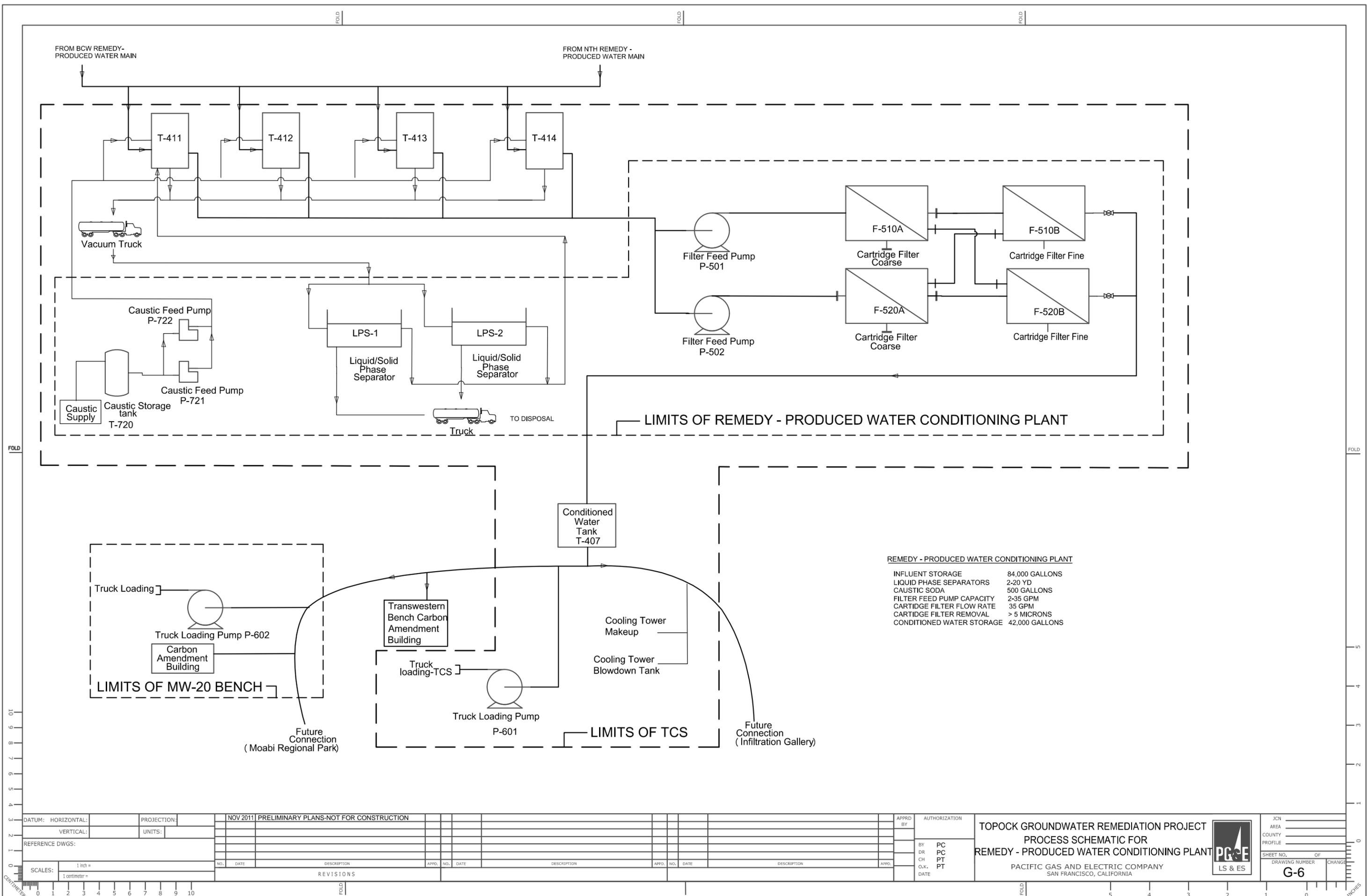
DATUM:	HORIZONTAL:	PROJECTION:	NOV 2011	PRELIMINARY PLANS-NOT FOR CONSTRUCTION
VERTICAL:	UNITS:			
REFERENCE DWGS:				
NO.	DATE	DESCRIPTION	APPR. NO.	DATE
REVISIONS				

APPRD BY:	AUTHORIZATION:
BY:	PC
DR:	PC
CH:	PT
O.K.:	PT
DATE:	

TOPOCK GROUNDWATER REMEDIATION PROJECT
PROCESS SCHEMATIC FOR FRESH WATER INJECTION
AND REMEDY - PRODUCED WATER
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA



JCN	AREA	COUNTY	PROFILE
SHEET NO.	OF	DRAWING NUMBER	CHANGE
		G-5	



REMEDY - PRODUCED WATER CONDITIONING PLANT

INFLUENT STORAGE	84,000 GALLONS
LIQUID PHASE SEPARATORS	2-20 YD
CAUSTIC SODA	500 GALLONS
FILTER FEED PUMP CAPACITY	2-35 GPM
CARTIDGE FILTER FLOW RATE	35 GPM
CARTIDGE FILTER REMOVAL	> 5 MICRONS
CONDITIONED WATER STORAGE	42,000 GALLONS

DATUM: HORIZONTAL:	PROJECTION:	NOV 2011	PRELIMINARY PLANS-NOT FOR CONSTRUCTION	APPR BY:	AUTHORIZATION:				
VERTICAL:	UNITS:			BY:	PC				
REFERENCE DWGS:				DR:	PC				
				CH:	PT				
				O.K.:	PT				
				DATE:					
SCALES:	1 inch =								
	1 centimeter =								
REVISONS		NO.	DATE	DESCRIPTION	APPR. NO.	DATE	DESCRIPTION	APPR. NO.	DATE

TOPOCK GROUNDWATER REMEDIATION PROJECT
PROCESS SCHEMATIC FOR
REMEDY - PRODUCED WATER CONDITIONING PLANT

PACIFIC GAS AND ELECTRIC COMPANY
 SAN FRANCISCO, CALIFORNIA

PG&E
 LS & ES

JCN
 AREA
 COUNTY
 PROFILE

SHEET NO. OF
 DRAWING NUMBER CHANGE
G-6

Remedy-Produced Water Stream	Total Influent to Tanks	Fresh Water Injection Wells, Backwash	Carbon-amended Wells, Backwash	Carbon-amended Wells (near TCS), Backwash	IRZ Wells, Backwash	Fresh Water Injection Wells, well rehabilitation - FIRST FLUSH	Carbon-amended Wells, well rehabilitation - FIRST FLUSH	Carbon-amended Wells (near TCS), well rehabilitation - FIRST FLUSH	IRZ Wells, well rehabilitation - FIRST FLUSH	Fresh Water Injection Wells, well rehabilitation - SECOND FLUSH	Carbon-amended Wells, well rehabilitation - SECOND FLUSH	Carbon-amended Wells (near TCS), well rehabilitation - SECOND FLUSH	IRZ Wells, well rehabilitation - SECOND FLUSH	Rainwater from containment areas	Sampling well purge water and equipment decontamination	T-401 to 404, Influent	Cartridge Filters F405A & B, Influent	Liquid/Solid Phase Separator, Influent	Phase Separator, Liquid Return	Conditioned Water Tank, Influent
Design Flow (MG/year)	7.3	1.9	1.9	0.23	0.72	0.18	0.04	0.02	0.36	0.42	0.10	0.05	0.84	0.3	0.1	7.3	6.6	0.7	~0.8	7.3
Design Flow (ac-ft/year)	22.43																			
TSS (mg/L)		10	60	60	60	60	60	60	60	10	60	60	60	10	10	60	67	928	85	<5
Solids (lbs/year)		159	951	115	361	90	22	11	180	35	50	25	421	25	8	3658	3658	5658	566	305
Solids (lbs/day)		-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	10	16	2	1
Nominal Flow (MG/year)	5.3	0.78	1.4	0.07	0.54	0.18	0.04	0.02	0.36	0.42	0.10	0.05	0.84	0.3	0.1	5.3	4.8	0.5	~0.8	5.3
Nominal Flow (ac-ft/year)	16.4																			
TSS (mg/L)		10	60	60	60	60	60	60	60	10	10	10	10	10	10	60	67	1048	70	<5
Solids (lbs/year)		65	701	35	270	90	22	11	180	35	8	4	70	25	8	2677	2677	4677	468	223
Solids (lbs/day)		-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	7	13	1	1
pH		7.4	7.4	7.4	7.4	2.01	2.01	2.01	2.01	~7	~7	~7	~7	~7	~7	2.01-7.4	7-7.4	7-7.4	7-7.4	6.5-8.5

DATUM: HORIZONTAL:		PROJECTION:		NOV 2011 PRELIMINARY PLANS-NOT FOR CONSTRUCTION		APPRD BY:		AUTHORIZATION:	
VERTICAL:		UNITS:							
REFERENCE DWGS:									
SCALES:		1 inch =		NO. DATE DESCRIPTION		APPRD. NO. DATE DESCRIPTION		BY: PC	
1 centimeter =				REVISIONS				CH: PC	
								O.K.: PT	
								DATE: PT	

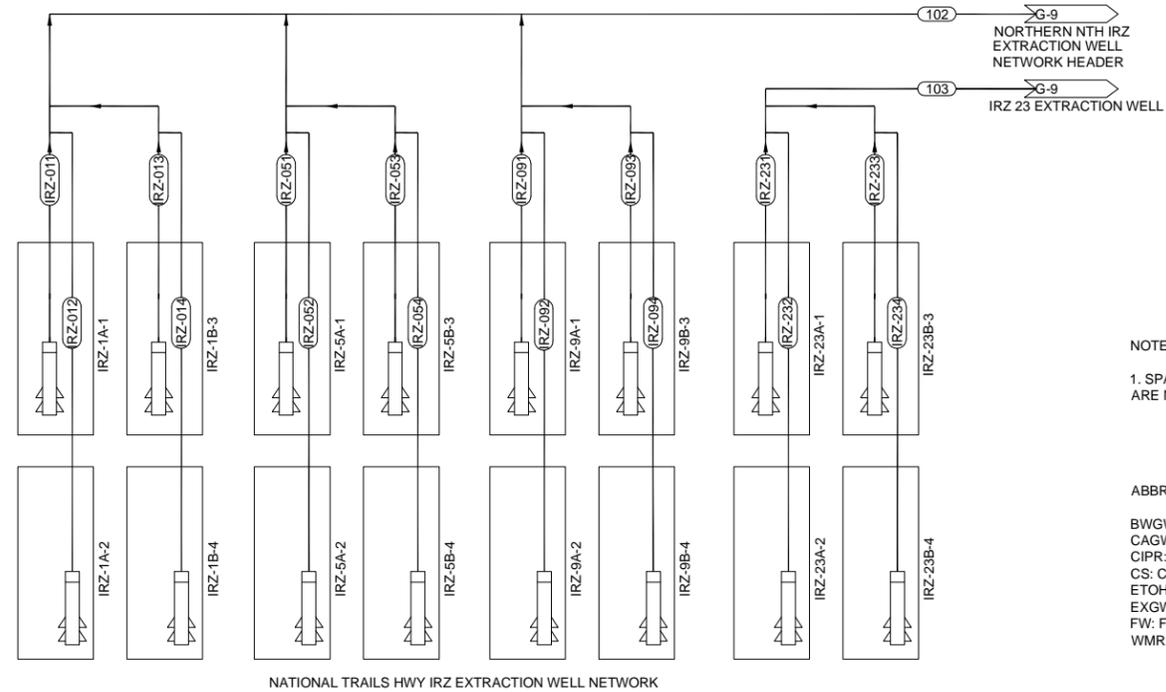
TOPOCK GROUNDWATER REMEDIATION PROJECT
MASS BALANCE SHEET
REMEDY - PRODUCED WATER CONDITIONING PLANT

PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA



JCN	AREA	COUNTY	PROFILE
SHEET NO.	DRAWING NUMBER	OF	CHANGE
G-6A			

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NOTES:
1. SPARE HEADERS ARE NOT SHOWN.

ABBREVIATIONS:
BWGW: BACKWASH GROUNDWATER
CAGW: CARBON AMENDED GROUNDWATER
CIPR: CLEAN IN PLACE REAGENT
CS: CARBON SUBSTRATE
ETOH: ETHANOL
EXGW: EXTRACTED GROUNDWATER
FW: FRESH WATER
WMR: WELL MAINTENANCE REAGENT

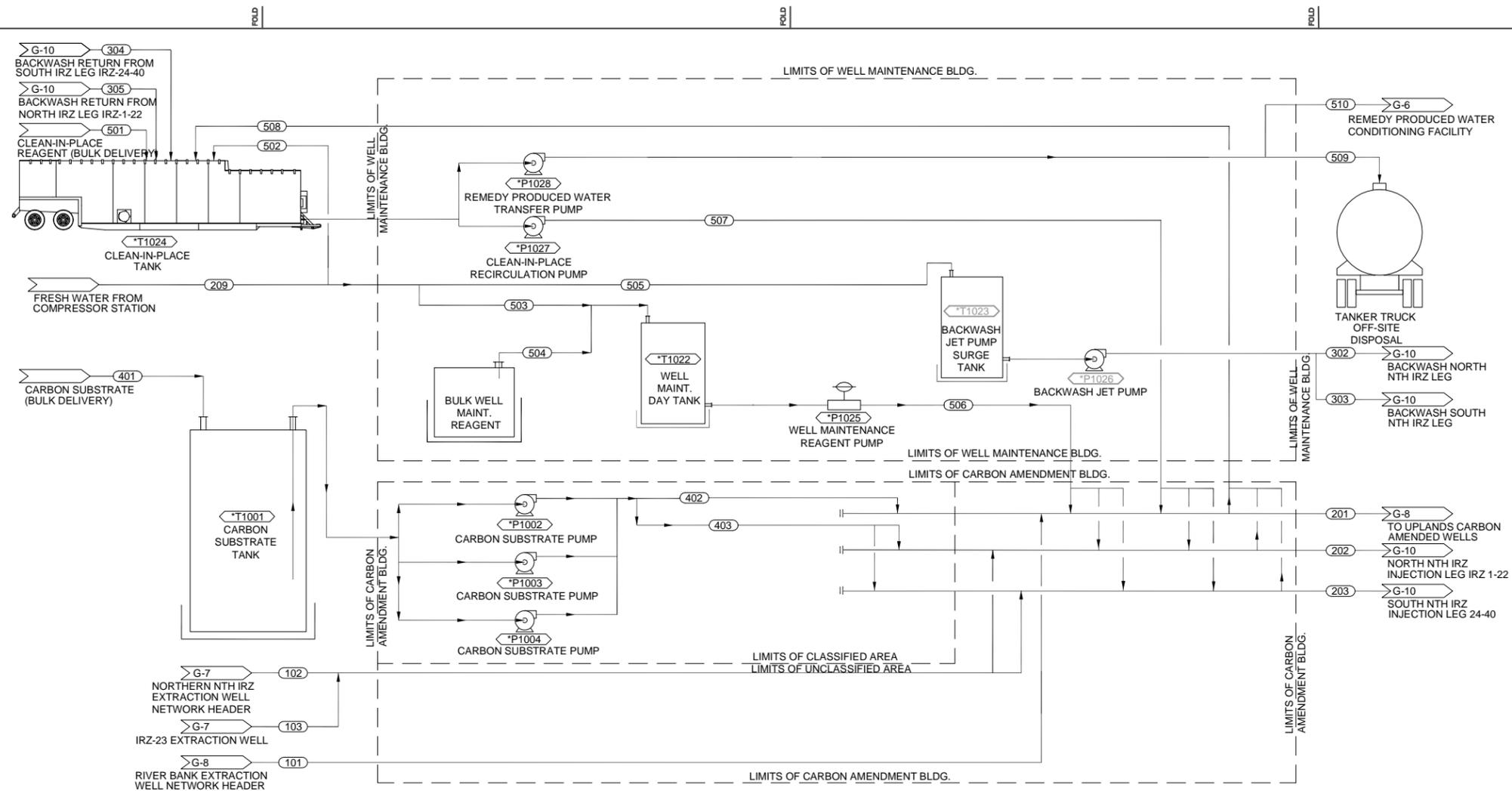
Design Basis and Mass Balance^a

Stream ID:	102	103	IRZ-011	IRZ-012	IRZ-013	IRZ-014	IRZ-051	IRZ-052	IRZ-053	IRZ-054	IRZ-091	IRZ-092	IRZ-093	IRZ-094	IRZ-231	IRZ-232	IRZ-233	IRZ-234
Stream Description:	EXGW	EXGW	EXGW	EXGW	EXGW	EXGW	EXGW	EXGW	EXGW	EXGW	EXGW	EXGW	EXGW	EXGW	EXGW	EXGW	EXGW	EXGW
Nominal Design Parameters																		
Flow Rate (GPM):	200	100	17	17	17	17	17	17	17	17	17	17	17	17	25	25	25	25
Carbon Substrate ^{b,c} (GPD):	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TOC ^{b,c} (mg/L):	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Chromium ^d (µg/L):	31	5,100	29	38	11	45	36	39	42	46	13	10	44	10	2,300	3,800	11,000	3,300
Chromium ^d (lbs/day):	7.4E-02	6.1	5.9E-03	7.7E-03	2.2E-03	9.2E-03	7.3E-03	7.9E-03	8.6E-03	9.4E-03	2.6E-03	2.0E-03	9.0E-03	2.0E-03	0.7	1.1	3.3	1.0
Maximum Design Parameters																		
Flow Rate (GPM):	400 ^e	---	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38
Carbon Substrate ^{b,c} (GPD):	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TOC ^{b,c} (mg/L):	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Chromium ^{d,f} (µg/L):	31	5,100	29	38	11	45	36	39	42	46	13	10	44	10	2,300	3,800	11,000	3,300
Chromium ^{d,f} (lbs/day):	8.1	---	1.3E-02	1.7E-02	5.0E-03	2.0E-02	1.6E-02	1.8E-02	1.9E-02	2.1E-02	5.9E-03	4.6E-03	2.0E-02	4.6E-03	1.0	1.7	5.0	1.5

a - Values represent target/estimated design parameters for initial operation; system operation may be modified to optimize system performance.
b - Denatured ethanol assumed; instantaneous dosage concentration will not exceed 1-percent by volume.
c - Average flow rate/concentration over time; carbon substrate dosing will be periodic and duration/frequency will vary.
d - Estimated initial concentration.
e - Total maximum NTH IRZ extracted groundwater flow limited to 400 gpm.
f - Maximum design parameters assume chromium concentrations and general flow distribution similar to nominal design parameters.

DATUM: HORIZONTAL	PROJECTION:	NOV 2011	PRELIMINARY PLANS - NOT FOR CONSTRUCTION										APPRD BY:	AUTHORIZATION:	TOPOCK GROUNDWATER REMEDIATION PROJECT PROCESS FLOW SCHEMATICS NTH IRZ EXTRACTION WELL NETWORK PACIFIC GAS AND ELECTRIC COMPANY SAN FRANCISCO, CALIFORNIA 									
VERTICAL:	UNITS:																							
REFERENCE DWGS:																								
SCALES: 1 inch =		NO. DATE DESCRIPTION APPD. NO. DATE DESCRIPTION APPD. NO. DATE DESCRIPTION APPD. NO. DATE DESCRIPTION APPD. NO. DATE DESCRIPTION		REVISIONS		BY: JB		DR: SS		CH: BW		C.K.: JF		DATE:		SHEET NO. OF		DRAWING NUMBER CHANGE						
1 centimeter =																G-7								

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NOTES:
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ABBREVIATIONS:
BWGW: BACKWASH GROUNDWATER
CAGW: CARBON AMENDED GROUNDWATER
CIPR: CLEAN IN PLACE REAGENT
CS: CARBON SUBSTRATE
ETOH: ETHANOL
EXGW: EXTRACTED GROUNDWATER
FW: FRESH WATER
WMR: WELL MAINTENANCE REAGENT

Design Basis and Mass Balance^{a,g}

Stream ID:	101	102	103	201	202	203	209	302	303	304 ^d	305 ^d	401	402	403	1102	501	502	503	504	505	506	507	508	509	510	
Stream Description:	EXGW	EXGW	EXGW	CAGW/FW	CAGW	CAGW	FW	SPARE	SPARE	BWG	BWG	ETOH	ETOH	ETOH	FW	CIPR	FW	FW	FW	FW	WMR	WMR	WMR	WMR/BWG	WMR/BWG	
Nominal Design Parameters																										
Flow Rate (GPM):	150	200	100	150	300	TBD	--	--	--	17	20	--	--	--	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	
Carbon Substrate ^{b,c} (GPD):	--	--	--	10	104	--	--	--	--	--	--	--	10	104	--	--	--	--	--	--	--	--	--	--	--	
TOC ^{b,c} (mg/L):	--	--	--	20	100	--	--	--	--	--	--	--	20	100	--	--	--	--	--	--	--	--	--	--	--	
Chromium ⁶ (µg/L):	10	31	5,100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
Chromium ⁶ (lbs/day):	1.8E-02	7.4E-02	6.1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
Maximum Design Parameters																										
Flow Rate (GPM):	500 ^e	400 ^f	600 ^h	400 ^f	--	--	--	--	--	35	40	--	--	--	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	
Carbon Substrate ^{b,c} (GPD):	--	--	--	104	694	--	--	--	--	--	--	--	104	694	--	--	--	--	--	--	--	--	--	--	--	
TOC ^{b,c} (mg/L):	--	--	--	50	500	--	--	--	--	--	--	--	50	500	--	--	--	--	--	--	--	--	--	--	--	
Chromium ⁶ (µg/L):	10	31	5,100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
Chromium ⁶ (lbs/day):	6.0E-02	8.1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	

- a - Values represent target/estimated design parameters for initial operation; system operation may be modified to optimize system performance.
- b - Denatured ethanol assumed; instantaneous dosage concentration will not exceed 1-percent by volume.
- c - Average flow rate/concentration over time; carbon substrate dosing will be periodic and duration/frequency will vary.
- d - Estimated initial concentration.
- e - Total maximum River Bank extracted groundwater flow limited to 500 gpm.
- f - Total maximum NTH IRZ extracted/injected groundwater flow limited to 400 gpm.
- g - Reference: G-7, G-8, G-10.
- h - Total maximum carbon-amended injection well flow limited to 600 gpm; may include freshwater (see G-8).
- i - Total backwash return water volume per week from NTH IRZ injection well network is approximately 18,000 gallons.

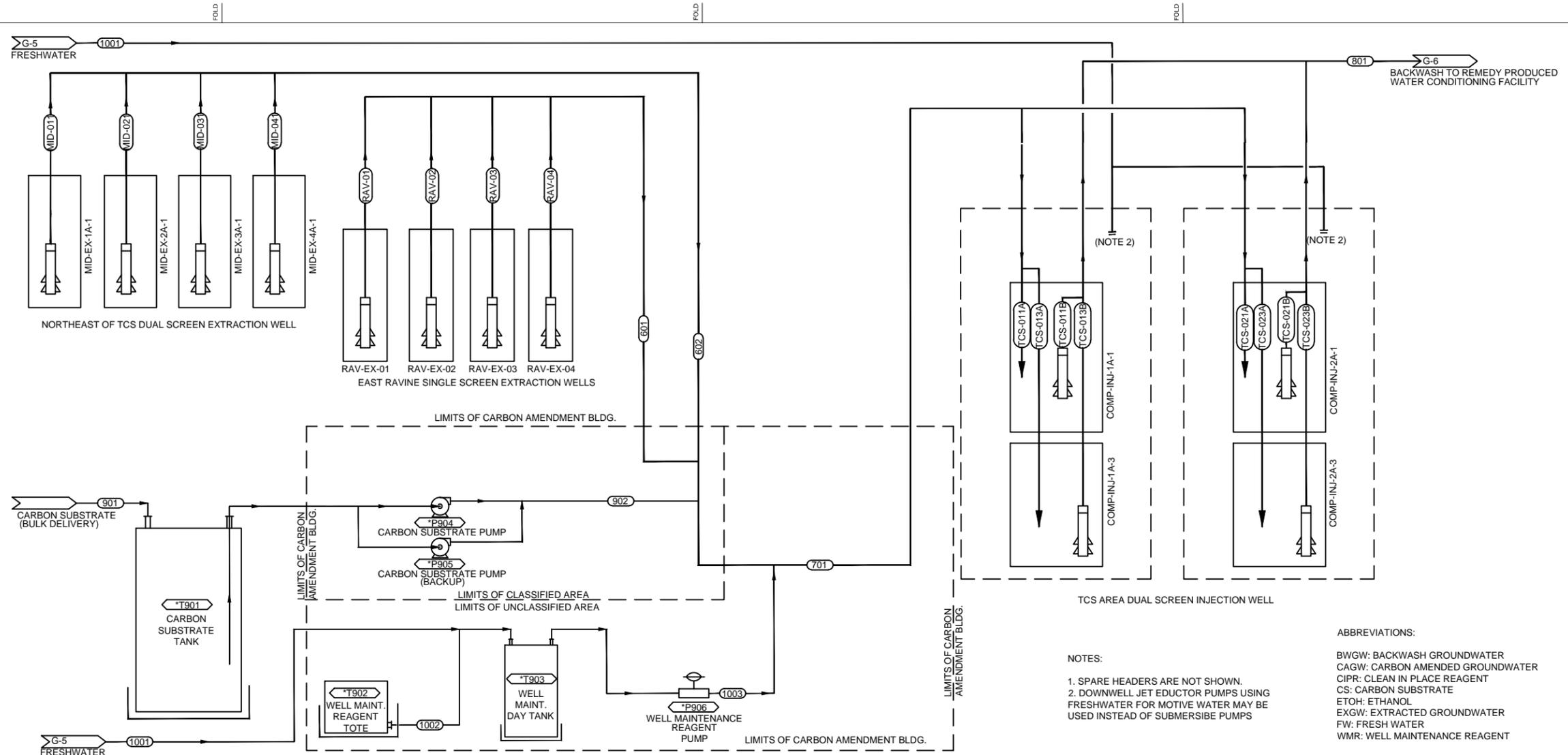
DATUM: HORIZONTAL:	PROJECTION:	NOV 2011 PRELIMINARY PLANS - NOT FOR CONSTRUCTION	APPRD BY:	AUTHORIZATION:
VERTICAL:	UNITS:		BY: JB	DR: SS
REFERENCE DWGS:			CH: BW	C.K. JF
SCALES: 1 inch = 10 feet			DATE:	
1 centimeter = 100 centimeters				
REVISIONS				
NO.	DATE	DESCRIPTION	APPRD. NO.	DATE

TOPOCK GROUNDWATER REMEDIATION PROJECT
PROCESS FLOW SCHEMATIC
CARBON SUBSTRATE AMENDMENT AND
CLEAN-IN-PLACE SYSTEMS
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA



JCN	AREA	COUNTY	PROFILE
SHEET NO.	OF	DRAWING NUMBER	CHANGE
		G-9	

G:\project\PE\IRC000689\TOPOCK\CADD\Final Remedy\30% - Final\IRZ PFD.dwg , G-11, 11/18/2011 12:35:28 PM



NOTES:
 1. SPARE HEADERS ARE NOT SHOWN.
 2. DOWNWELL JET EDUCTOR PUMPS USING FRESHWATER FOR MOTIVE WATER MAY BE USED INSTEAD OF SUBMERSIBLE PUMPS

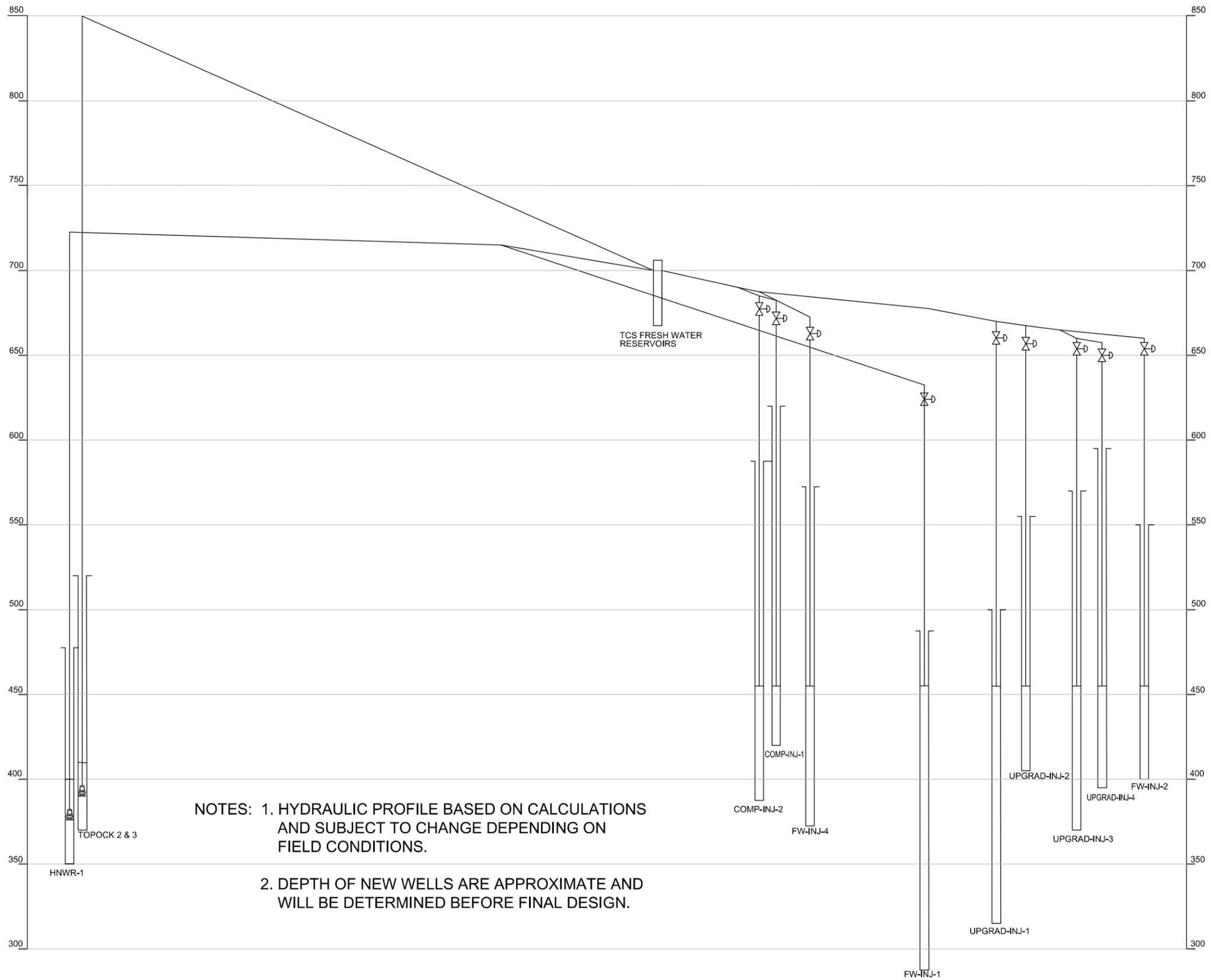
ABBREVIATIONS:
 BWGW: BACKWASH GROUNDWATER
 CAGW: CARBON AMENDED GROUNDWATER
 CIPR: CLEAN IN PLACE REAGENT
 CS: CARBON SUBSTRATE
 ETOH: ETHANOL
 EXGW: EXTRACTED GROUNDWATER
 FW: FRESH WATER
 WMR: WELL MAINTENANCE REAGENT

Design Basis and Mass Balance^a

Stream ID:	601	602	701	801	901	902	1001	1002	1003	MID-011	MID-021	MID-031	MID-041	RAV-01	RAV-02	RAV-03	RAV-04	TCS-011A	TCS-011B	TCS-013A	TCS-013B	TCS-021A	TCS-021B	TCS-023A	TCS-023B		
Stream Description:	EXGW	EXGW	CAGW	BWGW	ETOH	ETOH	FW	FW	WMR	EXGW	CAGW	BWGW	CAGW	BWGW	CAGW	BWGW	CAGW	BWGW									
Nominal Design Parameters																											
Flow Rate (GPM):	2	19	21	11	---	---	TBD	TBD	TBD	8	6	3	2	0.5	0.5	0.5	0.5	5.3	11	5.3	11	5.3	11	5.3	11		
Carbon Substrate ^{b,c} (GPD):	---	---	7.4	---	---	7.4	---	---	---	---	---	---	---	---	---	---	---	1.8	---	1.8	---	1.8	---	1.8	---		
TOC ^{b,c} (mg/L):	---	---	100	---	---	100	---	---	---	---	---	---	---	---	---	---	---	100	---	100	---	100	---	100	---		
Chromium ^d (µg/L):	193	3,526	---	---	---	---	---	---	---	4,200	3,500	3,600	800	400	250	65	55	---	---	---	---	---	---	---	---		
Chromium ^d (lbs/day):	4.6E-03	8.0E-01	---	---	---	---	---	---	---	4.0E-01	2.5E-01	1.3E-01	1.9E-02	2.4E-03	1.5E-03	3.9E-04	3.3E-04	---	---	---	---	---	---	---	---		
Maximum Design Parameters																											
Flow Rate (GPM):	4	60	75	40	---	38	TBD	TBD	TBD	15	15	15	15	1	1	1	1	19	38	19	38	19	38	19	38		
Carbon Substrate ^{b,c} (GPD):	---	---	130	---	---	130	---	---	---	---	---	---	---	---	---	---	---	33	---	33	---	33	---	33	---		
TOC ^{b,c} (mg/L):	---	---	500	---	---	500	---	---	---	---	---	---	---	---	---	---	---	500	---	500	---	500	---	500	---		
Chromium ^d (µg/L):	193	3,025	---	---	---	---	---	---	---	4,200	3,500	3,600	800	400	250	65	55	---	---	---	---	---	---	---	---		
Chromium ^d (lbs/day):	9.2E-03	2.2	---	---	---	---	---	---	---	7.5E-01	6.3E-01	6.5E-01	1.4E-01	4.8E-03	3.0E-03	7.8E-04	6.6E-04	---	---	---	---	---	---	---	---		

a - Values represent target/estimated design parameters for initial operation; system operation may be modified to optimize system performance.
 b - Denatured ethanol assumed; instantaneous dosage concentration will not exceed 1-percent by volume.
 c - Average flow rate/concentration over time; carbon substrate dosing will be periodic and duration/frequency will vary.
 d - Estimated initial concentration.

DATUM: HORIZONTAL: _____ VERTICAL: _____ REFERENCE DWGS: _____	PROJECTION: _____ UNITS: _____	NOV 2011 PRELIMINARY PLANS - NOT FOR CONSTRUCTION			APPR BY: _____ AUTHORIZATION: _____
TOPOCK GROUNDWATER REMEDIATION PROJECT PROCESS FLOW SCHEMATIC TCS RECIRCULATION LOOP PACIFIC GAS AND ELECTRIC COMPANY SAN FRANCISCO, CALIFORNIA					
SCALES: 1 inch = _____ 1 centimeter = _____			SHEET NO. _____ OF _____ DRAWING NUMBER _____ CHANGE _____ G-11		



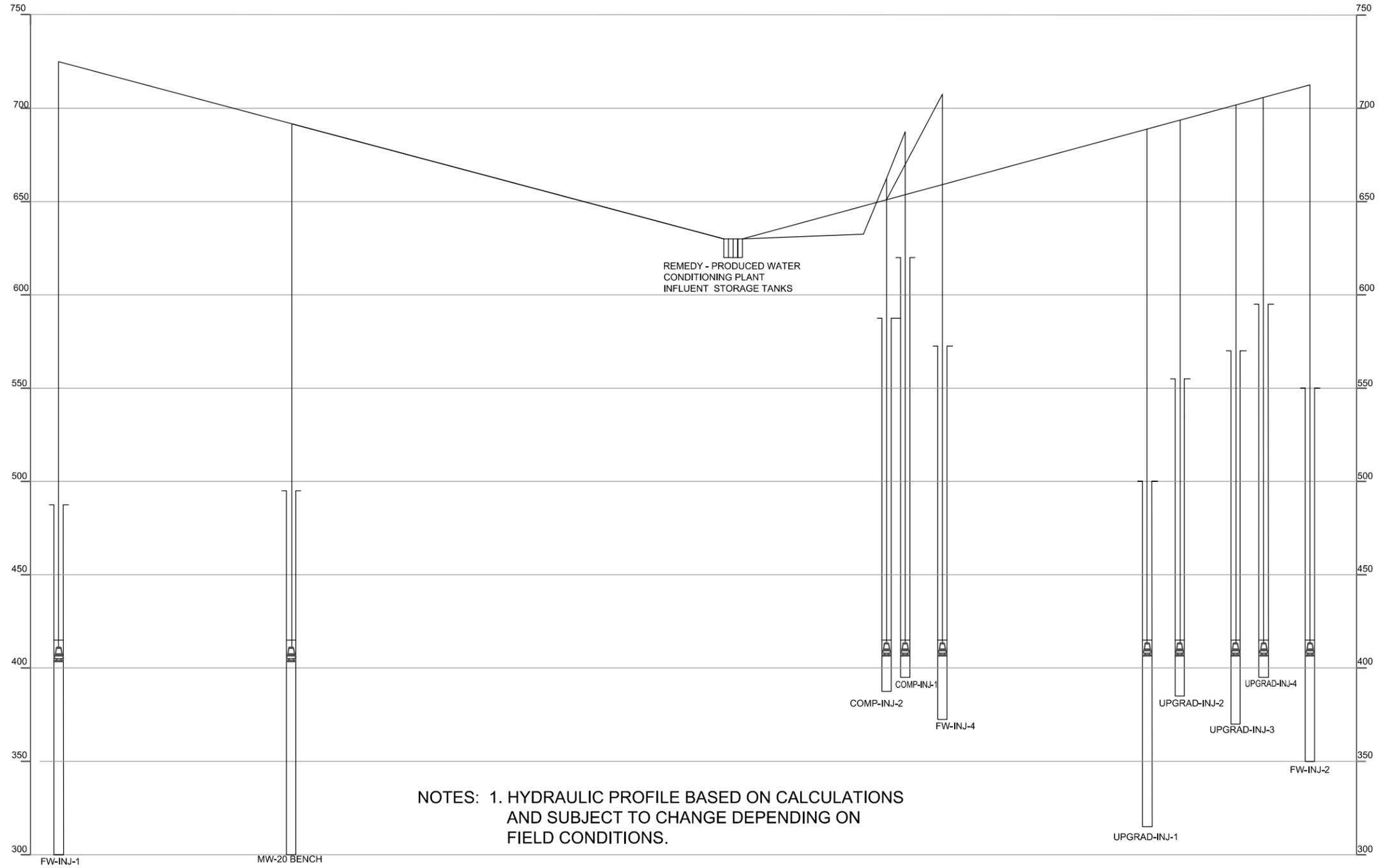
NOTES: 1. HYDRAULIC PROFILE BASED ON CALCULATIONS AND SUBJECT TO CHANGE DEPENDING ON FIELD CONDITIONS.
 2. DEPTH OF NEW WELLS ARE APPROXIMATE AND WILL BE DETERMINED BEFORE FINAL DESIGN.

DATUM: HORIZONTAL:		PROJECTION:		NOV 2011 PRELIMINARY PLANS-NOT FOR CONSTRUCTION		APPRD BY:		AUTHORIZATION	
VERTICAL:		UNITS:							
REFERENCE DWGS:									
SCALES: 1 inch =		1 centimeter =		NO. DATE DESCRIPTION		APPRD. NO. DATE DESCRIPTION		APPRD. NO. DATE DESCRIPTION	
				REVISTONS					

TOPOCK GROUNDWATER REMEDIATION PROJECT
HYDRAULIC PROFILE
FRESHWATER INJECTION SYSTEM

PACIFIC GAS AND ELECTRIC COMPANY
 SAN FRANCISCO, CALIFORNIA

JCN	AREA	COUNTY	PROFILE
SHEET NO.	OF	DRAWING NUMBER	CHANGE
G-12			



NOTES: 1. HYDRAULIC PROFILE BASED ON CALCULATIONS AND SUBJECT TO CHANGE DEPENDING ON FIELD CONDITIONS.

2. DEPTH OF NEW WELLS ARE APPROXIMATE AND WILL BE DETERMINED BEFORE FINAL DESIGN.

DATUM: HORIZONTAL: _____ VERTICAL: _____ REFERENCE DWGS: _____ SCALES: 1 inch = _____ 1 centimeter = _____	PROJECTION: _____ UNITS: _____	NOV 2011 PRELIMINARY PLANS-NOT FOR CONSTRUCTION NO. DATE DESCRIPTION APPD. NO. DATE DESCRIPTION APPD. NO. DATE DESCRIPTION APPD. NO. DATE DESCRIPTION	REVISIONS	APPRD BY: _____ AUTHORIZATION: _____ BY DR PC CH PC O.K. PT DATE PT	TOPOCK GROUNDWATER REMEDIATION PROJECT HYDRAULIC PROFILE REMEDY - PRODUCED WATER CONDITIONING PLANT PACIFIC GAS AND ELECTRIC COMPANY SAN FRANCISCO, CALIFORNIA		JCN _____ AREA _____ COUNTY _____ PROFILE _____ SHEET NO. _____ OF _____ DRAWING NUMBER _____ CHANGE _____ G-13
--	-----------------------------------	--	-----------	--	---	---	--

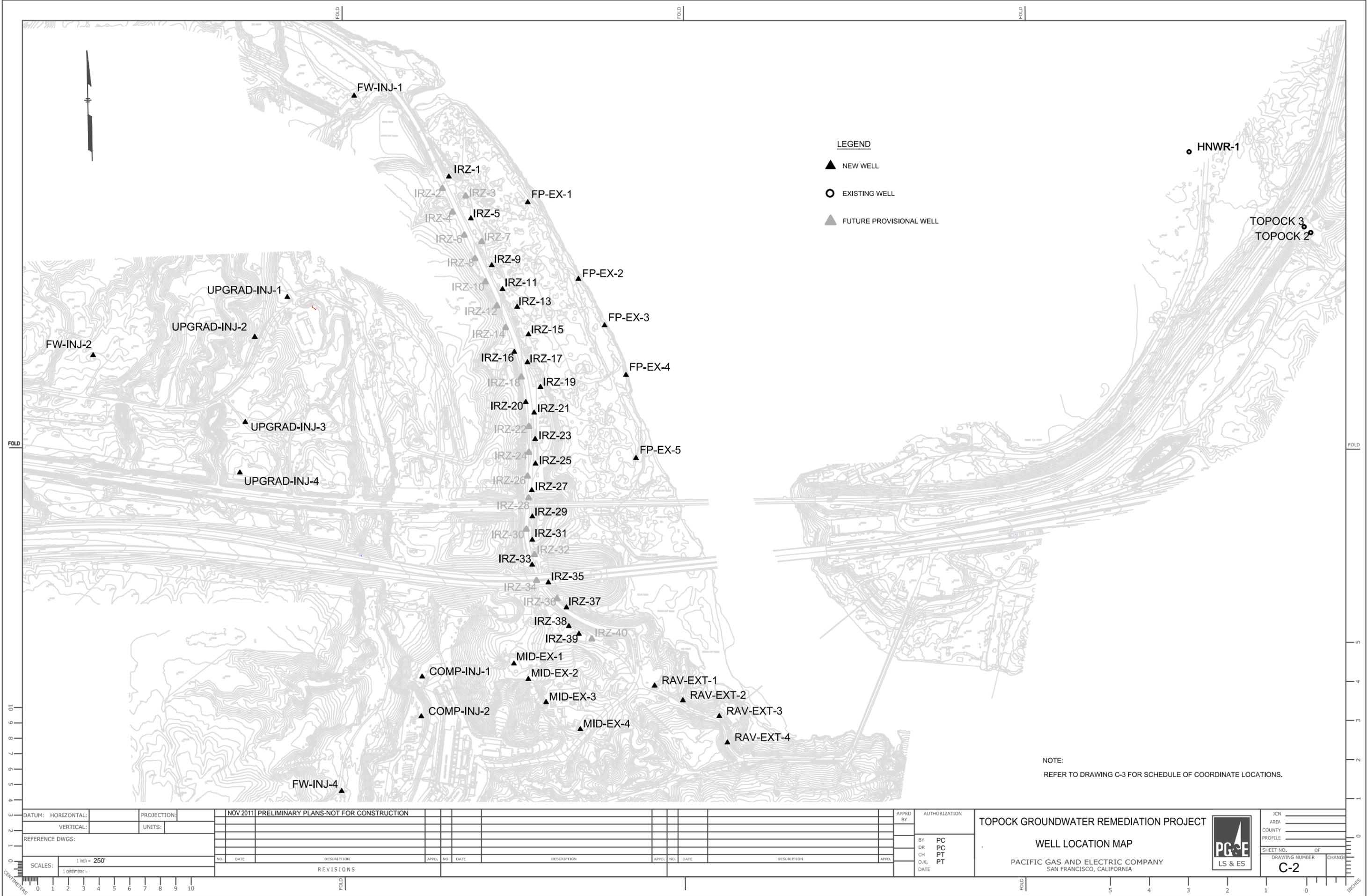
GENERAL NOTES

1. LOCATION OF UTILITIES HAVE BEEN DETERMINED FROM BEST AVAILABLE INFORMATION. HOWEVER, ACCURACY OR COMPLETENESS OF THE UTILITIES SHOWN IS NOT GUARANTEED. FIELD VERIFY THE LOCATION OF UTILITIES PRIOR TO CONSTRUCTION (SEE SPECIFICATIONS). UTILITIES SHOWN ON THE DRAWINGS ARE UNDERGROUND UNLESS OTHERWISE NOTED. THE CONTRACTOR SHALL CONTACT THE FOLLOWING RESPECTIVE PARTIES FOR LOCATION OF UNDERGROUND UTILITIES AT LEAST 48 HOURS IN ADVANCE OF INTRUSIVE FIELD WORK :
 - A. UNDERGROUND SERVICE ALERT (USA) AIL (800) 643-2444
 - B. PACIFIC GAS AND ELECTRIC (PG&E) (800) 743-5000
2. ANY DAMAGE TO EXISTING PIPELINES AND OTHER IMPROVEMENTS NOT SCHEDULED FOR REPLACEMENT AS PART OF THIS WORK, DUE TO CONSTRUCTION ACTIVITIES, SHALL BE REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
3. NO EXCAVATED MATERIAL SHALL BE STORED ON SITE, EXCEPT AS APPROVED BY OWNER.
4. DISPOSE OF UNUSABLE EXCAVATED MATERIAL AT NO ADDITIONAL COST TO THE OWNER.
5. THE CONTRACTOR IS ADVISED TO POT-HOLE IN ADVANCE OF WORK PROGRESS TO VERIFY EXISTENCE AND LOCATION OF UTILITIES AND UTILITY CROSSINGS. PERFORM POT-HOLING UNDER THE PRESENCE AND SUPERVISION OF THE OWNER'S REPRESENTATIVE AND RESPECTIVE UTILITY REPRESENTATIVES. HAND DIGGING IS REQUIRED IN AREAS WHERE BURIED HAZARDOUS FACILITIES ARE LOCATED. SEE SECTION 01040 FOR IDENTIFICATION OF CRITICAL LOCATIONS FOR WHICH MANDATORY POTHOLING IS REQUIRED.
6. WHERE TEMPORARY OR PERMANENT RELOCATION OF EXISTING UNDERGROUND OR OVERHEAD UTILITIES IS REQUIRED, TAKE NECESSARY STEPS TO ENSURE THAT CONTINUOUS SERVICE IS MAINTAINED IN A MANNER APPROVED BY THE AFFECTED UTILITY AND IN ACCORDANCE WITH APPLICABLE COUNTY AND STATE PUBLIC HEALTH REGULATIONS. BEAR ALL COSTS ASSOCIATED WITH RELOCATION AND MAINTENANCE OF SERVICE, EXCEPT AS OTHERWISE NOTED ON THE DRAWINGS OR SPECIFICATIONS.
7. THE OWNER HAS ACQUIRED TEMPORARY CONSTRUCTION EASEMENTS AND STORAGE AREAS AS SHOWN ON THE DRAWINGS. SEE SPECIAL PROJECT PROCEDURES, SECTION 01100 OF THE SPECIFICATIONS, FOR ANY REQUIREMENTS PERTAINING TO THESE EASEMENT RIGHTS. IF ADDITIONAL TEMPORARY EASEMENTS FOR STORAGE OR CONSTRUCTION OPERATIONS ARE REQUIRED OR DESIRED, ASSUME FULL RESPONSIBILITY TO OBTAIN SUCH AT NO EXPENSE TO THE OWNER. FILE A COPY OF EACH WRITTEN AGREEMENT BETWEEN THE CONTRACTOR AND THE PROPERTY OWNER FOR EASEMENTS THUS ACQUIRED WITH THE PROJECT OWNER PRIOR TO ENTRY INTO OR USE OF THE RESPECTIVE AREAS.
8. PLACE EROSION AND SILTATION CONTROL MEASURES PRIOR TO OR AS FIRST STEP IN GRADING.
9. DURING CONSTRUCTION, PROTECT EXISTING STORM SEWER AND DRAIN INLETS AND NEWLY CONSTRUCTED MANHOLES AND UNDERGROUND VAULTS BY SILT TRAPS. MAINTAIN AND MODIFY PROTECTIVE MEASURES AS CONSTRUCTION PROGRESSES.
10. RESTORE EXISTING NATURAL DRAINAGE DITCHES AND STREAM BANKS DISTURBED DURING CONSTRUCTION TO ORIGINAL ALIGNMENT, GRADE AND INVERT, EXCEPT WHERE OTHERWISE INDICATED. EMPLOY EROSION CONTROL MEASURES AS SPECIFIED.
11. PROVIDE 3 FEET MINIMUM COVER OVER TOP OF PIPE UNLESS OTHERWISE SPECIFICALLY SHOWN ON THE PIPELINE DRAWINGS.
12. RESTRAINED (WELDED OR MECHANICALLY JOINED) PIPE JOINTS ARE USED FOR RESISTANCE TO THRUST AT PIPE BENDS AND FOR PROTECTION OF PARALLEL WATER MAINS. MINIMUM LIMITS OF RESTRAINED JOINTS ARE SHOWN ON THE DRAWINGS. SHOULD A CHANGE IN ALIGNMENT OCCUR THAT RESULTS IN CHANGED OR ADDED PIPE BENDS OR RW/TW PIPELINE TO BE CLOSER THAN 5 FEET TO A PARALLEL WATER MAIN, PROVIDE ADDITIONAL WELDED PIPE JOINTS AS REQUIRED AND DIRECTED BY OWNER.
13. WHERE PIPELINE CROSSES WATER MAINS, AVOID IF POSSIBLE INSTALLING PIPE JOINT WITHIN 10 FOOT DISTANCE OF EACH SIDE OF CROSSING WATER MAIN. IF A JOINT IN THIS ZONE IS UNAVOIDABLE, INSTALL WELDED JOINT ONLY. REPLACE ALL SEVERED OR DAMAGED MAINS CROSSING CONSTRUCTION TRENCHES UNDER INSPECTION OF THE ENTITY HAVING JURISDICTION. PERFORM EXCAVATION, PIPE INSTALLATION, BACKFILL COMPACTION AND RESTORATION WORK NECESSARY FOR REPLACEMENT AT NO ADDITIONAL EXPENSE TO THE OWNER. REFERENCE SPECIFICATION SECTION 01050 AND 01100.
14. VERTICAL CONTROL: PIPE CENTERLINE IS INDICATED ON THE DRAWINGS. IT IS THE INTENT OF THESE DRAWINGS THAT PIPE CENTERLINE ELEVATIONS SHOWN AT VERTICAL ANGLE POINTS EXCEPT WHERE A FITTING IS SPECIFICALLY INDICATED, ARE FOR THE PURPOSE OF ESTABLISHING A P.I. FOR VERTICAL CURVES USING JOINT DEFLECTION. WHERE THE VERTICAL P.I. SHOWN WOULD CREATE A CONFLICT WITH THE STATED MINIMUM COVER, THE MINIMUM COVER HAS PRECEDENCE. PIPE SLOPES SHOWN ARE FOR INFORMATION ONLY, INVERT ELEVATIONS NOTED CONTROL.
15. UNLESS OTHERWISE NOTED, ELEVATIONS SHOWN ON THESE DRAWINGS ARE BASED ON THE U.S. COAST AND GEODETIC SURVEY MEAN SEA LEVEL OF 1929.
16. HORIZONTAL CONTROL. THE BEARINGS AND DISTANCES SHOWN ARE BASED UPON THE CALIFORNIA COORDINATE SYSTEM ZONE 5.
17. HORIZONTAL CONTROL POINTS ARE INDICATED ON THE DRAWINGS FOR THE PURPOSE OF DEFINING A SPECIFIC, REQUIRED ALIGNMENT. WHERE PERMITTED ON A CASE-BY-CASE BASIS, THE HORIZONTAL CONTROL POINTS MAY BE USED AS A P.I. FOR HORIZONTAL CURVES PROVIDED THE RESULTING PIPELINE ALIGNMENT DOES NOT COME CLOSER THAN 5 FEET FROM ANY PARALLEL WATER MAIN. CONSTRUCT HORIZONTAL CURVES BY DEFLECTING PIPE JOINTS PRIOR TO WELDING. DO NOT EXCEED MAXIMUM ALLOWABLE JOINT DEFLECTION SHOWN IN SPECIFICATIONS.
18. REPLACE ALL ROAD SURFACE, BERMS AND FENCING DAMAGED DURING CONSTRUCTION, AS PER SPECIFICATIONS AND DRAWINGS.
19. LOCATE COMBINATION AIR RELEASE AND VACUUM VALVE ASSEMBLIES AND AIR RELEASE ASSEMBLIES AT HIGH POINTS IN PIPING AS SHOWN ON THE DRAWINGS. INSTALL PIPE TO SLOPE CONTINUOUSLY AWAY (DOWN) FROM THE STATION MARK FOR THE VALVE INSTALLATION FROM BOTH SIDES. LOCATE BLOW-OFF ASSEMBLIES, WHERE SHOWN ON THE DRAWINGS, AT LOW POINTS IN THE PIPING. INSTALL PIPE TO SLOPE CONTINUOUSLY TOWARD THE VALVE INSTALLATION FROM BOTH SIDES. OBTAIN OWNER VERIFICATION IN FIELD LOCATING OF ALL VALVE ASSEMBLIES BEFORE INSTALLING.
20. STORAGE OF PIPE OR OTHER MATERIALS ON PUBLIC RIGHTS-OF-WAY OR PRIVATE PROPERTY DURING NON-WORKING HOURS WILL NOT BE PERMITTED EXCEPT WHERE AND WHEN SPECIFICALLY APPROVED BY THE OWNER.
21. EXISTING CONCRETE THRUST BLOCKS AND ANCHORS AT VALVES AND FITTINGS ON EXISTING UTILITIES ARE NOT SHOWN. REMOVE OR WORK AROUND, AS DETERMINED BY THE OWNER OR RESPECTIVE UTILITY, THRUST BLOCKS AND ANCHORS WHICH INTERFERE WITH THE WORK. INCLUDE ALL COSTS FOR SUCH WORK IN PROPOSAL.
22. REFER TO SPECIFICATION SECTION 02772 AND DRAWINGS FOR SPECIFIC PAVING REQUIREMENTS. IN CONJUNCTION WITH THE FINAL PAVING OPERATIONS:
 - RESTORE SURVEY MONUMENTS DAMAGED AS A CONSEQUENCE OF CONSTRUCTION OPERATIONS.
 - RAISE TO FINISHED GRADE ALL METAL WORK (MANHOLE FRAME AND COVERS, VALVE BOXES, ETC.) EXISTING AND NEW, LOCATED IN AREAS PAVED AS PART OF THIS CONTRACT.
 - COMPLY WITH ALL THE GENERAL REQUIREMENTS AND REQUIREMENTS OF SECTION 01015, GENERAL PROVISIONS, REGARDING PROTECTION OF EXISTING IMPROVEMENTS.
23. MAINTAIN REQUIRED TRAFFIC CONTROL, INCLUDING SIGNAGE AND FLAGMEN, AT POINTS OF EGRESS FROM CONSTRUCTION SITE TO PUBLIC ROADS. COMPLY WITH SPECIFIED HAUL ROUTES. SEE SPECIFICATION SECTION 01550.

FOLD

FOLD

DATUM: HORIZONTAL: _____ VERTICAL: _____	PROJECTION: _____ UNITS: _____	NOV 2011 PRELIMINARY PLANS-NOT FOR CONSTRUCTION	APPRD BY: _____ AUTHORIZATION: _____	TOPOCK GROUNDWATER REMEDIATION PROJECT GENERAL NOTES PACIFIC GAS AND ELECTRIC COMPANY SAN FRANCISCO, CALIFORNIA	SHEET NO. _____ OF _____ DRAWING NUMBER _____ CHANGE _____ C-1
SCALES: 1 inch = _____ 1 centimeter = _____		REVISIONS			



LEGEND

- ▲ NEW WELL
- EXISTING WELL
- ▲ FUTURE PROVISIONAL WELL

NOTE:
REFER TO DRAWING C-3 FOR SCHEDULE OF COORDINATE LOCATIONS.

DATUM: HORIZONTAL:		PROJECTION:		NOV 2011 PRELIMINARY PLANS-NOT FOR CONSTRUCTION		APPRD BY:		AUTHORIZATION:	
VERTICAL:		UNITS:							
REFERENCE DWGS:									
SCALES: 1 inch = 250'		1 centimeter =		NO. DATE		DESCRIPTION		APPRD. NO. DATE	
				REVISIONS					

TOPOCK GROUNDWATER REMEDIATION PROJECT

WELL LOCATION MAP

PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA



JCN	AREA	COUNTY	PROFILE
SHEET NO.	OF	DRAWING NUMBER	CHANGE
		C-2	

Inner Recirculation Loop							
Well Location ID	Figure Coordinates 2011-1116 Pipes-Wells.dwg		Preliminary Injection/Extraction Rates (gpm)			Preliminary New Well Count	Preliminary Future Provisional Well Count
	X	Y	Nominal	Minimum	Maximum		
River Bank Extraction Wells							
FP-EX-1	7615763	2103917	25	25	170	1	0
FP-EX-2	7616062	2103473	0	25	170	1	0
FP-EX-3	7616213	2103198	50	25	170	1	0
FP-EX-4	7616337	2102908	50	25	170	1	0
FP-EX-5	7616397	2102423	25	25	170	1	0
Carbon-Amended Injection Wells							
UPGRAD-INJ-1	7614358	2103365	75	35	200	1	0
UPGRAD-INJ-2	7614167	2103132	75	35	200	1	0
UPGRAD-INJ-3	7614125	2102637	100	35	200	1	0
UPGRAD-INJ-4	7614080	2102340	200	35	200	1	0
Total New Well Count						9	0

Freshwater Supply/Injection Wells							
Well Location ID	Figure Coordinates 2011-1116 Pipes-Wells.dwg		Preliminary Injection/Extraction Rates (gpm)			Preliminary New Well Count	Preliminary Future Provisional Well Count
	X	Y	Nominal	Minimum	Maximum		
Freshwater Injection Wells							
FW-INJ-1	7614758	2104544	100	50	200	1	0
FW-INJ-2	7613231	2103029	100	50	200	1	0
FW-INJ-3			<i>TBD</i>	<i>TBD</i>	<i>TBD</i>	0	1
FW-INJ-4	7614676	2100486	50	25	100	1	0
Freshwater Supply Wells¹							
HNWR-1 (existing well)	7619647	2104214		900		0	0
Topock 2 (existing well)				400		0	0
Topock 3 (existing well)				200		0	0
Total New Well Count						3	1

TCS Recirculation Loop							
Well Location ID	Figure Coordinates 2011-1116 Pipes-Wells.dwg		Preliminary Injection/Extraction Rates (gpm)			Preliminary New Well Count	Preliminary Future Provisional Well Count
	X	Y	Nominal	Minimum	Maximum		
Extraction Wells Northeast of TCS							
MID-EX-1	7615683	2101223	8	1	15	1	0
MID-EX-2	7615776	2101142	6	1	15	1	0
MID-EX-3	7615892	2101009	3	1	15	1	0
MID-EX-4	7616085	2100843	2	1	15	1	0
East Ravine Extraction Wells							
RAV-EXT-1	7616506	2101095	0.5			1	0
RAV-EXT-2	7616672	2101010	0.5			1	0
RAV-EXT-3	7616886	2100918	0.5	2 total	4 total	1	0
RAV-EXT-4	7616933	2100764	0.5			1	0
TCS Injection Wells							
comp-inJ-1	7615160	2101151	5.3	2.5	19	1	0
comp-inJ-2	7615155	2100919	5.3	2.5	19	1	0
Total New Well Count						10	0

National Trails Highway In-Situ Reactive Zone							
Well Location ID	Figure Coordinates 2011-1116 Pipes-Wells.dwg		Preliminary Injection/Extraction Rates (gpm)			Preliminary New Well Count	Preliminary Future Provisional Well Count
	X	Y	Nominal	Minimum	Maximum		
NTH IRZ Wells							
IRZ-1 (Extraction)	7615314	2104070	67	50	150	2	0
IRZ-2	7615276	2104001	0	0	25	0	2
IRZ-3	7615399	2103953	0	0	25	0	2
IRZ-4	7615335	2103863	0	0	25	0	2
IRZ-5 (Extraction)	7615443	2103826	67	50	150	2	0
IRZ-6	7615404	2103729	0	0	25	0	2
IRZ-7	7615506	2103690	0	0	25	0	2
IRZ-8	7615467	2103592	0	0	25	0	2
IRZ-9 (Extraction)	7615564	2103561	67	50	150	2	0
IRZ-10	7615528	2103456	0	0	25	0	2
IRZ-11	7615634	2103409	39	0	80	2	0
IRZ-12	7615595	2103316	0	0	25	0	2
IRZ-13	7615700	2103307	34	0	75	2	0
IRZ-14	7615644	2103189	0	0	25	0	2
IRZ-15	7615764	2103146	30	0	60	2	0
IRZ-16	7615697	2103047	28	0	60	2	0
IRZ-17	7615774	2102986	27	0	60	2	0
IRZ-18	7615738	2102900	0	0	25	0	2
IRZ-19	7615851	2102842	23	0	50	2	0
IRZ-20	7615764	2102754	21	0	50	2	0
IRZ-21	7615814	2102693	19	0	40	2	0
IRZ-22	7615782	2102612	0	0	25	0	2
IRZ-23 (Extraction)	7615820	2102538	100	50	150	2	0
IRZ-24	7615782	2102461	0	0	25	0	1
IRZ-25	7615822	2102394	17	0	35	1	0
IRZ-26	7615774	2102321	0	0	25	0	1
IRZ-27	7615799	2102239	16	0	35	1	0
IRZ-28	7615767	2102193	0	0	25	0	1
IRZ-29	7615790	2102083	14	0	30	1	0
IRZ-30	7615755	2102010	0	0	25	0	1
IRZ-31	7615788	2101947	11	0	25	1	0
IRZ-32	7615815	2101863	0	0	25	0	1
IRZ-33	7615790	2101806	10	0	25	1	0
IRZ-34	7615863	2101738	0	0	25	0	1
IRZ-35	7615901	2101665	7	0	15	1	0
IRZ-36	7615947	2101606	0	0	25	0	1
IRZ-37	7616002	2101555	4	0	10	1	0
IRZ-38	7616016	2101446	0	0	25	0	1
IRZ-39	7616075	2101401	1	0	5	1	0
IRZ-40 (Extraction)	7616137	2101368	0	0	25	0	1
Total New Well Count						32	31

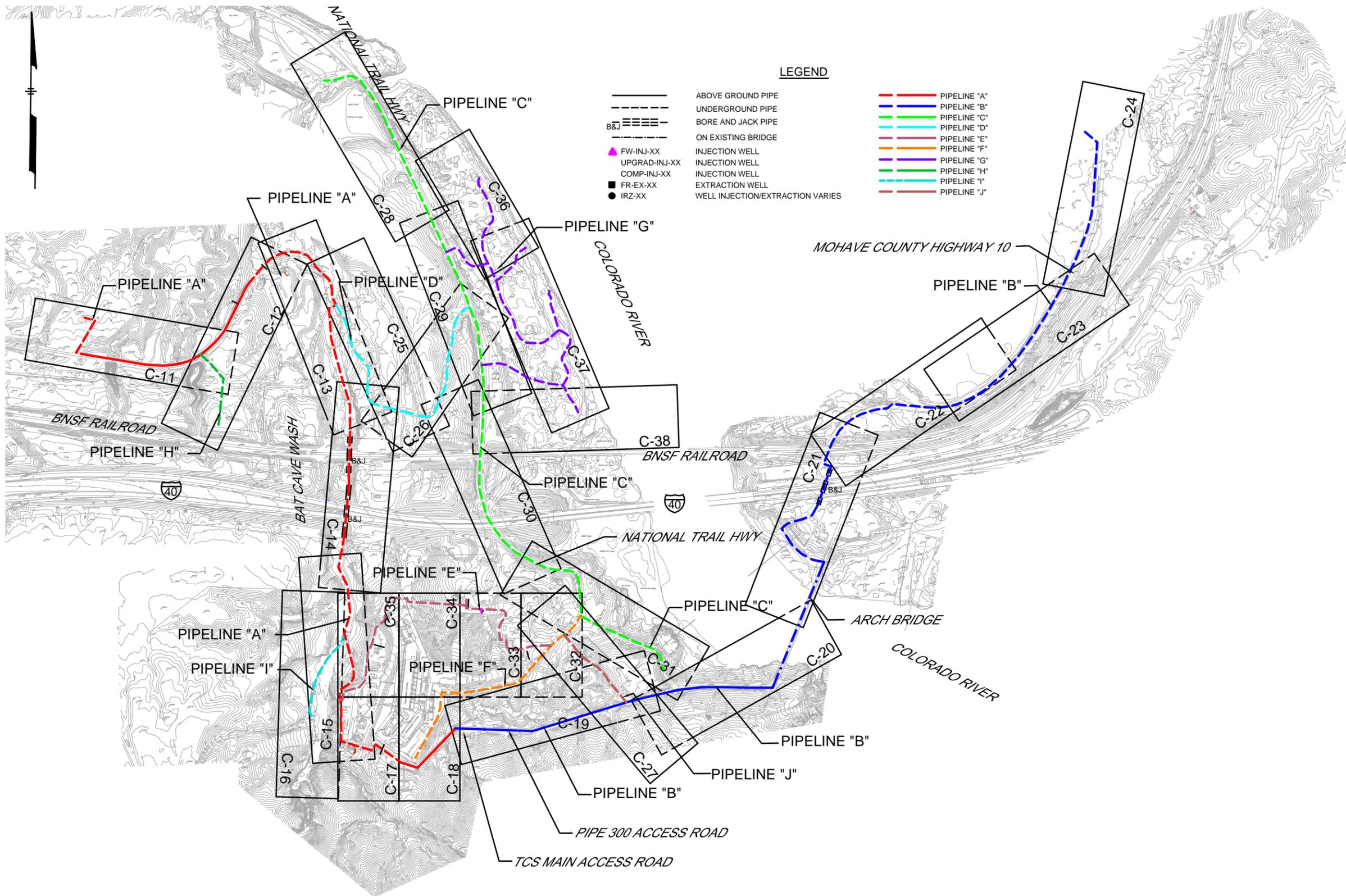
Total Preliminary New Well Count for the Groundwater Remedy (excludes new monitoring) 51
Total Preliminary Future Provisional Well Count (excludes monitoring wells) 32

¹ See Exhibit 3-1 of Draft BOD Report. PG&E is currently in discussions with the well owner about conducting hydraulic testing at the existing Topock-2 and -3 wells to provide a better estimate of the current production capacity of these wells. A pump test at the existing HNWR-1 well is being planned to confirm the production capacity of the well.

Future provisional wells are shown in italics

DATUM: HORIZONTAL:	PROJECTION:	NOV 2011 PRELIMINARY PLANS-NOT FOR CONSTRUCTION	APPRD BY:	AUTHORIZATION:	TOPOCK GROUNDWATER REMEDIATION PROJECT		JCN	_____
VERTICAL:	UNITS:						AREA	_____
REFERENCE DWGS:							COUNTY	_____
							PROFILE	_____
SCALES:	1 inch = _____						SHEET NO.	OF _____
	1 centimeter = _____						DRAWING NUMBER	CHANGE _____
							C-3	

WELL SCHEDULE
 PACIFIC GAS AND ELECTRIC COMPANY
 SAN FRANCISCO, CALIFORNIA



LEGEND

- ABOVE GROUND PIPE
- - - UNDERGROUND PIPE
- BORE AND JACK PIPE
- ON EXISTING BRIDGE
- ▲ FW-INJ-XX INJECTION WELL
- ▲ UPGRAD-INJ-XX INJECTION WELL
- ▲ COMP-INJ-XX INJECTION WELL
- FR-EX-XX EXTRACTION WELL
- IRZ-XX WELL INJECTION/EXTRACTION VARIES

- PIPELINE "A"
- PIPELINE "B"
- PIPELINE "C"
- PIPELINE "D"
- PIPELINE "E"
- PIPELINE "F"
- PIPELINE "G"
- PIPELINE "H"
- PIPELINE "I"
- PIPELINE "J"

FOLD

FOLD

DATUM: HORIZONTAL:		PROJECTION:		NOV 2011 PRELIMINARY PLANS-NOT FOR CONSTRUCTION		APPROD BY:		AUTHORIZATION:	
VERTICAL:		UNITS:							
REFERENCE DWGS:									
SCALES: 1 inch = 300'		1 centimeter =		NO. DATE DESCRIPTION		APPROD. NO. DATE DESCRIPTION		APPROD. NO. DATE DESCRIPTION	
				REVISIONS					

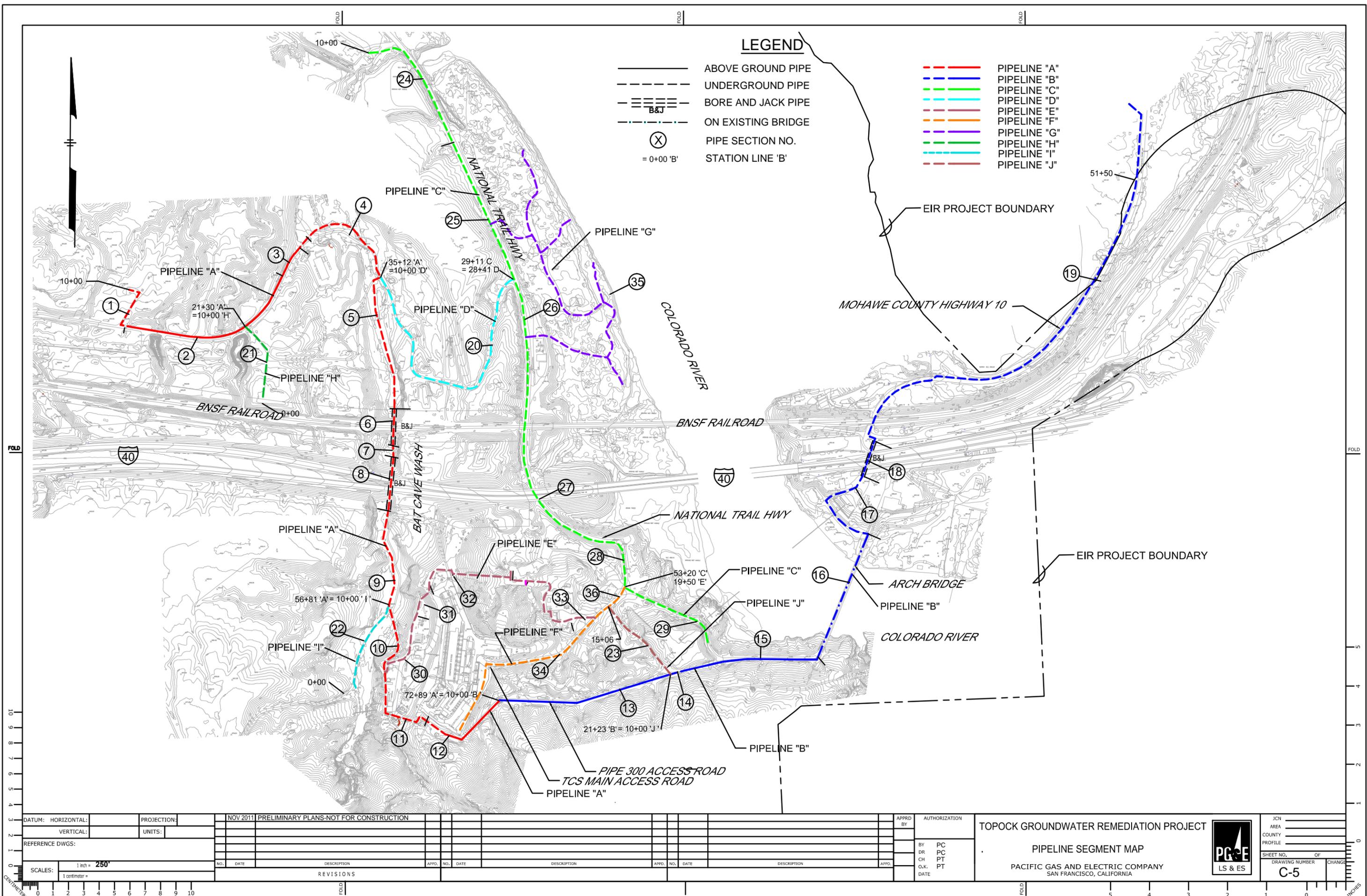
TOPEAK GROUNDWATER REMEDIATION PROJECT

PIPELINE KEY MAP

PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

JCN	AREA	COUNTY	PROFILE
SHEET NO.	OF	DRAWING NUMBER	CHANGE
		C-4	





DATUM:	HORIZONTAL:	PROJECTION:	NOV 2011	PRELIMINARY PLANS-NOT FOR CONSTRUCTION
	VERTICAL:	UNITS:		
REFERENCE DWGS:				
SCALES:	1 inch = 250'			
	1 centimeter =			

NO.	DATE	DESCRIPTION	APPD.	NO.	DATE	DESCRIPTION	APPD.	NO.	DATE	DESCRIPTION	APPD.
REVISIONS											

TOPOCK GROUNDWATER REMEDIATION PROJECT

PIPELINE SEGMENT MAP

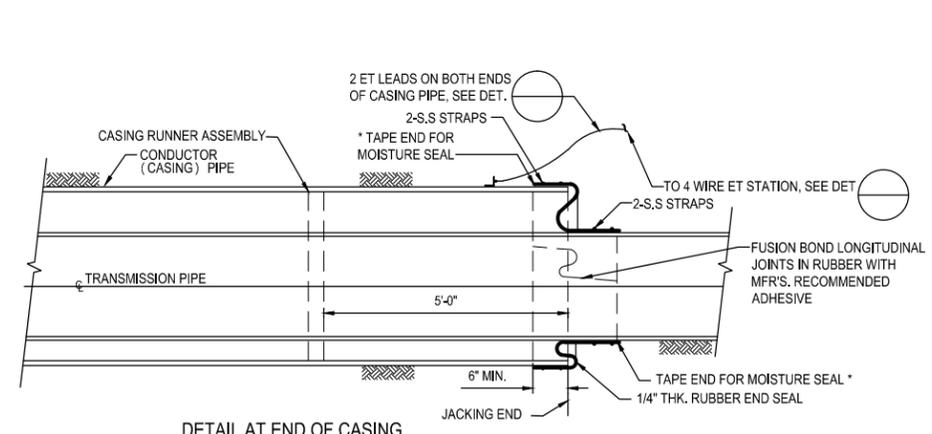
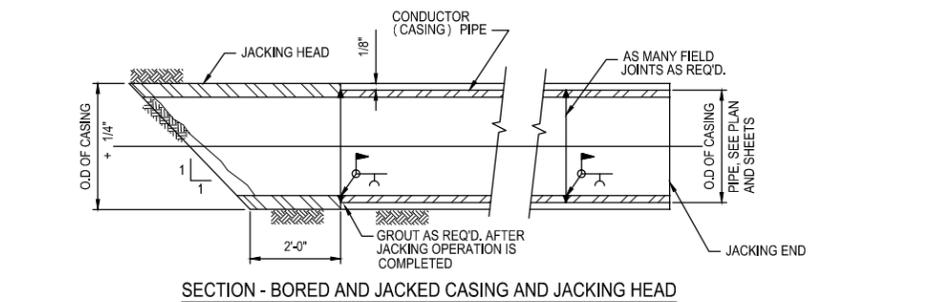
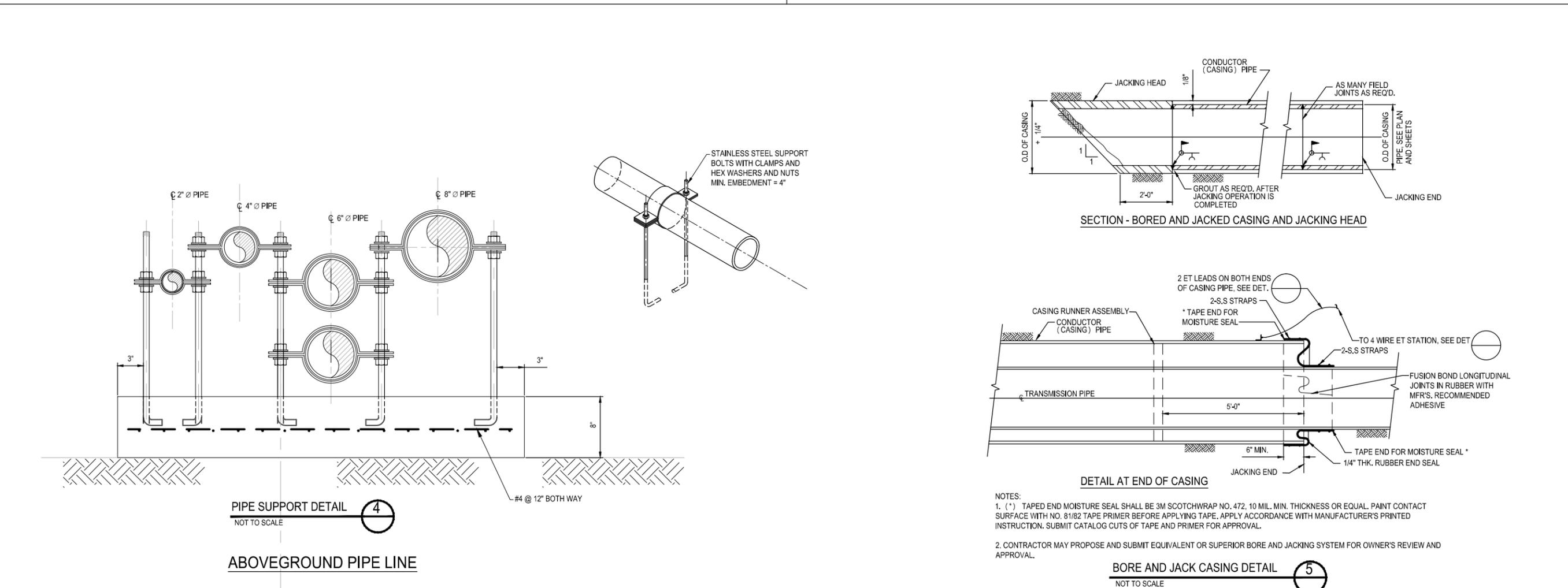
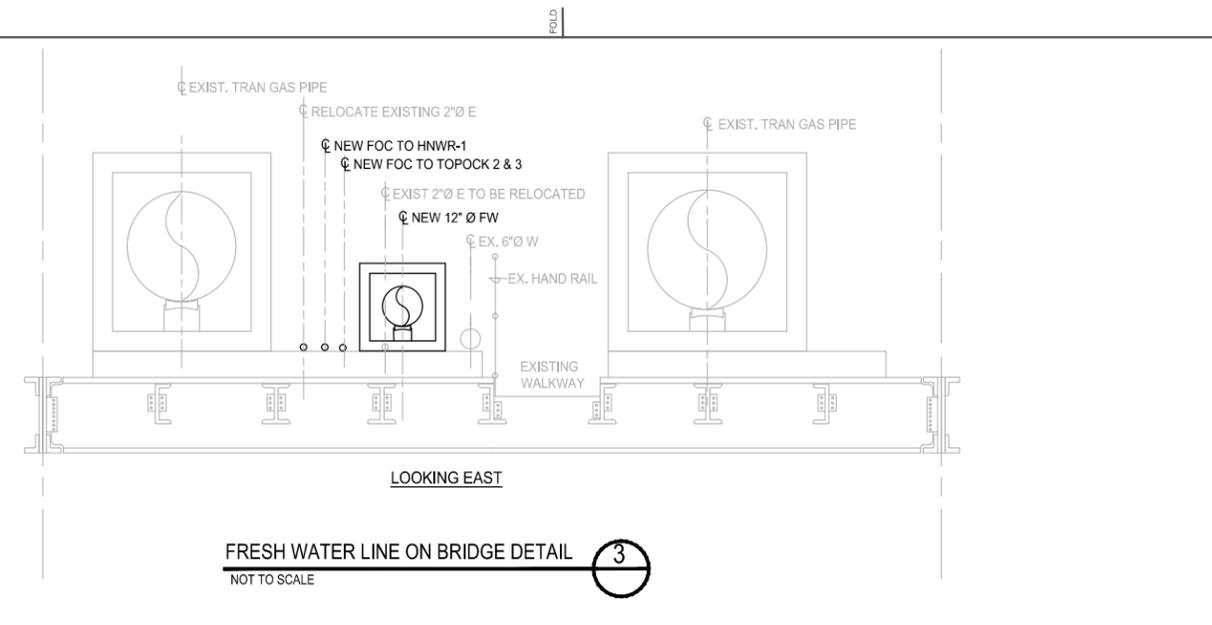
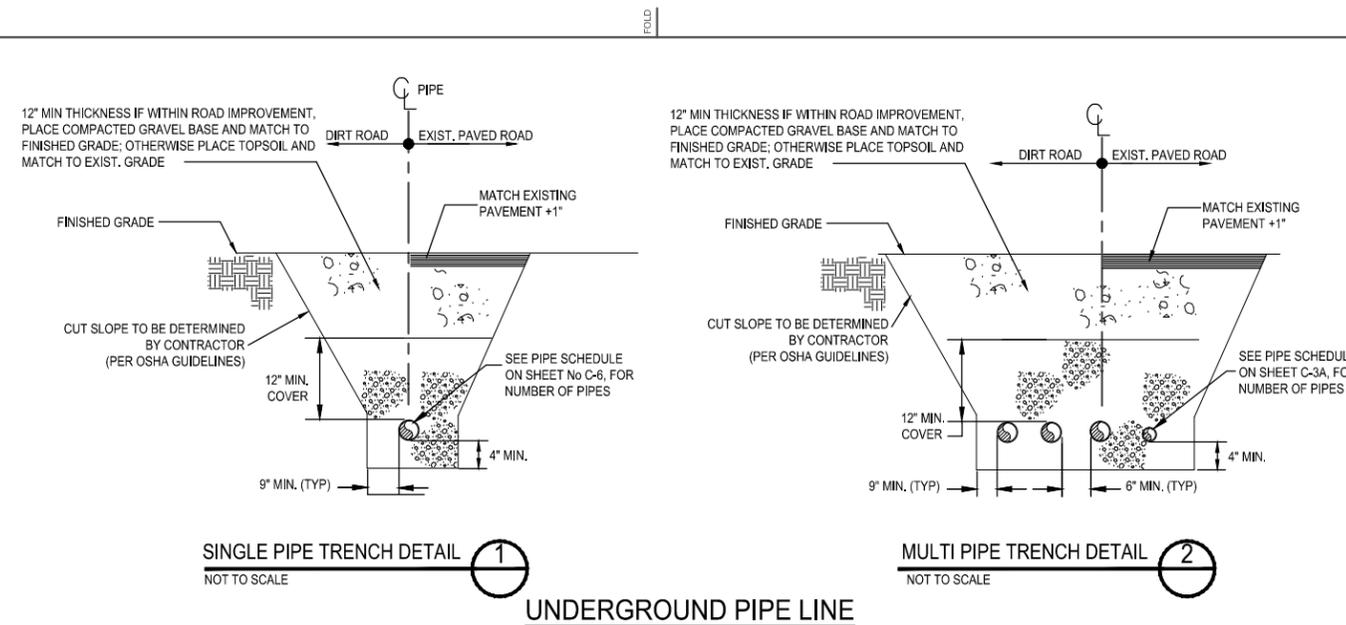
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

JCN	AREA	COUNTY	PROFILE
SHEET NO.	OF	DRAWING NUMBER	CHANGE
		C-5	

Pipe Section No.	Pipe Line	Beg Sta	End Sta	Total Length	Construction Method				Pipe Service (Diameter in inches)								
					UT	AG	BJ	BA	FW	RW	TW	CA	EX	IRZ	CIP	ELECT	INST
1	A	10+00	13+83	383	383				6	6						4	2
2	A	13+83	21+30	747		747			6	6						4	2
3	A	21+30	27+04	574		574			8	6		4				4	2
4	A	27+04	35+12	808	808				8	6		4				4	2
5	A	35+12	44+00	888	888				8	6						4	2
6	A	44+00	46+37	237			237		8	6						4	2
7	A	46+37	47+15	78	78				8	6						4	2
8	A	47+15	50+46	331			331		8	6						4	2
9	A	50+46	56+81	635	635				8	6						4	2
10	A	56+81	61+80	499	499				8	6	2					4	2
11	A	61+80	68+39	659		659			8	6	2					4	2
12	A	68+39	72+89	450		450			6		3					4	2
13	B	10+00	21+23	1123			1123		6								2
14	B	21+23	22+19	96	96				12								2
15	B	22+19	30+71	852		852			12								2
16	B	30+71	39+38	867				867	12								2
17	B	39+38	45+96	658	658				12								2
18	B	45+96	48+32	236			236		12								2
19	B	48+32	80+44	3212	3212				12								2
20	D	10+00	28+41	1841	1841				6			4				4	2
21	H	10+00	15+43	543	543				4	6						4	2
22	I	10+00	15+92	592	592				4	4						4	2
23	J	10+00	15+98	598	598											4	2
24	C	10+00	17+51	751	751				4	6	2					4	2
25	C	17+51	23+69	618	618				4	6	2			2	2	4	2
26	C	23+69	27+18	349	349				4	6	2	4		2	2	4	2
27	C	27+18	30+71	353	353				6	6	2			2	2	4	2
28	C	30+71	44+29	1358	1358				6	6	4					4	2
29	C	44+29	50+25	596	596				6	6	4					4	2
30	C	50+25	56+96	671	671				6	6			2			4	2
31	E	10+00	15+81	581	581				3	2						4	2
32	E	15+81	22+91	710	710											4	2
33	E	22+91	29+16	625	625							2				4	2
34	E	29+16	31+33	217	217							2				4	2
35	F	10+00	12+57	1257	1257					6	4					4	2
36	F	12+57	13+79	122	122				2	6	4					4	2
37	F	13+79	15+34	155	155				2	6	4					4	2
38	G	0+00	5+94	594	594							4				4	2
39	G	5+94	6+91	97	97							4				4	2
40	G	6+91	13+81	690	690							4				4	2
41	G	13+81	17+95	414	414							4				4	2
42	G	17+95	19+92	197	197							4				4	2
43	G	10+00	13+49	349	349							4				4	2
44	G	10+00	12+94	294	294							4				4	2
45	G	10+00	15+51	551	551							4				4	2
46	G	10+00	12+51	251	251							4				4	2
Totals				28707	22631	4405	804	867	21863	13785	7167	3572	4950	1320	1320	21663	28707

UT - Underground Trench, AG - Above Ground Piping, BJ - Bore and Jack, BA - Bridge Attachment
 FW - Freshwater, RW - Remedy Wastewater (force main), TW - Treated Water, CA - Carbon Amended Water (FW, TW or EX treated with carbon), EX - Extracted water (from wells),
 IRZ - Insitu reactive zone (water recirculated from IRZ wells), CIP (Clean in place water main), ELECT - Electrical power and distribution conduit, INST - Instrumentation and control wiring

DATUM: HORIZONTAL: _____ VERTICAL: _____		PROJECTION: _____ UNITS: _____	NOV 2011 PRELIMINARY PLANS-NOT FOR CONSTRUCTION	APPR. BY: _____ AUTHORIZATION: _____		TOPOCK GROUNDWATER REMEDIATION PROJECT PIPE SCHEDULE PACIFIC GAS AND ELECTRIC COMPANY SAN FRANCISCO, CALIFORNIA		JCN: _____ AREA: _____ COUNTY: _____ PROFILE: _____
REFERENCE DWGS: _____ _____ _____		NO. DATE DESCRIPTION REVISIONS	APPR. NO. DATE DESCRIPTION _____ _____ _____	BY: PC DR: PC CH: PT O.K.: PT DATE: _____	SHEET NO. _____ OF _____ DRAWING NUMBER _____ C-6			

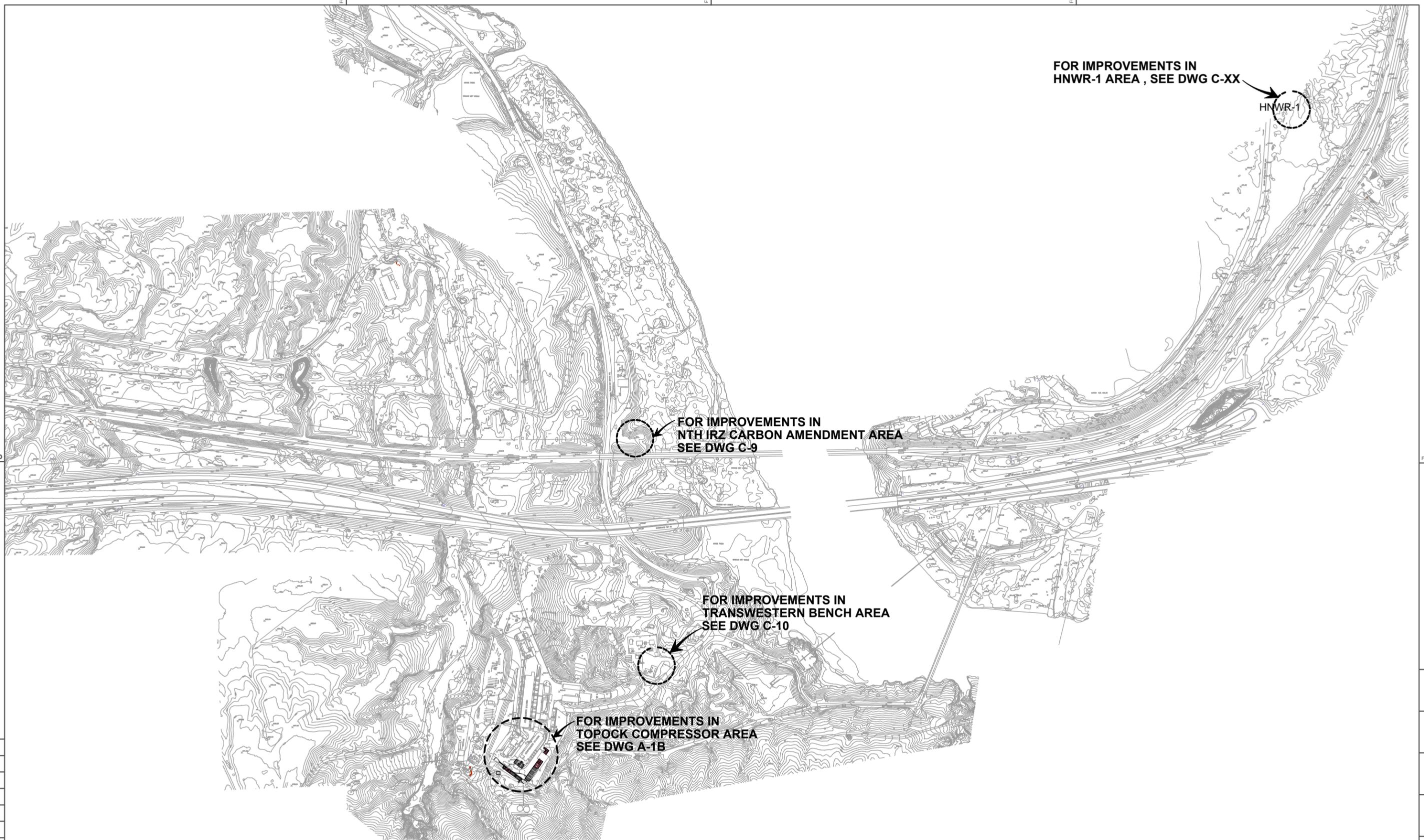


NOTES:
 1. (*) TAPED END MOISTURE SEAL SHALL BE 3M SCOTCHWRAP NO. 472, 10 MIL. MIN. THICKNESS OR EQUAL. PAINT CONTACT SURFACE WITH NO. 81/82 TAPE PRIMER BEFORE APPLYING TAPE. APPLY ACCORDANCE WITH MANUFACTURER'S PRINTED INSTRUCTION. SUBMIT CATALOG CUTS OF TAPE AND PRIMER FOR APPROVAL.
 2. CONTRACTOR MAY PROPOSE AND SUBMIT EQUIVALENT OR SUPERIOR BORE AND JACKING SYSTEM FOR OWNER'S REVIEW AND APPROVAL.

BORE AND JACK CASING DETAIL 5
 NOT TO SCALE

DATUM: HORIZONTAL:		PROJECTION:		NOV 2011 PRELIMINARY PLANS-NOT FOR CONSRUCTION		APPRD BY:		AUTHORIZATION:		TOPOCK GROUNDWATER REMEDIATION PROJECT		JCN AREA COUNTY PROFILE	
VERTICAL:		UNITS:								TYPICAL TRENCH DETAIL		SHEET NO. OF	
REFERENCE DWGS:										PACIFIC GAS AND ELECTRIC COMPANY SAN FRANCISCO, CALIFORNIA		DRAWING NUMBER OF CHANGE	
SCALES: 1 inch = 1 centimeter =				NO. DATE DESCRIPTION		APPRD. NO. DATE DESCRIPTION		BY: PC DR: PC CH: PT O.K.: PT DATE:		LS & ES		C-7	

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FOR IMPROVEMENTS IN
HNWR-1 AREA , SEE DWG C-XX

HNWR-1

FOR IMPROVEMENTS IN
NTH IRZ CARBON AMENDMENT AREA
SEE DWG C-9

FOR IMPROVEMENTS IN
TRANSWESTERN BENCH AREA
SEE DWG C-10

FOR IMPROVEMENTS IN
TOPOCK COMPRESSOR AREA
SEE DWG A-1B

DATUM: HORIZONTAL:		PROJECTION:		NOV 2011 PRELIMINARY PLANS-NOT FOR CONSTRUCTION		APPROD BY:		AUTHORIZATION:	
VERTICAL:		UNITS:							
REFERENCE DWGS:									
SCALES: 1 inch = 250'		NO. DATE		DESCRIPTION		APPROD. NO. DATE		DESCRIPTION	
1 centimeter =		REVISIONS							

TOPOCK GROUNDWATER REMEDIATION PROJECT

OVERALL CIVIL SITE PLAN

PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

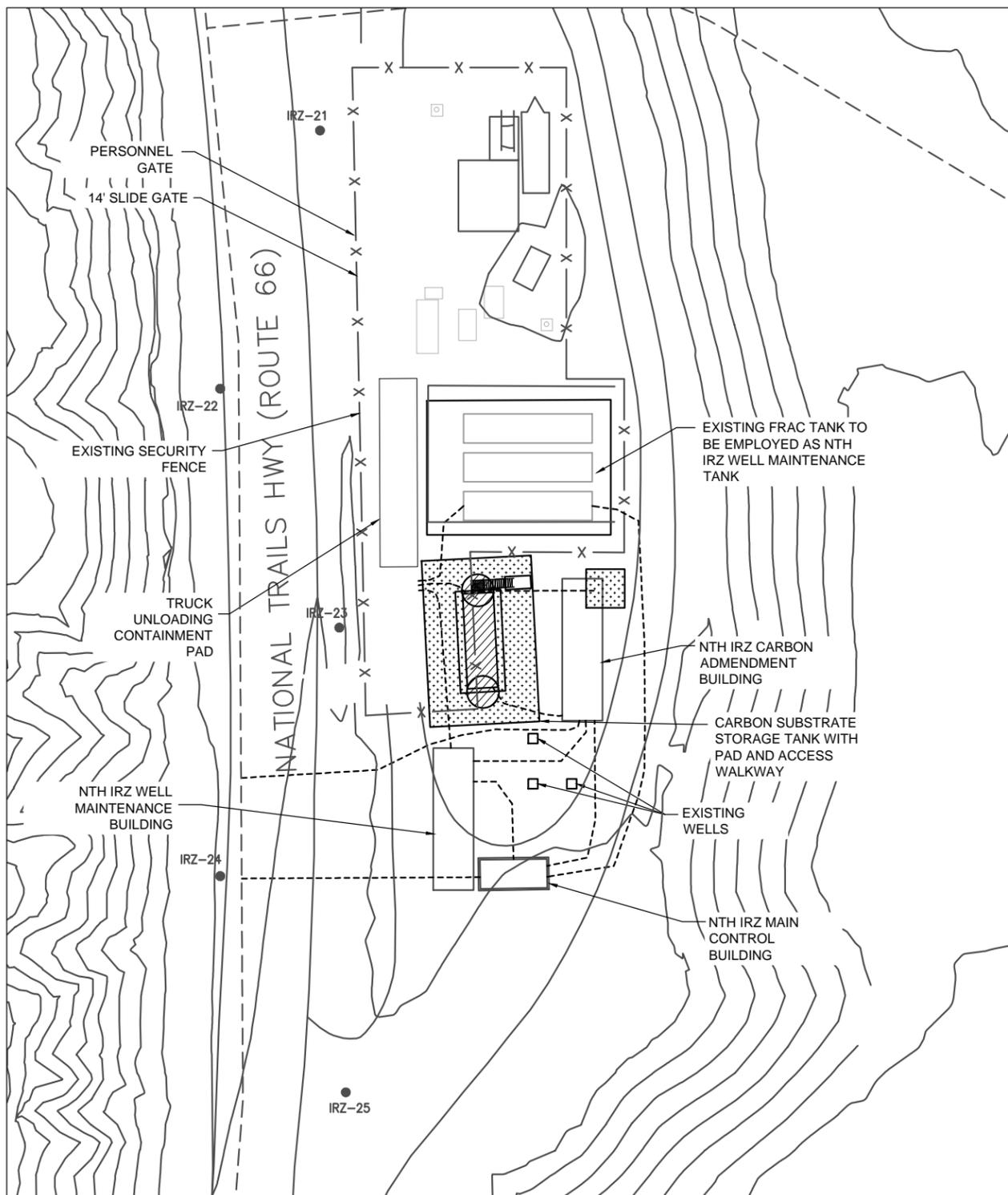


JCN	AREA	COUNTY	PROFILE
SHEET NO.	OF	DRAWING NUMBER	CHANGE
		C-8	



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- NOTES:
1. ELECTRICAL HAZARD CLASSIFICATIONS:
 - A. CLASS I, DIV I WITHIN A 5-FT RADIUS OF THE CARBON STORAGE TANK VENTS.
 - B. CLASS I, DIV II WITHIN A 10-FT RADIUS OF THE CARBON STORAGE TANK VENTS (FROM VENT ELEVATION TO GROUND).
 - C. CLASS I, DIV II FROM GROUND SURFACE TO 18-INCHES ABOVE GRADE WITHIN A 10-FT RADIUS OF THE TANK FOOTPRINT.
 - D. CLASS I, DIV II WITHIN THE CARBON AMENDMENT BUILDING WHERE DOSING LINES CONTAIN >10% EIOH, FIRE RATED WALLS MAY BE USED TO MINIMIZE THE FOOTPRINT OF THE CLASSIFIED AREA.
 - E. CLASS I, DIV II WITHIN A 10-FT RADIUS OF THE VENTS OF THE EQUIVALENT HAZ CLASS LOCATIONS WITHIN THE BUILDING.
 2. CARBON AMENDMENT AND WELL MAINTENANCE BUILDING FOUNDATIONS INCLUDE A 6" CONCRETE CURB TO PROVIDE SECONDARY CONTAINMENT FOR PROCESSES WITHIN BUILDINGS.
 3. ENTIRE NTH IRZ FACILITY WILL BE ENCLOSED WITHIN A SECURITY FENCE TO BE FULLY SHOWN IN LATER DRAWING SET REVISIONS.

LEGEND

 CLASS I, DIV I

 CLASS I, DIV II



DATUM: HORIZONTAL:	PROJECTION:	NOV 2011 PRELIMINARY PLANS - NOT FOR CONSTRUCTION	APPRD BY:	AUTHORIZATION:
VERTICAL:	UNITS:		BY: JF	
REFERENCE DWGS:			DR: GD	
			CH: JB	
SCALES: 1 inch =			O.K.: JF	
1 centimeter =			DATE:	
REVISIONS				
NO.	DATE	DESCRIPTION	APPRD. NO.	DATE

TOPOCK GROUNDWATER REMEDIATION PROJECT

NTH IRZ CARBON AMENDMENT AREA PLAN

PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

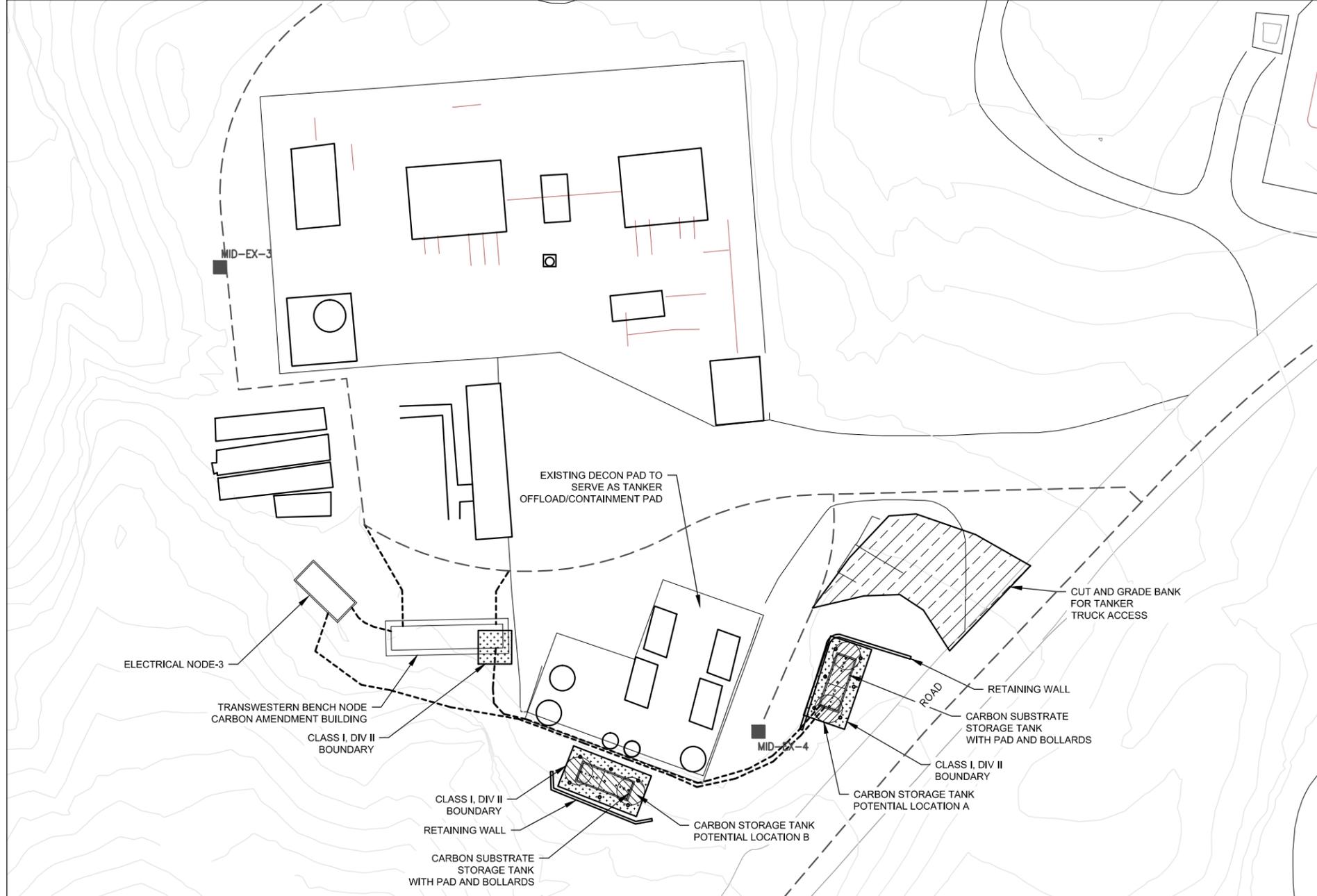


JCN _____
AREA _____
COUNTY _____
PROFILE _____

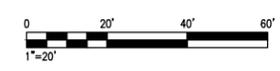
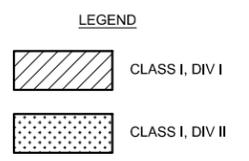
SHEET NO. _____ OF _____
DRAWING NUMBER _____ CHANGE _____
C-9



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- NOTES:
- ELECTRICAL HAZARD CLASSIFICATIONS:
 - CLASS I, DIV I WITHIN A 5-FT RADIUS OF THE CARBON STORAGE TANK VENTS.
 - CLASS I, DIV II WITHIN A 10-FT RADIUS OF THE CARBON STORAGE TANK VENTS (FROM VENT ELEVATION TO GROUND).
 - CLASS I, DIV II FROM GROUND SURFACE TO 18-INCHES ABOVE GRADE WITHIN A 10-FT RADIUS OF THE TANK FOOTPRINT.
 - CLASS I, DIV II WITHIN THE CARBON AMENDMENT BUILDING WHERE DOSING LINES CONTAIN >10% EtOH, FIRE RATED WALLS MAY BE USED TO MINIMIZE THE FOOTPRINT OF THE CLASSIFIED AREA.
 - CLASS I, DIV II WITHIN A 10-FT RADIUS OF THE VENTS OF THE EQUIVALENT HAZ CLASS LOCATIONS WITHIN THE BUILDING.
 - CARBON AMENDMENT BUILDING FOUNDATION INCLUDES A 6" CONCRETE CURB TO PROVIDE SECONDARY CONTAINMENT FOR PROCESSES WITHIN BUILDING.



DATUM: HORIZONTAL:	PROJECTION:	NOV 2011 PRELIMINARY PLANS - NOT FOR CONSTRUCTION	APPRD BY:	AUTHORIZATION:
VERTICAL:	UNITS:		BY: JF	
REFERENCE DWGS:			DR: GD	
			CH: JB	
			O.K.: JF	
			DATE:	

TOPOCK GROUNDWATER REMEDIATION PROJECT

TW BENCH CARBON AMENDMENT AREA PLAN

PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

JCN _____
AREA _____
COUNTY _____
PROFILE _____

SHEET NO. _____ OF _____
DRAWING NUMBER _____ CHANGE _____
C-10

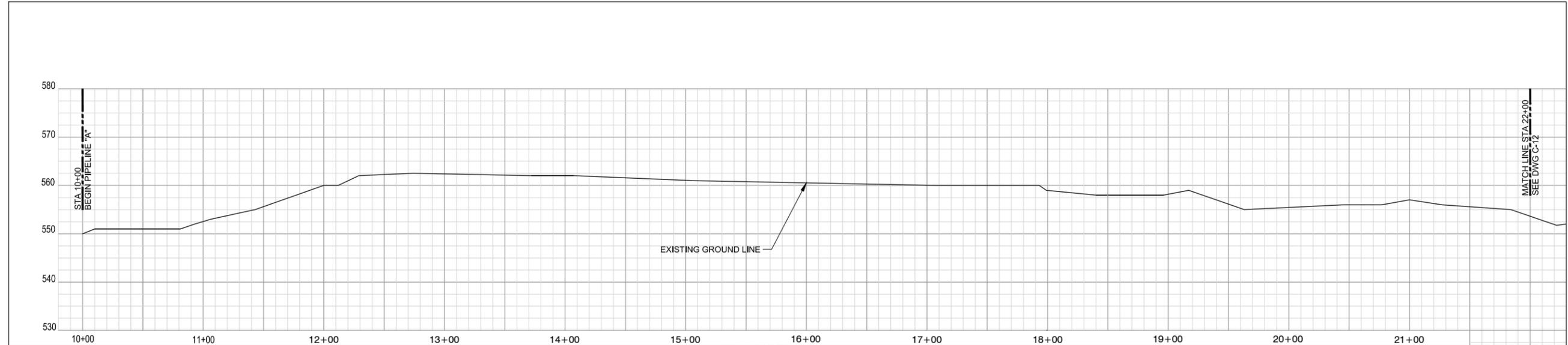


LEGEND

- EXISTING UNDERGROUND LINE
- - - NEW UNDERGROUND LINE
- — — EXISTING ABOVE GROUND LINE
- — — NEW ABOVE GROUND LINE
- — — EXISTING BORE AND JACK
- — — NEW BORE AND JACK
- — — EXISTING BRIDGE ATTACHMENT
- — — NEW BRIDGE ATTACHMENT
- ▲ FW-INJ-XX INJECTION WELL
- ▲ UPGRAD-INJ-XX INJECTION WELL
- ▲ COMP-INJ-XX INJECTION WELL
- FR-EX-XX EXTRACTION WELL
- IRZ-XX WELL INJECTION/EXTRACTION VARIES
- PI POINT OF INTERSECTION
- AP ANGLE POINT (HORIZ)
- GB GRADE BREAK
- BOP BOTTOM OF PIPE

NOTE:
SEE PIPELINE KEY MAP AND PIPE
SCHEDULE ON DRAWINGS C-5 AND C-6,
FOR NUMBER AND SIZE OF PIPES.

PLAN
SCALE 1"=40'



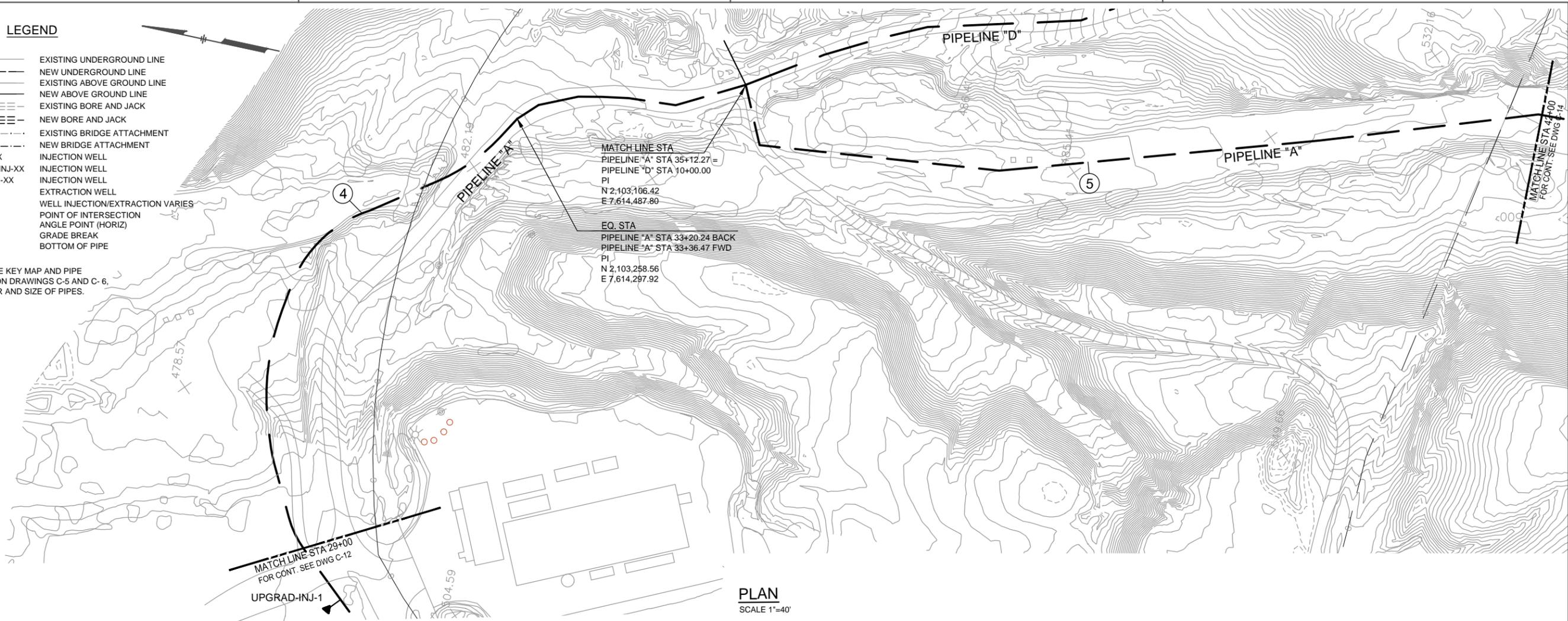
PROFILE
SCALES: HORIZ 1"=40'
VERT 1"=10'

DATUM: HORIZONTAL:		PROJECTION:		NOV 2011 PRELIMINARY PLANS (NOT FOR CONSTRUCTION)												APPRD BY:		AUTHORIZATION:		TOPOCK GROUNDWATER REMEDIATION PROJECT PLAN AND PROFILE PIPE LINE "A"- STA 10+00 TO STA 22+00 PACIFIC GAS AND ELECTRIC COMPANY SAN FRANCISCO, CALIFORNIA						JCN		AREA		COUNTY		PROFILE	
VERTICAL:		UNITS:		NO.		DATE		DESCRIPTION		APPRD. NO.		DATE		DESCRIPTION		APPRD.		BY:								DATE		SHEET NO. OF		DRAWING NUMBER		CHANGE	
SCALES: 1 inch = 40' Horizontal, 1 inch = 10' Vertical 1 centimeter = 10'				REVISIONS												EE EE PT PT		DATE		C-11		0		0		0		0					

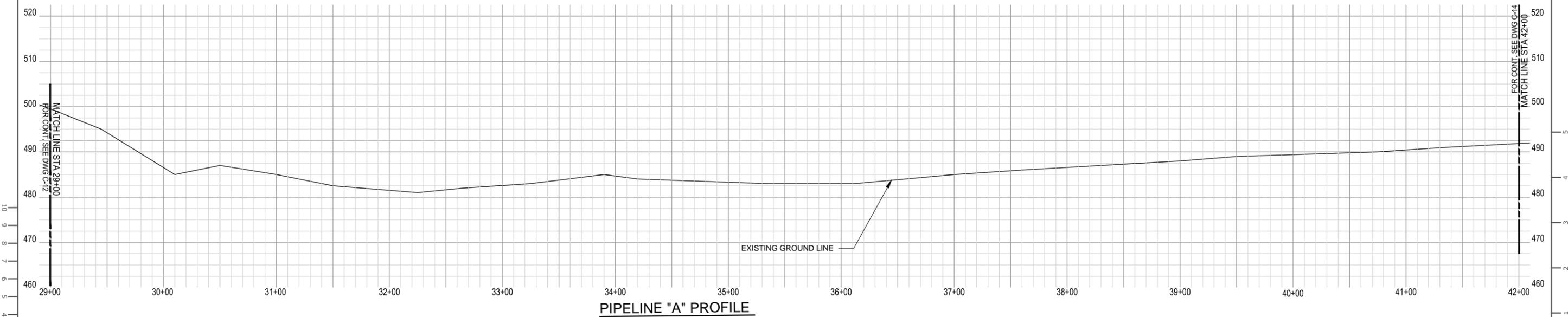
LEGEND

- EXISTING UNDERGROUND LINE
- - - NEW UNDERGROUND LINE
- EXISTING ABOVE GROUND LINE
- - - NEW ABOVE GROUND LINE
- EXISTING BORE AND JACK
- - - NEW BORE AND JACK
- - - EXISTING BRIDGE ATTACHMENT
- - - NEW BRIDGE ATTACHMENT
- ▲ FW-INJ-XX INJECTION WELL
- ▲ UPGRAD-INJ-XX INJECTION WELL
- ▲ COMP-INJ-XX INJECTION WELL
- FR-EX-XX EXTRACTION WELL
- IRZ-XX WELL INJECTION/EXTRACTION VARIES
- PI POINT OF INTERSECTION
- AP ANGLE POINT (HORIZ)
- GB GRADE BREAK
- BOP BOTTOM OF PIPE

NOTE:
SEE PIPELINE KEY MAP AND PIPE
SCHEDULE ON DRAWINGS C-5 AND C-6,
FOR NUMBER AND SIZE OF PIPES.

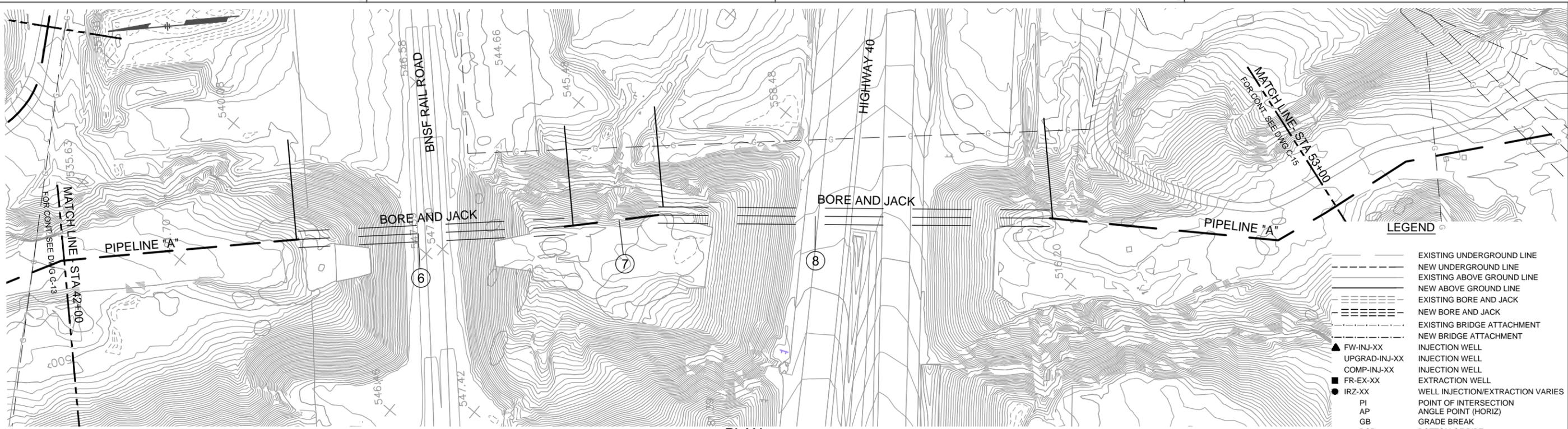


PLAN
SCALE 1"=40'



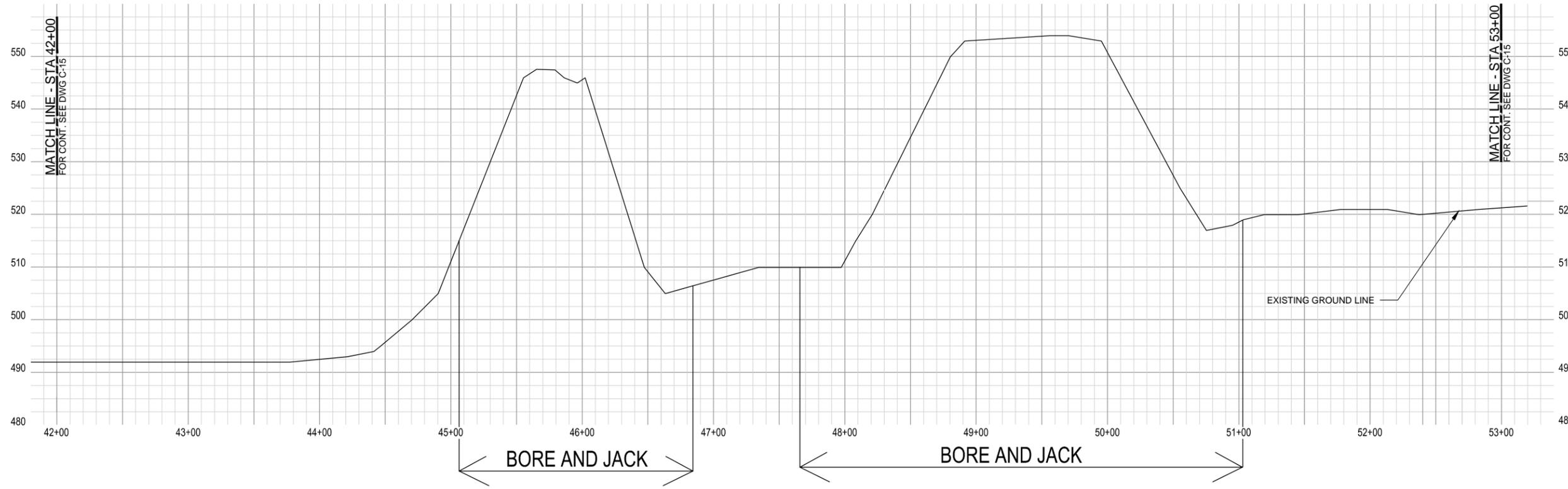
PIPELINE "A" PROFILE

DATUM: HORIZONTAL: _____ VERTICAL: _____ REFERENCE DWGS: _____ SCALES: 1 inch = 40' HORZ. 10' VERT.		PROJECTION: _____ UNITS: _____ NO. DATE DESCRIPTION APPD. NO. DATE DESCRIPTION APPD. NO. DATE DESCRIPTION APPD. NO. DATE DESCRIPTION		NOV 2011 PRELIMINARY PLANS-NOT FOR CONSTRUCTION APPR BY: _____ AUTHORIZATION: _____ BY: EE DR: EE CH: PT O.K.: PT DATE: _____		TOPOCK GROUNDWATER REMEDIATION PROJECT PLAN AND PROFILE PIPELINE "A" - STA 29+00 TO STA 42+00 PACIFIC GAS AND ELECTRIC COMPANY SAN FRANCISCO, CALIFORNIA		ICN: _____ AREA: _____ COUNTY: _____ PROFILE: _____ SHEET NO. OF: _____ DRAWING NUMBER: C-13 CHANGE: _____	
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PLAN
SCALE 1"=40'

NOTE:
SEE PIPELINE KEY MAP AND PIPE
SCHEDULE ON DRAWINGS C-5 AND C-6,
FOR NUMBER AND SIZE OF PIPES.



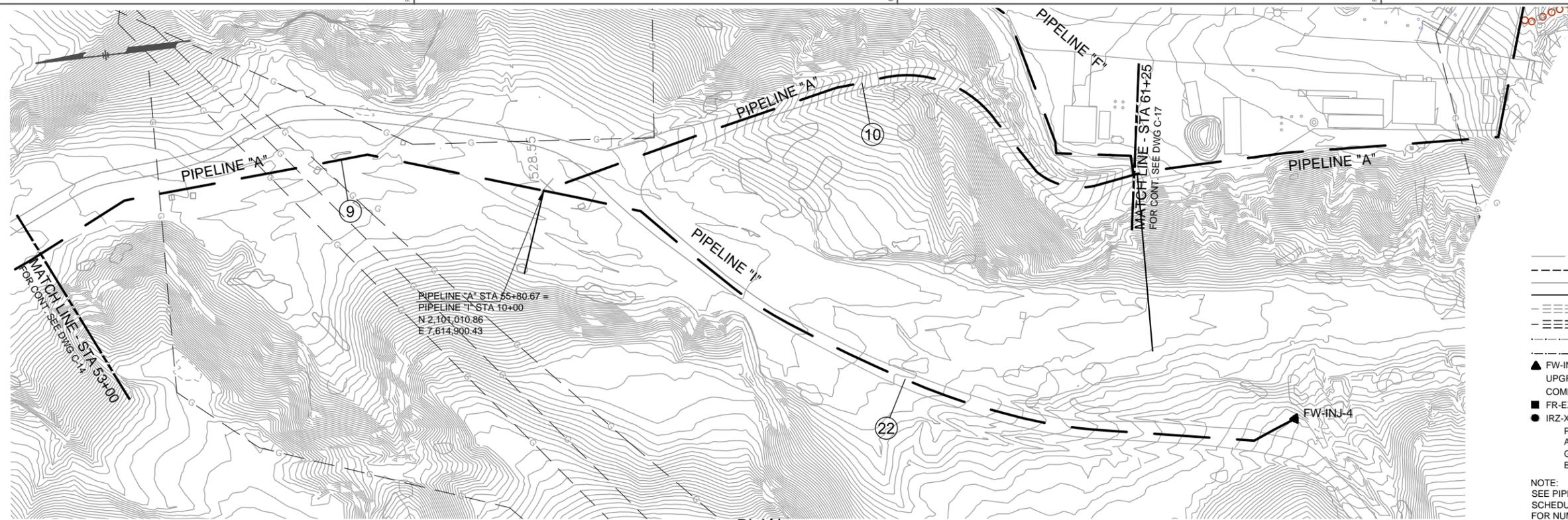
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VERTICAL:		UNITS:							
REFERENCE DWGS:									
SCALES: 1 inch = 40' Horizontal, 1 inch = 10' Vertical									
1 centimeter =									
REVISIONS		NO. DATE DESCRIPTION		APPRD. NO. DATE DESCRIPTION		APPRD. NO. DATE DESCRIPTION		APPRD. NO. DATE DESCRIPTION	

TOPOCK GROUNDWATER REMEDIATION PROJECT

PLAN AND PROFILE
PIPE LINE 'A' - STA 42+00 TO STA 53+00

PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

ICN	AREA	COUNTY	PROFILE
SHEET NO.	OF	DRAWING NUMBER	CHANGE
		C-14	

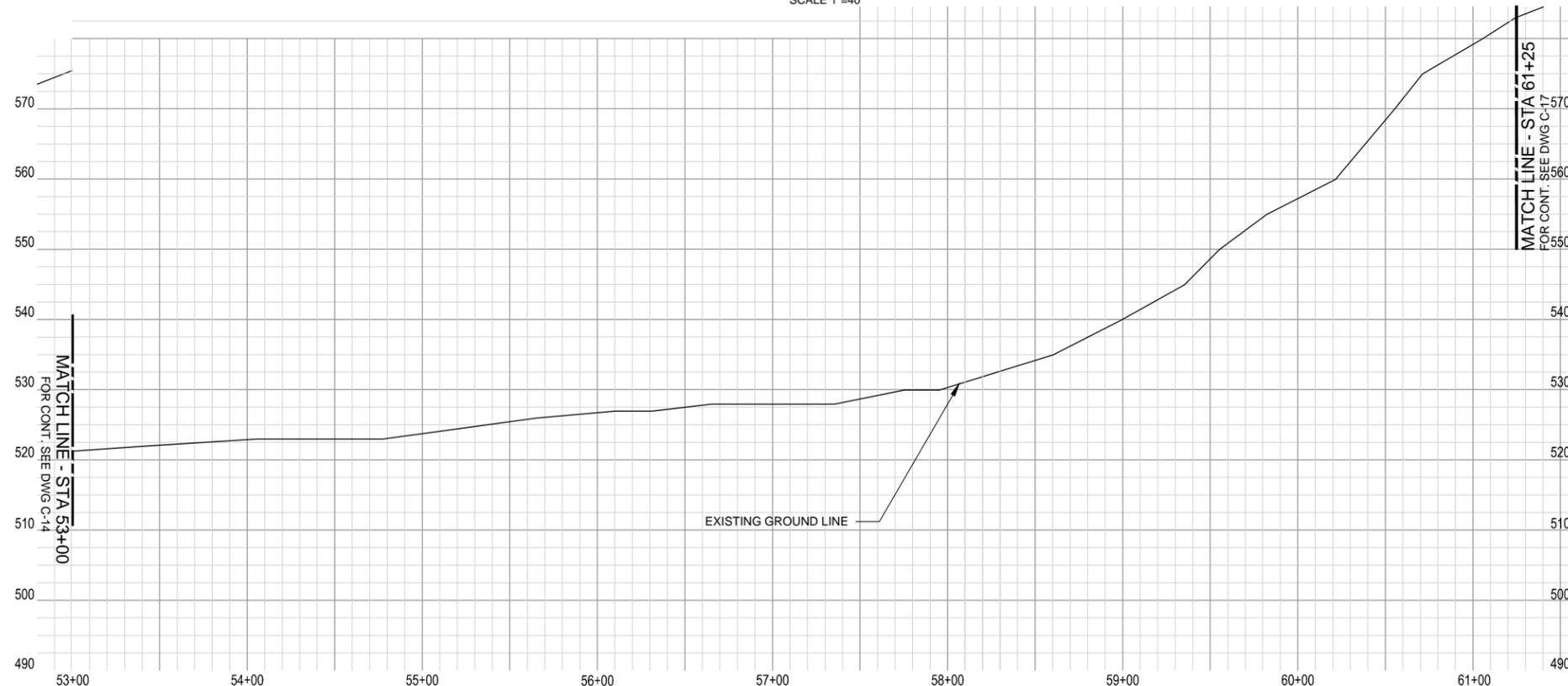


PLAN
SCALE 1"=40'

LEGEND

- — — — — EXISTING UNDERGROUND LINE
- - - - - NEW UNDERGROUND LINE
- — — — — EXISTING ABOVE GROUND LINE
- — — — — NEW ABOVE GROUND LINE
- — — — — EXISTING BORE AND JACK
- — — — — NEW BORE AND JACK
- - - - - EXISTING BRIDGE ATTACHMENT
- - - - - NEW BRIDGE ATTACHMENT
- ▲ FW-INJ-XX INJECTION WELL
- ▲ UPGRAD-INJ-XX INJECTION WELL
- ▲ COMP-INJ-XX INJECTION WELL
- FR-EX-XX EXTRACTION WELL
- IRZ-XX WELL INJECTION/EXTRACTION VARIES
- PI POINT OF INTERSECTION
- AP ANGLE POINT (HORIZ)
- GB GRADE BREAK
- BOP BOTTOM OF PIPE

NOTE:
SEE PIPELINE KEY MAP AND PIPE
SCHEDULE ON DRAWINGS C-5 AND C-6,
FOR NUMBER AND SIZE OF PIPES.



PIPELINE "A" PROFILE

DATUM: HORIZONTAL:		PROJECTION:		NOV 2011 PRELIMINARY PLANS-NOT FOR CONSTRUCTION		APPRD BY:		AUTHORIZATION	
VERTICAL:		UNITS:							
REFERENCE DWGS:				NO.		DATE		DESCRIPTION	
SCALES: 1 inch = 40' Horizontal, 1 inch = 10' Vertical				NO.		DATE		DESCRIPTION	
1 centimeter =				REVISIONS		APPRD.		NO. DATE DESCRIPTION	

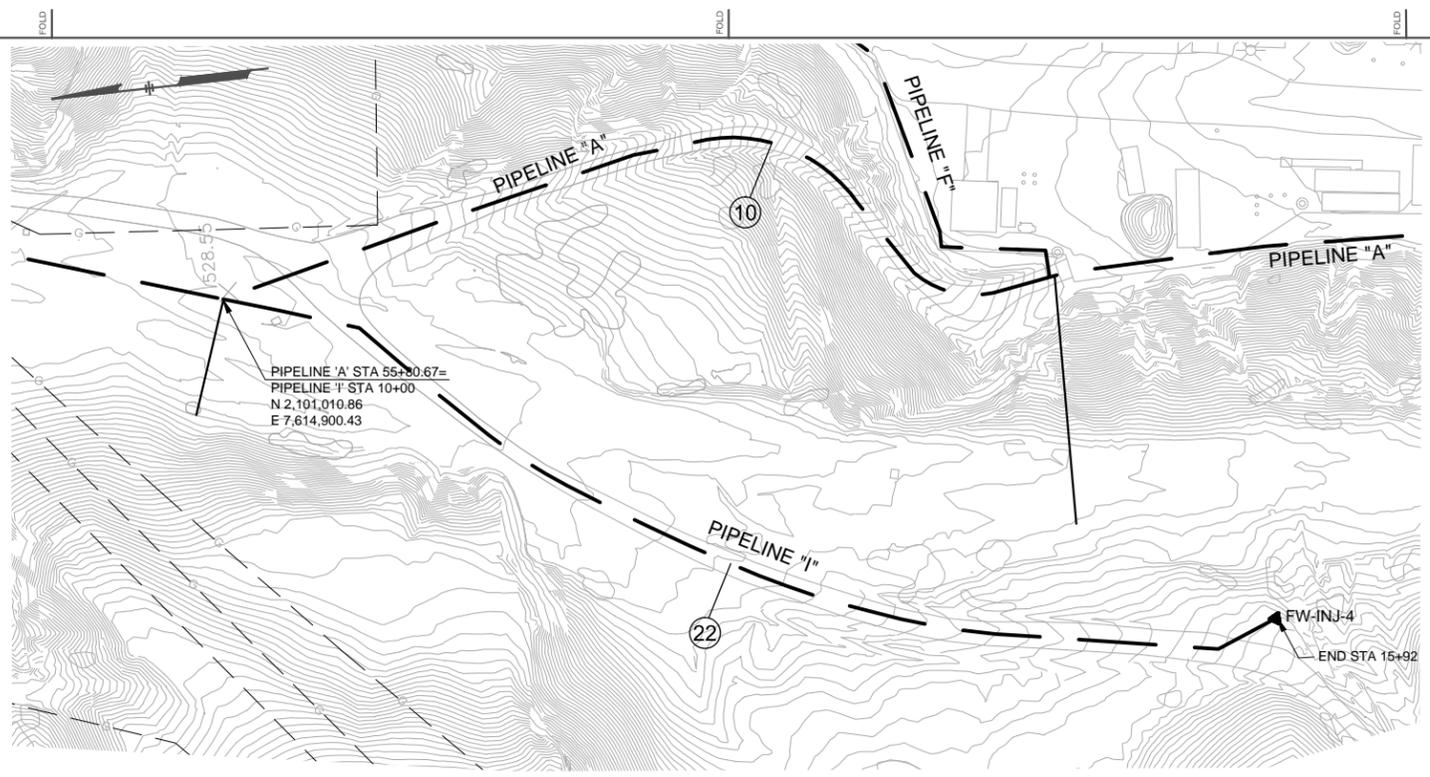
TOPOCK GROUNDWATER REMEDIATION PROJECT
PLAN AND PROFILE
PIPELINE "A" - STA 53+00 TO STA 61+25

PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

PG&E
LS & ES

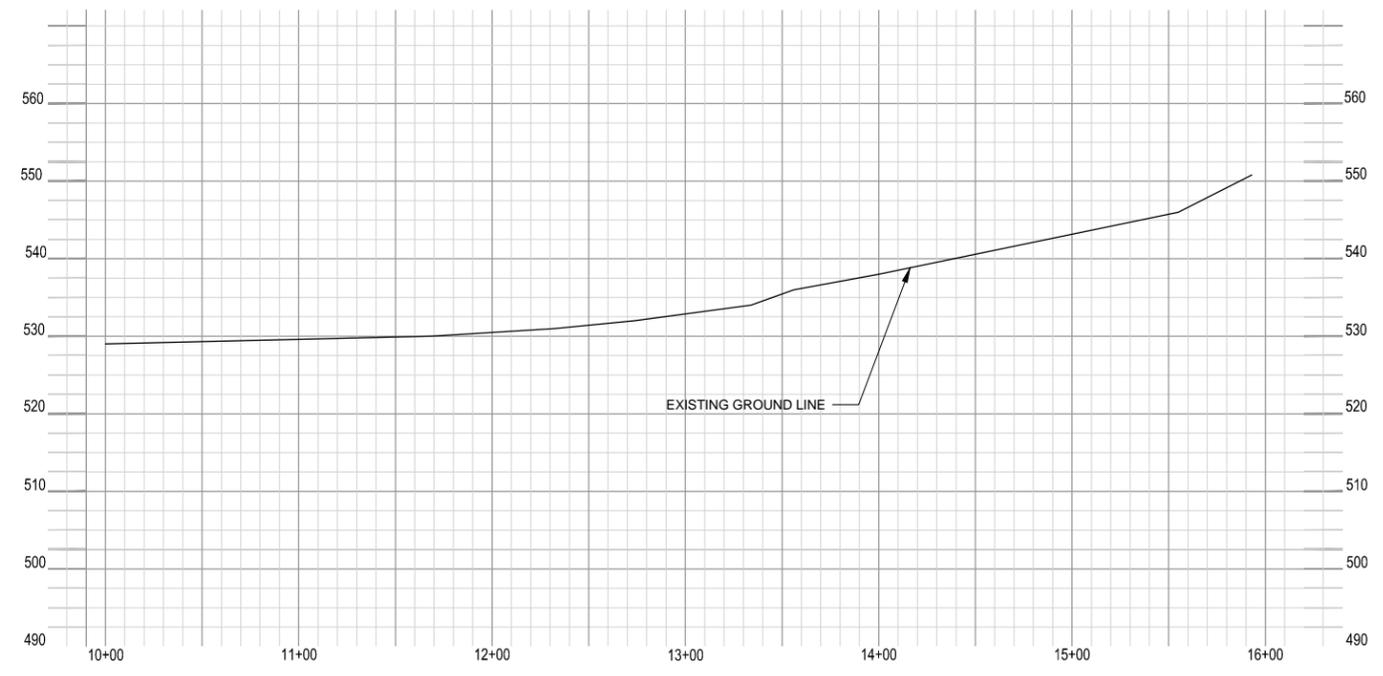
JCN _____
 AREA _____
 COUNTY _____
 PROFILE _____

SHEET NO. _____ OF _____
 DRAWING NUMBER _____
C-15



- LEGEND**
- EXISTING UNDERGROUND LINE
 - - - NEW UNDERGROUND LINE
 - EXISTING ABOVE GROUND LINE
 - NEW ABOVE GROUND LINE
 - EXISTING BORE AND JACK
 - NEW BORE AND JACK
 - - - EXISTING BRIDGE ATTACHMENT
 - - - NEW BRIDGE ATTACHMENT
 - ▲ FW-INJ-XX INJECTION WELL
 - ▲ UPGRAD-INJ-XX INJECTION WELL
 - ▲ COMP-INJ-XX INJECTION WELL
 - FR-EX-XX EXTRACTION WELL
 - IRZ-XX WELL INJECTION/EXTRACTION VARIES
 - PI POINT OF INTERSECTION
 - AP ANGLE POINT (HORIZ)
 - GB GRADE BREAK
 - BOP BOTTOM OF PIPE

NOTE:
SEE PIPELINE KEY MAP AND PIPE
SCHEDULE ON DRAWINGS C-5 AND C-6,
FOR NUMBER AND SIZE OF PIPES.



PIPELINE "I" PROFILE
 SCALES : HORIZ 1"=40'
 VERT 1"=10'

DATUM: HORIZONTAL:		PROJECTION: NOV 2011		PRELIMINARY PLANS-NOT FOR CONSTRUCTION		APPRD BY:		AUTHORIZATION:		TOPOCK GROUNDWATER REMEDIATION PROJECT PLAN AND PROFILE PIPELINE "I"- STA 10+00 TO STA 15+92 PACIFIC GAS AND ELECTRIC COMPANY SAN FRANCISCO, CALIFORNIA		JCIN _____ AREA _____ COUNTY _____ PROFILE _____	
VERTICAL:		UNITS:										SHEET NO. _____ OF _____ DRAWING NUMBER _____ C-16	
REFERENCE DWGS:													
SCALES: 1 inch = 40' Horizontal, 1 inch = 10' Vertical 1 centimeter = _____													
REVISIONS													

NOTE: YARD PIPING IS NOT PROFILED ON THIS SHEET.

LEGEND

- EXISTING UNDERGROUND LINE
- - - NEW UNDERGROUND LINE
- - - EXISTING ABOVE GROUND LINE
- - - NEW ABOVE GROUND LINE
- EXISTING BORE AND JACK
- NEW BORE AND JACK
- EXISTING BRIDGE ATTACHMENT
- NEW BRIDGE ATTACHMENT
- FW-INJ-XX INJECTION WELL
- PI POINT OF INTERSECTION
- AP ANGLE POINT (HORIZ)
- GB GRADE BREAK
- BOP BOTTOM OF PIPE

INSTALL STUB AND BLIND FLANGE ON RW FOR FUTURE CONNECTION TO INFLUENT STORAGE TANKS.

MATCH LINE
PIPE LINE "A" STA 61+25.
FOR CONT. SEE DWG C-15

MATCH LINE - FOR CONT. SEE C-35

MATCH LINE - FOR CONT. SEE C-18

FOLD

FOLD

DATUM: HORIZONTAL:	PROJECTION:	NOV 2011 PRELIMINARY PLANS-NOT FOR CONSTRUCTION
VERTICAL:	UNITS:	
REFERENCE DWGS:		
SCALES: 1 inch = 20'		
1 centimeter =		

NO.	DATE	DESCRIPTION	APPR.	NO.	DATE	DESCRIPTION	APPR.	NO.	DATE	DESCRIPTION
REVISIONS										

APPRD BY	AUTHORIZATION
BY	PC
DR	PC
CH	PT
O.K.	PT
DATE	

TOPOCK GROUNDWATER REMEDIATION PROJECT

TCS AREA PLAN 1

PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA



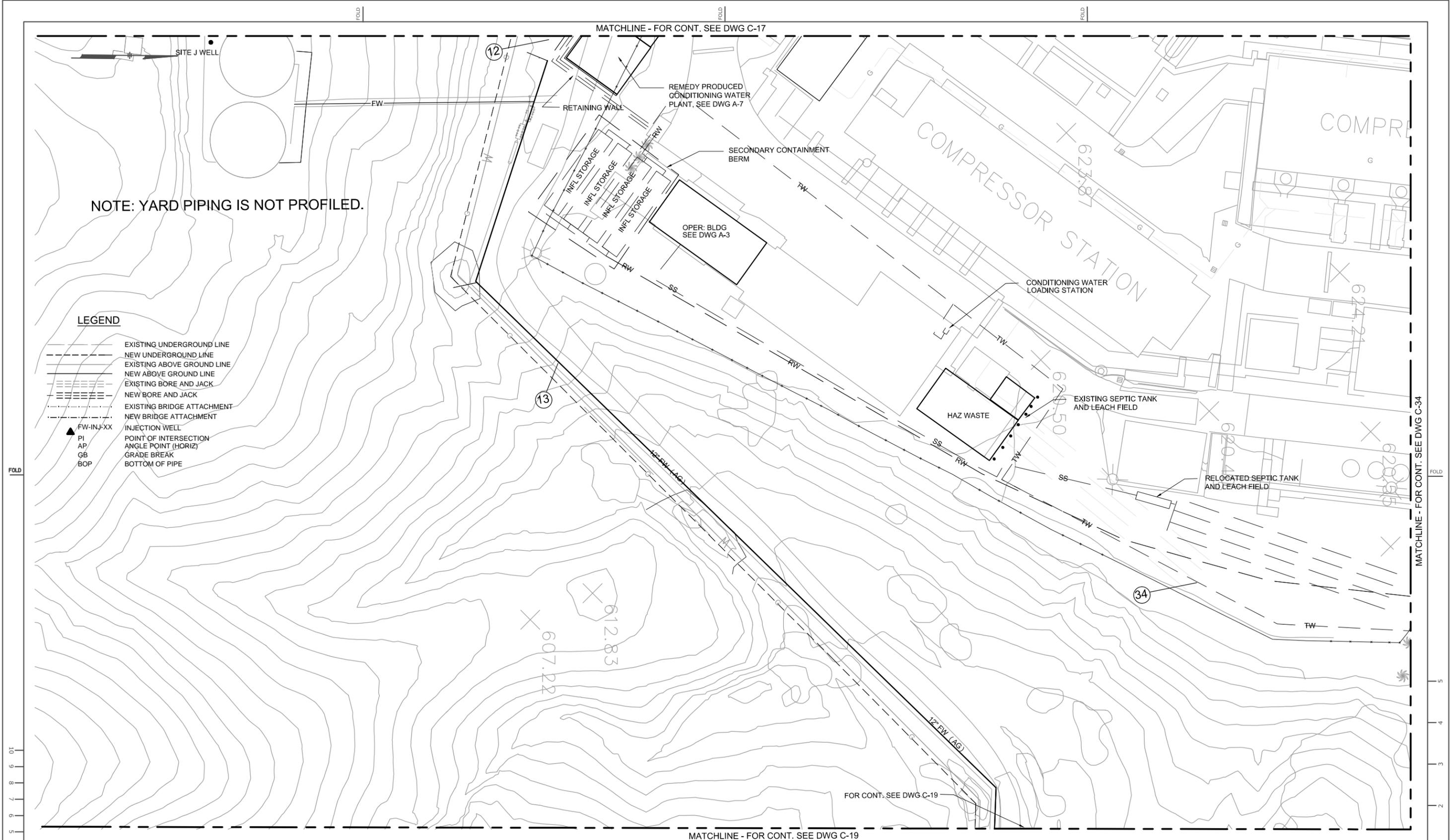
JCN
AREA
COUNTY
PROFILE

SHEET NO. OF
DRAWING NUMBER CHANGE

C-17

10
9
8
7
6
5
4
3
2
1
0
CENTIMETERS

5
4
3
2
1
0
INCHES



NOTE: YARD PIPING IS NOT PROFILED.

LEGEND

- EXISTING UNDERGROUND LINE
- - - NEW UNDERGROUND LINE
- EXISTING ABOVE GROUND LINE
- - - NEW ABOVE GROUND LINE
- EXISTING BORE AND JACK
- - - NEW BORE AND JACK
- EXISTING BRIDGE ATTACHMENT
- - - NEW BRIDGE ATTACHMENT
- ▲ FW-INJ-XX INJECTION WELL
- PI POINT OF INTERSECTION
- AP ANGLE POINT (HORIZ)
- GB GRADE BREAK
- BOP BOTTOM OF PIPE

DATUM: HORIZONTAL:	PROJECTION:	NOV 2011 PRELIMINARY PLANS-NOT FOR CONSTRUCTION
VERTICAL:	UNITS:	
REFERENCE DWGS:		
SCALES: 1 inch = 20'-0"		
1 centimeter =		

NO.	DATE	DESCRIPTION	APPD.	NO.	DATE	DESCRIPTION	APPD.	NO.	DATE	DESCRIPTION
REVISIONS										

APPRD BY	AUTHORIZATION
BY	PC
DR	PC
CH	PT
O.K.	PT
DATE	

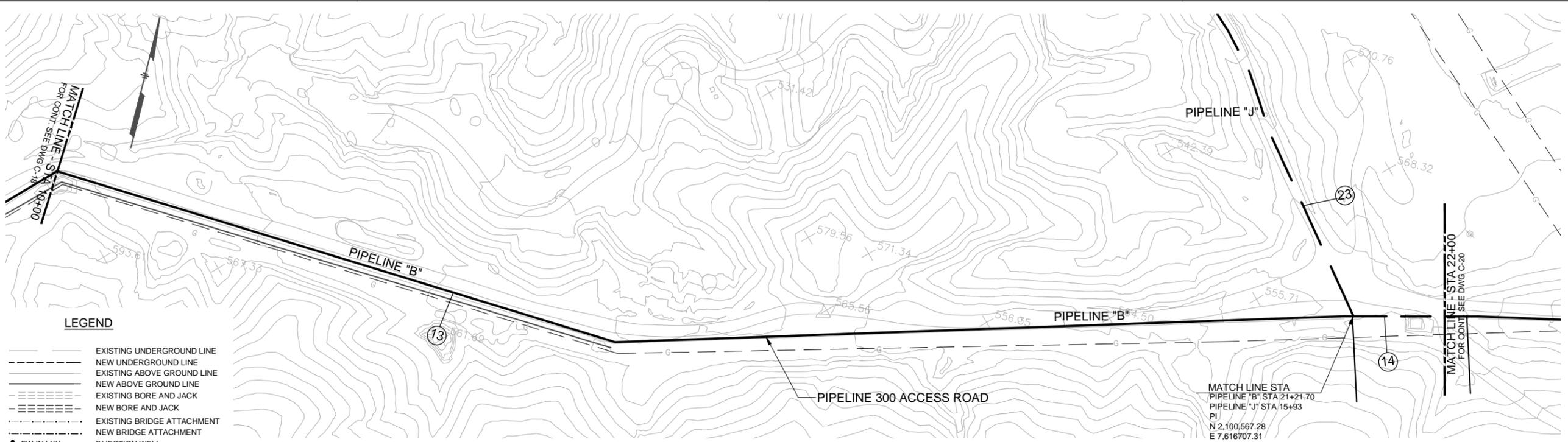
TOPOCK GROUNDWATER REMEDIATION PROJECT

TCS AREA PLAN 2

PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA



JCN	AREA	COUNTY	PROFILE
SHEET NO.	OF	DRAWING NUMBER	CHANGE
		C-18	

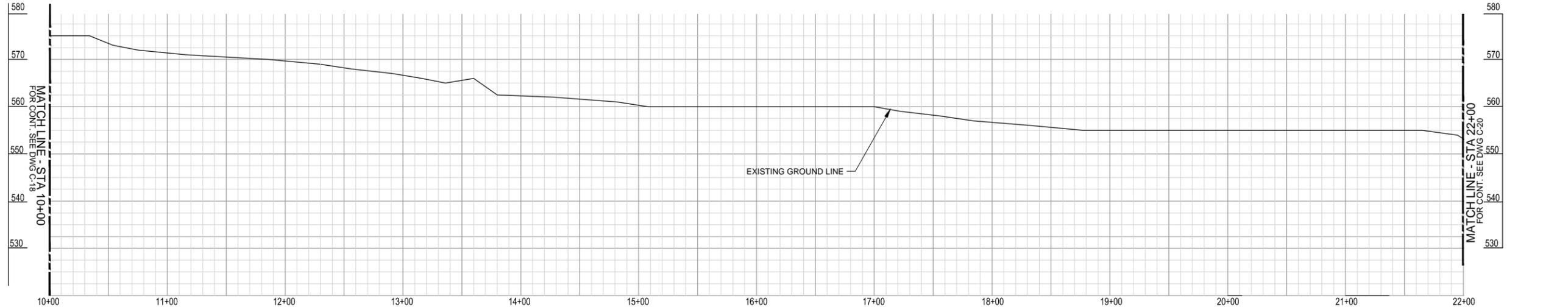


LEGEND

- EXISTING UNDERGROUND LINE
- - - NEW UNDERGROUND LINE
- EXISTING ABOVE GROUND LINE
- - - NEW ABOVE GROUND LINE
- ||||| EXISTING BORE AND JACK
- ||||| NEW BORE AND JACK
- - - EXISTING BRIDGE ATTACHMENT
- - - NEW BRIDGE ATTACHMENT
- ▲ FW-INJ-XX INJECTION WELL
- ▲ UPGRAD-INJ-XX INJECTION WELL
- ▲ COMP-INJ-XX INJECTION WELL
- FR-EX-XX EXTRACTION WELL
- IRZ-XX WELL INJECTION/EXTRACTION VARIES
- PI POINT OF INTERSECTION
- AP ANGLE POINT (HORIZ)
- GB GRADE BREAK
- BOP BOTTOM OF PIPE

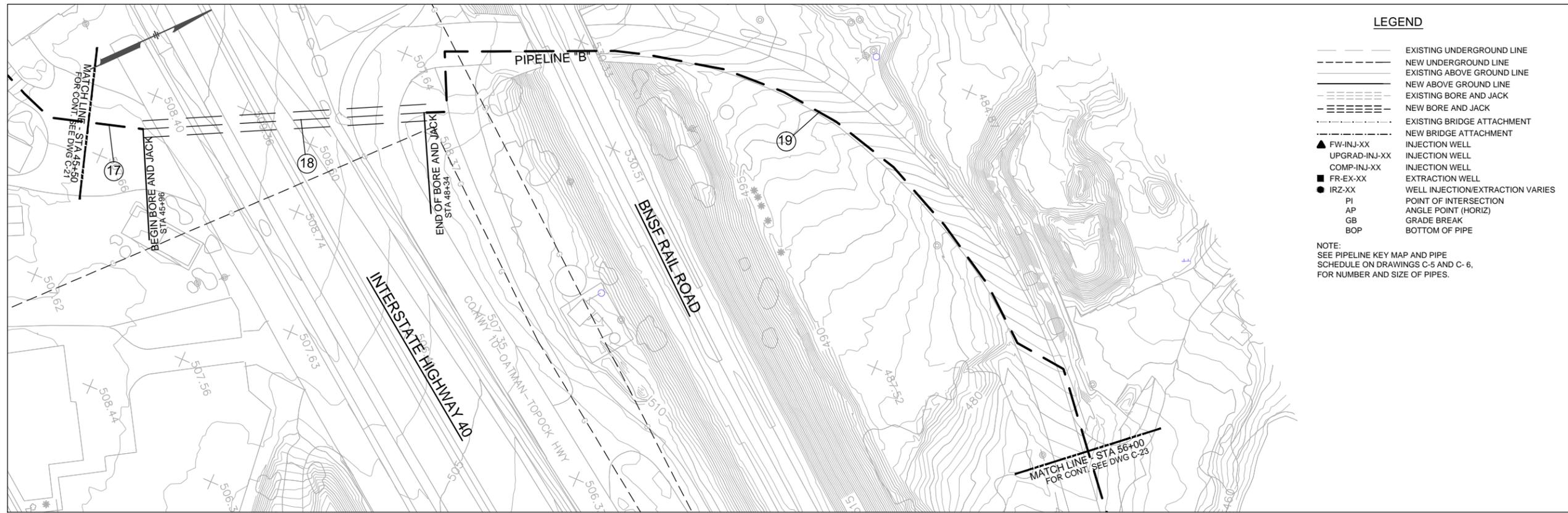
NOTE:
SEE PIPELINE KEY MAP AND PIPE
SCHEDULE ON DRAWINGS C-5 AND C-6,
FOR NUMBER AND SIZE OF PIPES.

PLAN



PIPELINE "B" PROFILE

DATUM: HORIZONTAL: PROJECTION:		NOV 2011 PRELIMINARY PLANS-NOT FOR CONSTRUCTION		APPRD BY:		AUTHORIZATION:		TOPOCK GROUNDWATER REMEDIATION PROJECT PLAN AND PROFILE PIPE LINE "B" - STA 10+00 TO STA 22+00 PACIFIC GAS AND ELECTRIC COMPANY SAN FRANCISCO, CALIFORNIA		JCIN: _____ AREA: _____ COUNTY: _____ PROFILE: _____	
VERTICAL: UNITS:										SHEET NO. OF _____ DRAWING NUMBER OF _____ C-19	
REFERENCE DWGS:		NO. DATE DESCRIPTION APPD. NO. DATE		REVISIONS							
SCALES: 1 inch = 40' HORT. 10' VERT. 1 centimeter =											

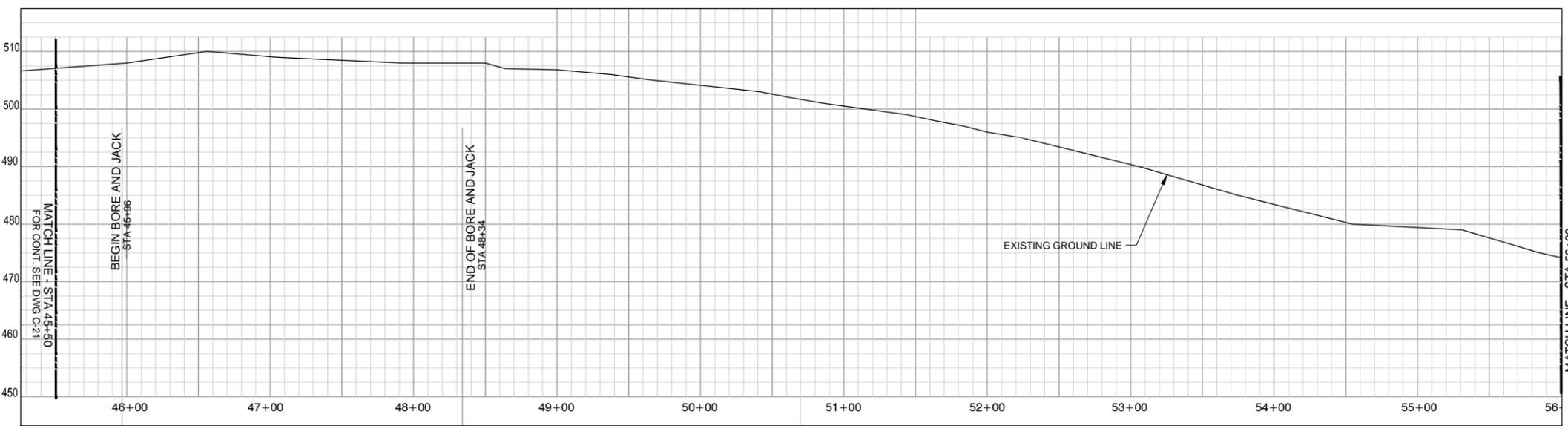


LEGEND

- EXISTING UNDERGROUND LINE
- - - NEW UNDERGROUND LINE
- EXISTING ABOVE GROUND LINE
- NEW ABOVE GROUND LINE
- EXISTING BORE AND JACK
- NEW BORE AND JACK
- EXISTING BRIDGE ATTACHMENT
- NEW BRIDGE ATTACHMENT
- ▲ FW-INJ-XX INJECTION WELL
- ▲ UPGRAD-INJ-XX INJECTION WELL
- ▲ COMP-INJ-XX INJECTION WELL
- FR-EX-XX EXTRACTION WELL
- IRZ-XX WELL INJECTION/EXTRACTION VARIES
- PI POINT OF INTERSECTION
- AP ANGLE POINT (HORIZ)
- GB GRADE BREAK
- BOP BOTTOM OF PIPE

NOTE:
SEE PIPELINE KEY MAP AND PIPE
SCHEDULE ON DRAWINGS C-5 AND C-6,
FOR NUMBER AND SIZE OF PIPES.

PLAN



PIPELINE "B" PROFILE

DATUM: HORIZONTAL:		PROJECTION:		NOV 2011 PRELIMINARY PLANS-NOT FOR CONSTRUCTION		APPRD BY:		AUTHORIZATION:																					
VERTICAL:		UNITS:																											
REFERENCE DWGS:																													
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NO.	DATE	DESCRIPTION	APPRD. NO.	DATE	DESCRIPTION	APPRD. NO.	DATE	DESCRIPTION	APPRD.																				
REVISIONS																													
SCALES: 1 inch = 40' HORT. 10' VERT. 1 centimeter =																													

TOPOCK GROUNDWATER REMEDIATION PROJECT
PLAN AND PROFILE
PIPELINE "B" STA 45+50 TO STA 56+00
 PACIFIC GAS AND ELECTRIC COMPANY
 SAN FRANCISCO, CALIFORNIA

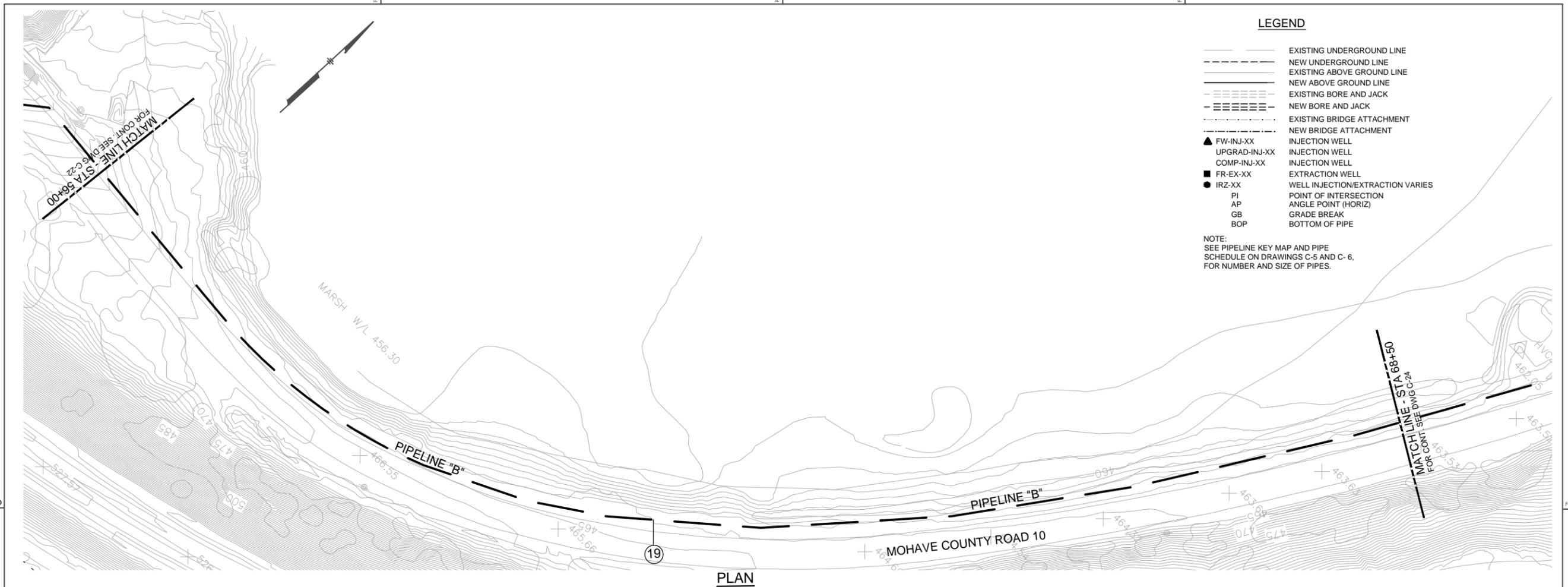


JCN	AREA	COUNTY	PROFILE
SHEET NO.	OF	DRAWING NUMBER	CHANGE
C-22			

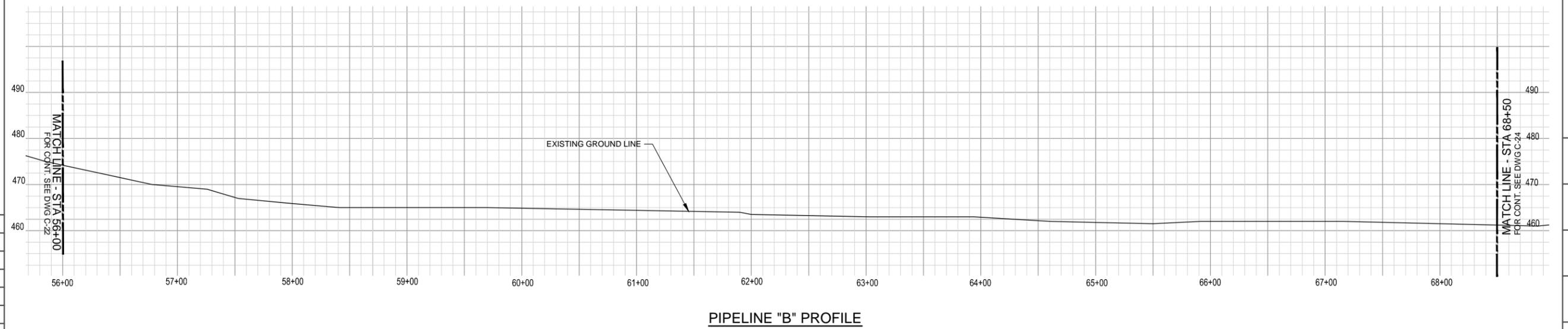
LEGEND

- EXISTING UNDERGROUND LINE
- - - NEW UNDERGROUND LINE
- EXISTING ABOVE GROUND LINE
- - - NEW ABOVE GROUND LINE
- - - EXISTING BORE AND JACK
- - - NEW BORE AND JACK
- - - EXISTING BRIDGE ATTACHMENT
- - - NEW BRIDGE ATTACHMENT
- ▲ FW-INJ-XX INJECTION WELL
- ▲ UPGRAD-INJ-XX INJECTION WELL
- ▲ COMP-INJ-XX INJECTION WELL
- FR-EX-XX EXTRACTION WELL
- IRZ-XX WELL INJECTION/EXTRACTION VARIES
- PI POINT OF INTERSECTION
- AP ANGLE POINT (HORIZ)
- GB GRADE BREAK
- BOP BOTTOM OF PIPE

NOTE:
SEE PIPELINE KEY MAP AND PIPE
SCHEDULE ON DRAWINGS C-5 AND C-6,
FOR NUMBER AND SIZE OF PIPES.



PLAN



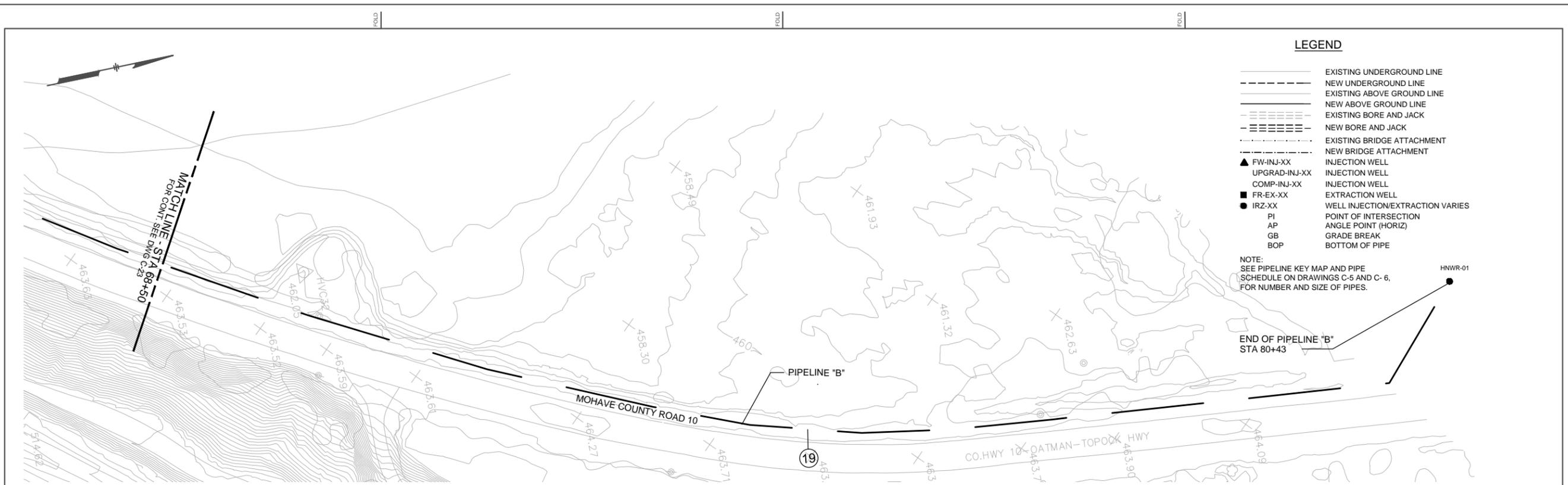
PIPELINE "B" PROFILE

DATUM: HORIZONTAL: PROJECTION:		NOV 2011 PRELIMINARY PLANS-NOT FOR CONSTRUCTION		APPRD BY:		AUTHORIZATION:		TOPOCK GROUNDWATER REMEDIATION PROJECT PLAN AND PROFILE PIPELINE "B" STA 56+00 TO STA 68+50 PACIFIC GAS AND ELECTRIC COMPANY SAN FRANCISCO, CALIFORNIA		JCIN: _____ AREA: _____ COUNTY: _____ PROFILE: _____	
VERTICAL: UNITS:										SHEET NO. _____ OF _____ DRAWING NUMBER C-23	
REFERENCE DWGS:		NO. DATE DESCRIPTION APPR. NO. DATE		NO. DATE DESCRIPTION APPR. NO. DATE		NO. DATE DESCRIPTION APPR. NO. DATE				INCHES	
SCALES: 1 inch = 40' HORT. 10' VERT. 1 centimeter =		REVISIONS								FEET	

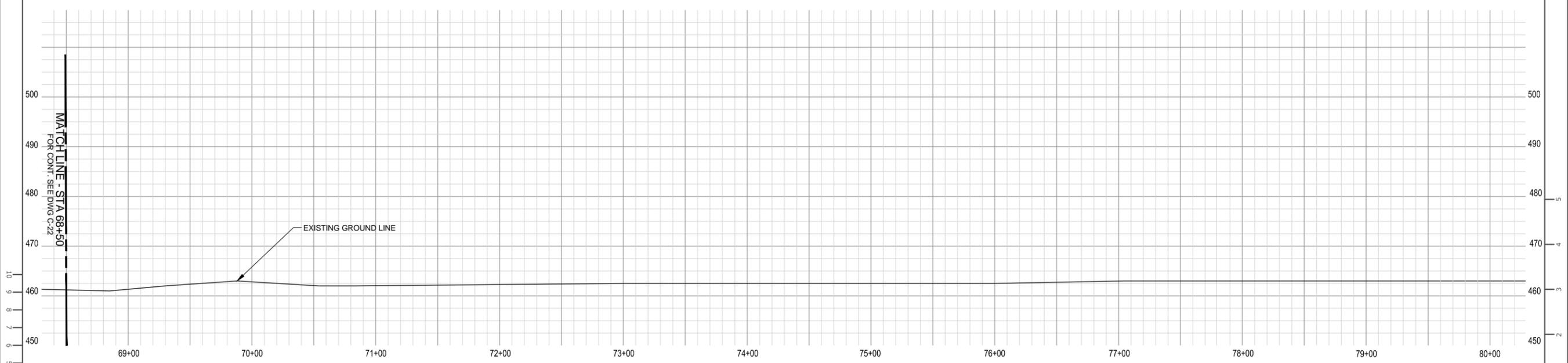
LEGEND

- EXISTING UNDERGROUND LINE
- - - NEW UNDERGROUND LINE
- EXISTING ABOVE GROUND LINE
- NEW ABOVE GROUND LINE
- - - EXISTING BORE AND JACK
- - - NEW BORE AND JACK
- - - EXISTING BRIDGE ATTACHMENT
- - - NEW BRIDGE ATTACHMENT
- ▲ FW-INJ-XX INJECTION WELL
- ▲ UPGRAD-INJ-XX INJECTION WELL
- ▲ COMP-INJ-XX INJECTION WELL
- FR-EX-XX EXTRACTION WELL
- IRZ-XX WELL INJECTION/EXTRACTION VARIES
- PI POINT OF INTERSECTION
- AP ANGLE POINT (HORIZ)
- GB GRADE BREAK
- BOP BOTTOM OF PIPE

NOTE:
SEE PIPELINE KEY MAP AND PIPE
SCHEDULE ON DRAWINGS C-5 AND C- 6,
FOR NUMBER AND SIZE OF PIPES.



PLAN



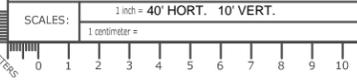
PIPELINE "B" PROFILE

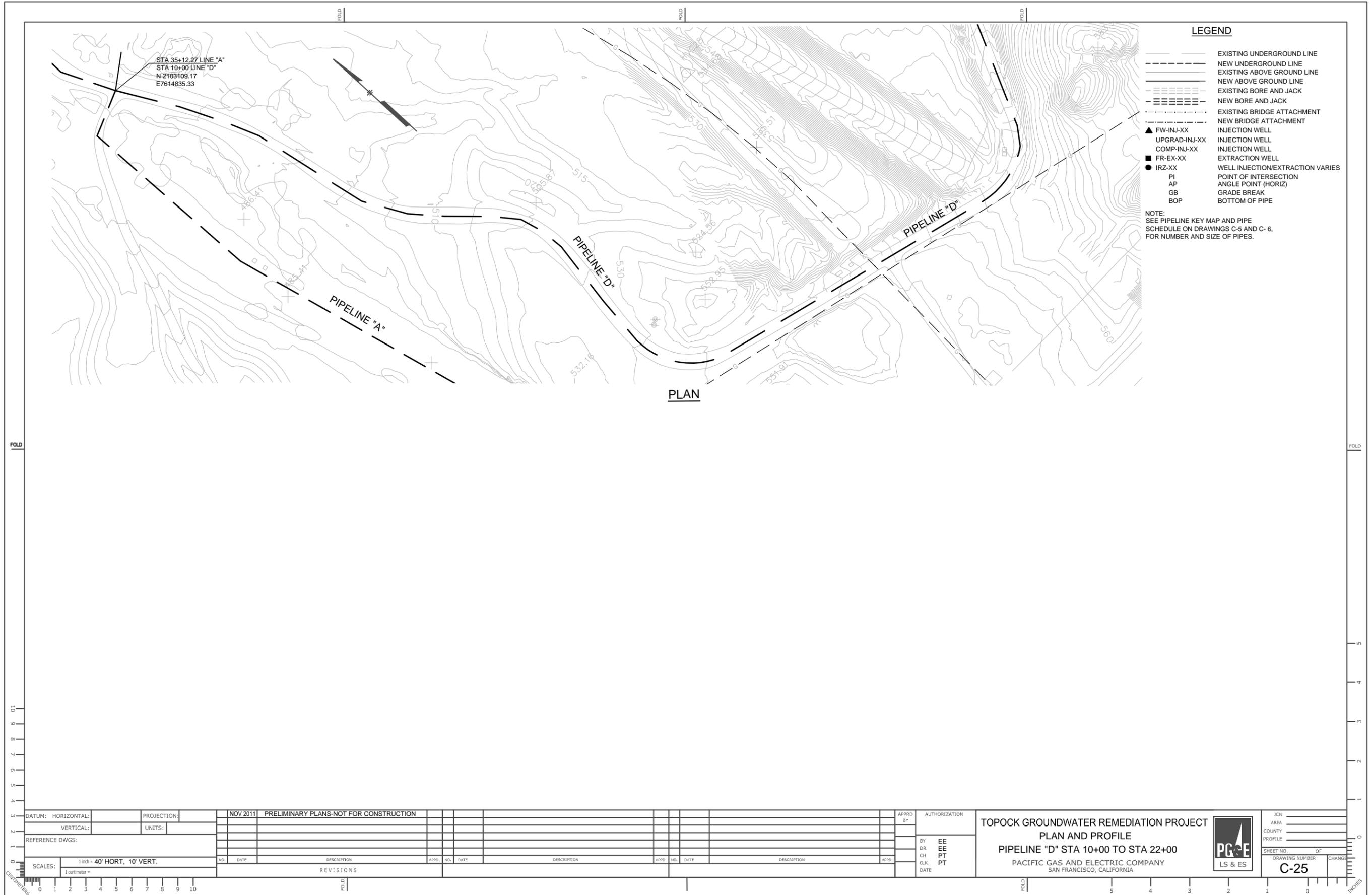
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REFERENCE DWGS:					DR: EE	
					CH: PT	
					D.K.: PT	
					DATE:	

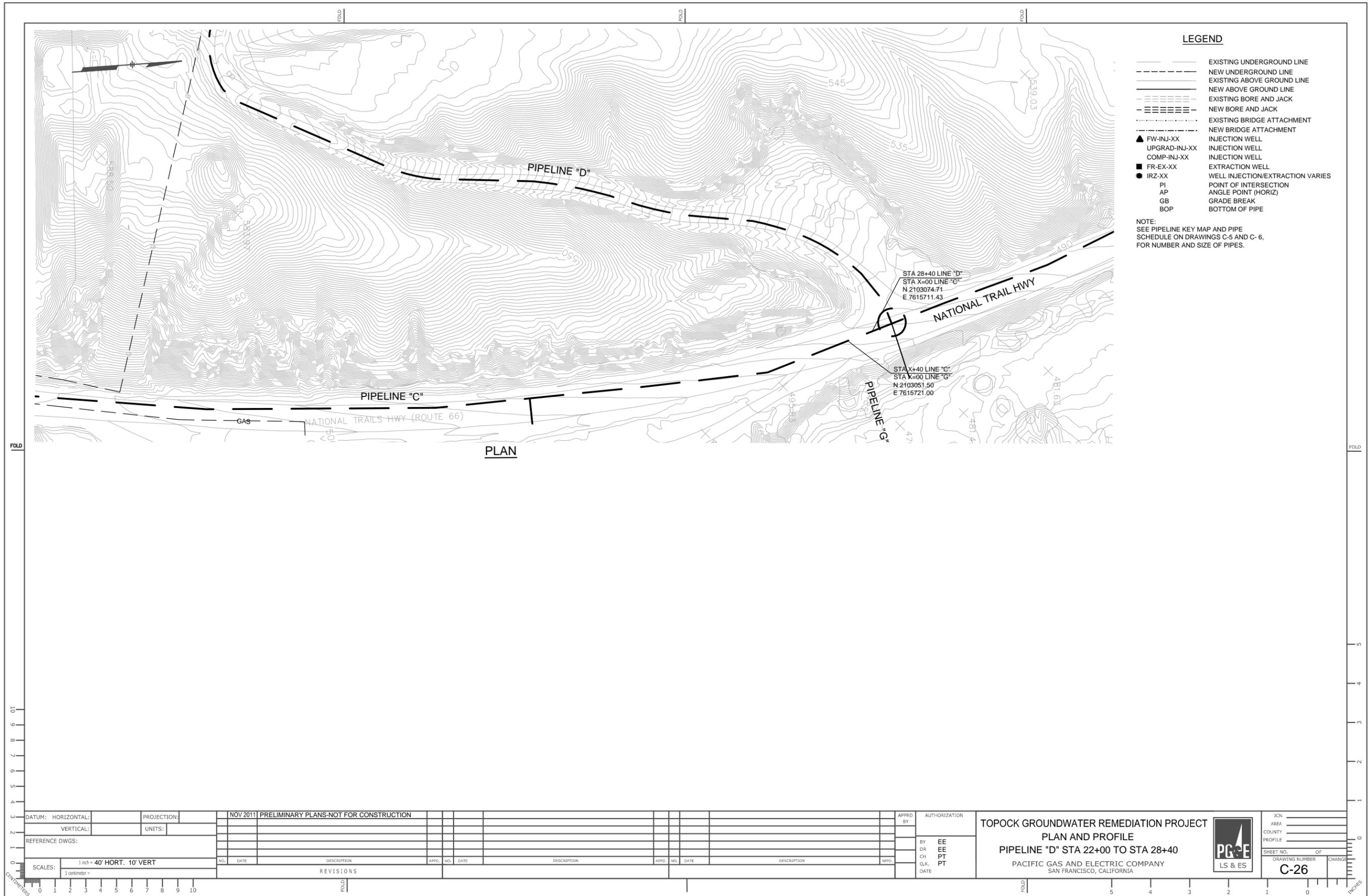
TOPOCK GROUNDWATER REMEDIATION PROJECT
PLAN AND PROFILE
PIPELINE "B" STA 68+50 TO STA 80+43
 PACIFIC GAS AND ELECTRIC COMPANY
 SAN FRANCISCO, CALIFORNIA



JCN	AREA	COUNTY	PROFILE
SHEET NO.	OF	DRAWING NUMBER	CHANGE
		C-24	







LEGEND

- EXISTING UNDERGROUND LINE
- - - NEW UNDERGROUND LINE
- EXISTING ABOVE GROUND LINE
- NEW ABOVE GROUND LINE
- - - EXISTING BORE AND JACK
- - - NEW BORE AND JACK
- - - EXISTING BRIDGE ATTACHMENT
- - - NEW BRIDGE ATTACHMENT
- ▲ FW-INJ-XX INJECTION WELL
- ▲ UPGRAD-INJ-XX INJECTION WELL
- ▲ COMP-INJ-XX INJECTION WELL
- FR-EX-XX EXTRACTION WELL
- IRZ-XX WELL INJECTION/EXTRACTION VARIES
- PI POINT OF INTERSECTION
- AP ANGLE POINT (HORIZ)
- GB GRADE BREAK
- BOP BOTTOM OF PIPE

NOTE:
SEE PIPELINE KEY MAP AND PIPE
SCHEDULE ON DRAWINGS C-5 AND C- 6,
FOR NUMBER AND SIZE OF PIPES.

STA 28+40 LINE "D"
STA X+00 LINE "C"
N 2103074.71
E 7615711.43

STA X+40 LINE "C"
STA X+00 LINE "G"
N 2103051.50
E 7615721.00

PLAN

DATUM:	HORIZONTAL:	PROJECTION:	NOV 2011	PRELIMINARY PLANS-NOT FOR CONSTRUCTION	APPRD BY:	AUTHORIZATION:
VERTICAL:	UNITS:				BY: EE	
REFERENCE DWGS:					DR: EE	
					CH: PT	
					D.K.: PT	
					DATE:	

TOPOCK GROUNDWATER REMEDIATION PROJECT
PLAN AND PROFILE
PIPELINE "D" STA 22+00 TO STA 28+40
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA



JCN:	AREA:	COUNTY:	PROFILE:
SHEET NO.:	OF:	DRAWING NUMBER:	CHANGE:
C-26			

SCALES: 1 inch = 40' HORT. 10' VERT
1 centimeter =

REVISIONS

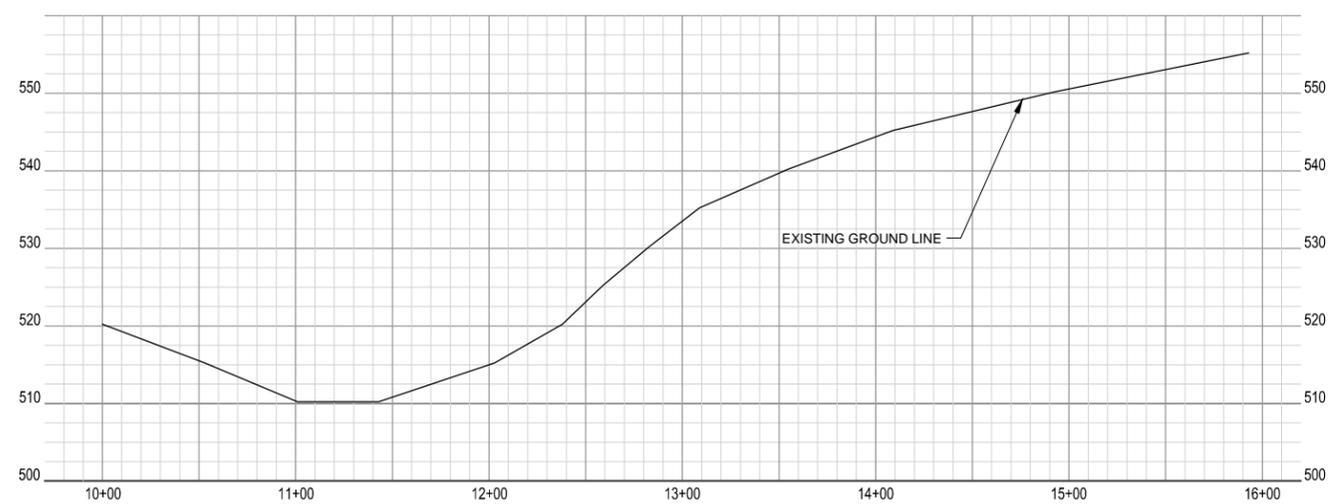


LEGEND

- EXISTING UNDERGROUND LINE
- - - NEW UNDERGROUND LINE
- EXISTING ABOVE GROUND LINE
- NEW ABOVE GROUND LINE
- - - EXISTING BORE AND JACK
- - - NEW BORE AND JACK
- - - EXISTING BRIDGE ATTACHMENT
- - - NEW BRIDGE ATTACHMENT
- ▲ FW-INJ-XX INJECTION WELL
- ▲ UPGRAD-INJ-XX INJECTION WELL
- ▲ COMP-INJ-XX INJECTION WELL
- FR-EX-XX EXTRACTION WELL
- IRZ-XX WELL INJECTION/EXTRACTION VARIES
- PI POINT OF INTERSECTION
- AP ANGLE POINT (HORIZ)
- GB GRADE BREAK
- BOP BOTTOM OF PIPE

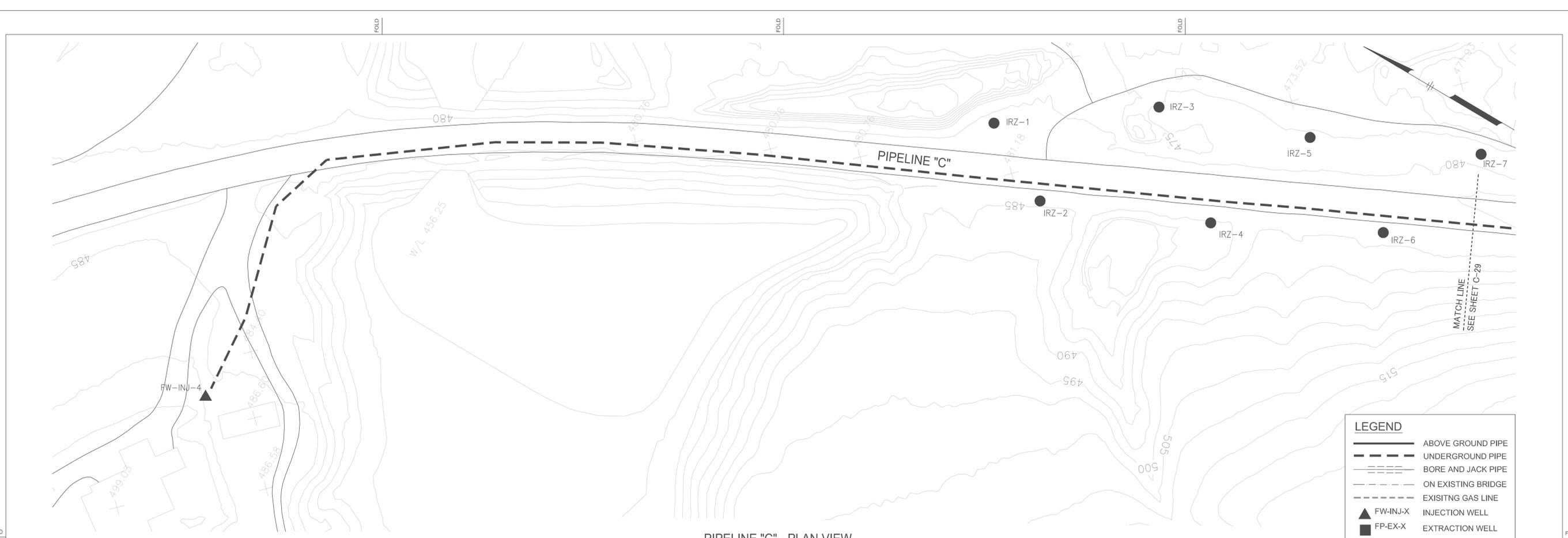
NOTE:
SEE PIPELINE KEY MAP AND PIPE SCHEDULE ON DRAWINGS C-5 AND C-6, FOR NUMBER AND SIZE OF PIPES.

PLAN



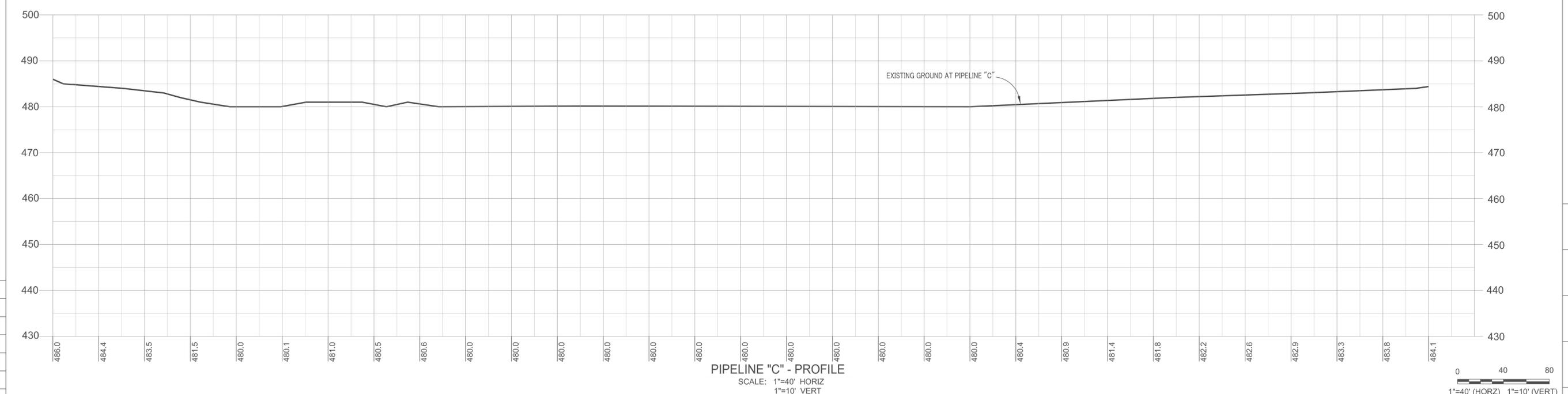
PIPELINE "J"- PROFILE

DATUM: HORIZONTAL:		PROJECTION:		NOV 2011 PRELIMINARY PLANS-NOT FOR CONSTRUCTION		APPROD BY:		AUTHORIZATION:		TOPOCK GROUNDWATER REMEDIATION PROJECT PLAN AND PROFILE PIPELINE "J" STA 10+00 TO STA 15+83 PACIFIC GAS AND ELECTRIC COMPANY SAN FRANCISCO, CALIFORNIA				JCN _____ AREA _____ COUNTY _____ PROFILE _____ SHEET NO. _____ OF _____ DRAWING NUMBER C-27 CHANGE _____	
VERTICAL:		UNITS:													
REFERENCE DWGS:				NO. DATE DESCRIPTION				APPROD. NO. DATE DESCRIPTION							
SCALES: 1 inch = 40' HORT. 10' VERT				REVISIONS											

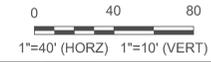


PIPELINE "C" - PLAN VIEW
SCALE: 1"=40'

LEGEND	
	ABOVE GROUND PIPE
	UNDERGROUND PIPE
	BORE AND JACK PIPE
	ON EXISTING BRIDGE
	EXISTING GAS LINE
	INJECTION WELL
	EXTRACTION WELL
	WELL INJ/EXT VARIES



PIPELINE "C" - PROFILE
SCALE: 1"=40' HORIZ
1"=10' VERT



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DATUM:	HORIZONTAL: 40'	PROJECTION:	
	VERTICAL: 10'	UNITS:	
REFERENCE DWGS:			
SCALES:	1 inch = 40'		
	1 centimeter =		

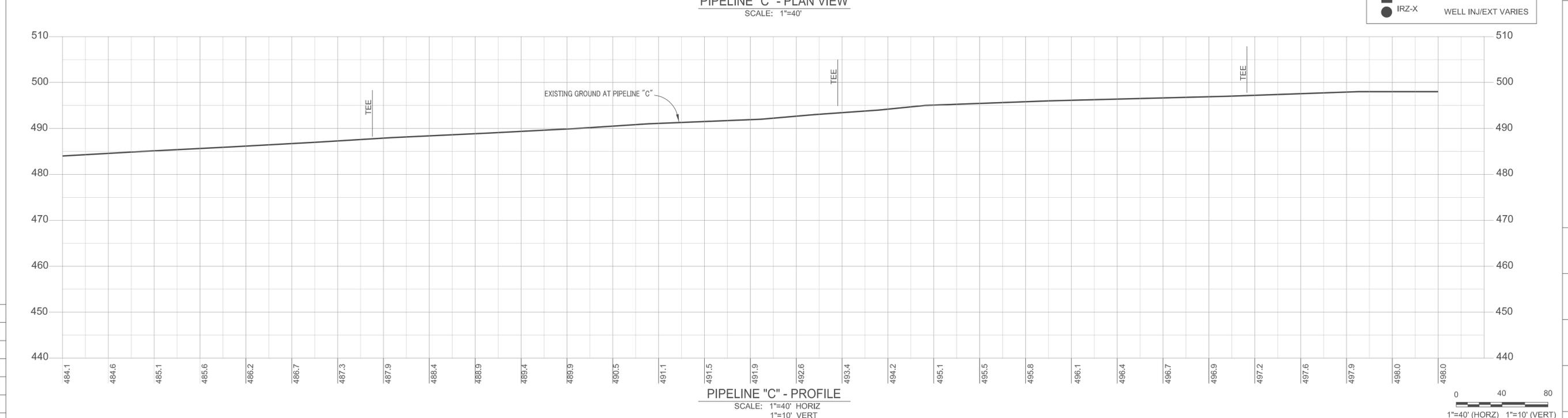
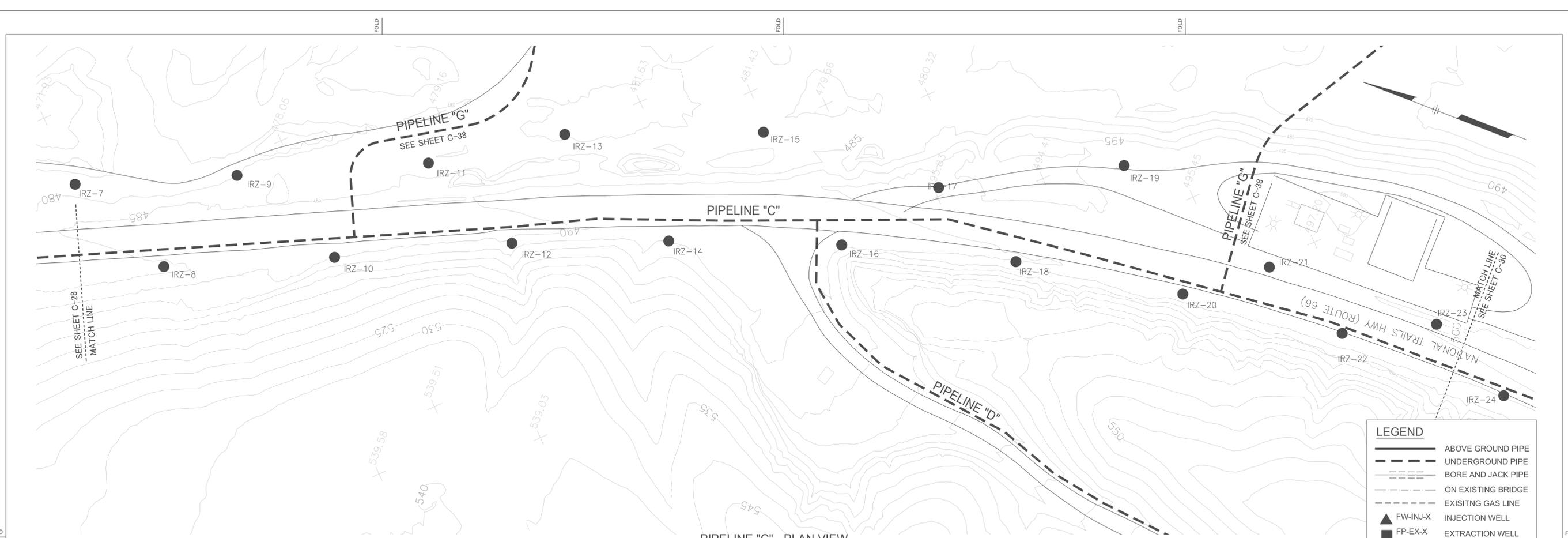
REVISIONS		APPD. NO. DATE		DESCRIPTION	
1	11/14/11				30% SUBMITTAL

APPRD BY	AUTHORIZATION
BY: PES	
DR: MAR	
CH:	
O.K. DATE	

TOPOCK GROUNDWATER REMEDIATION PROJECT
PLAN AND PROFILE
 PIPELINE "C" - STA 10+00 TO STA XX+XX
 PACIFIC GAS AND ELECTRIC COMPANY
 SAN FRANCISCO, CALIFORNIA

JCN _____
 AREA _____
 COUNTY _____
 PROFILE _____

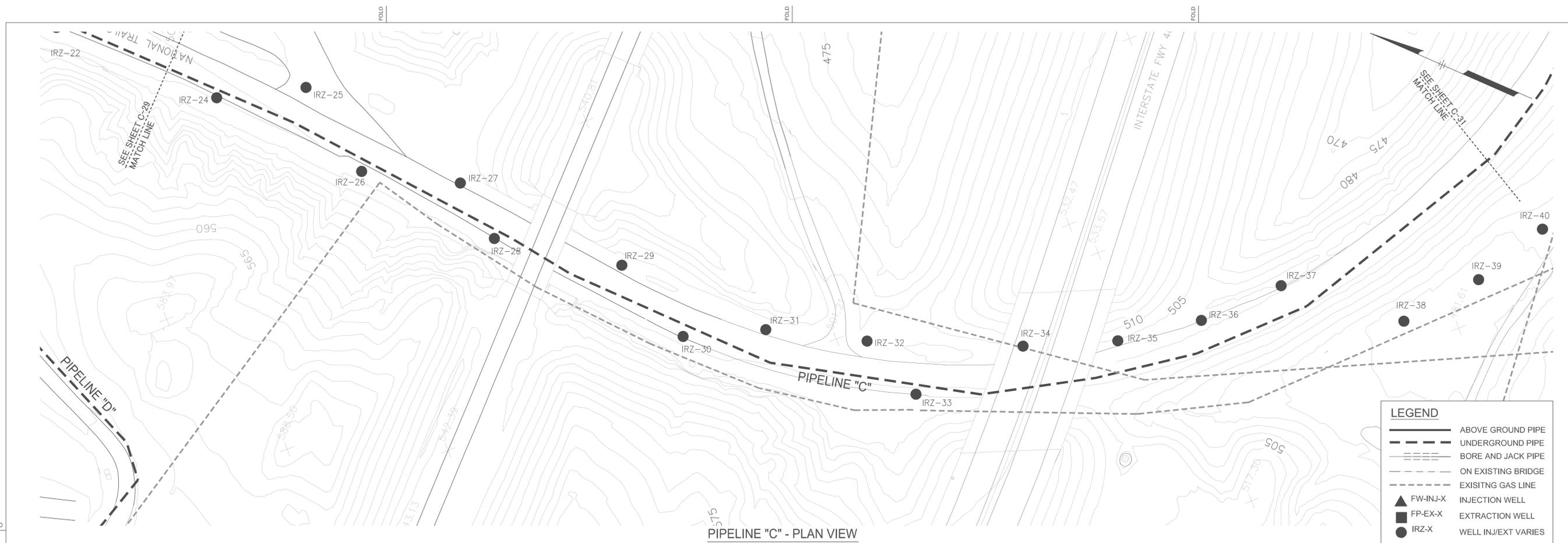
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 DRAWING NUMBER _____
C-28



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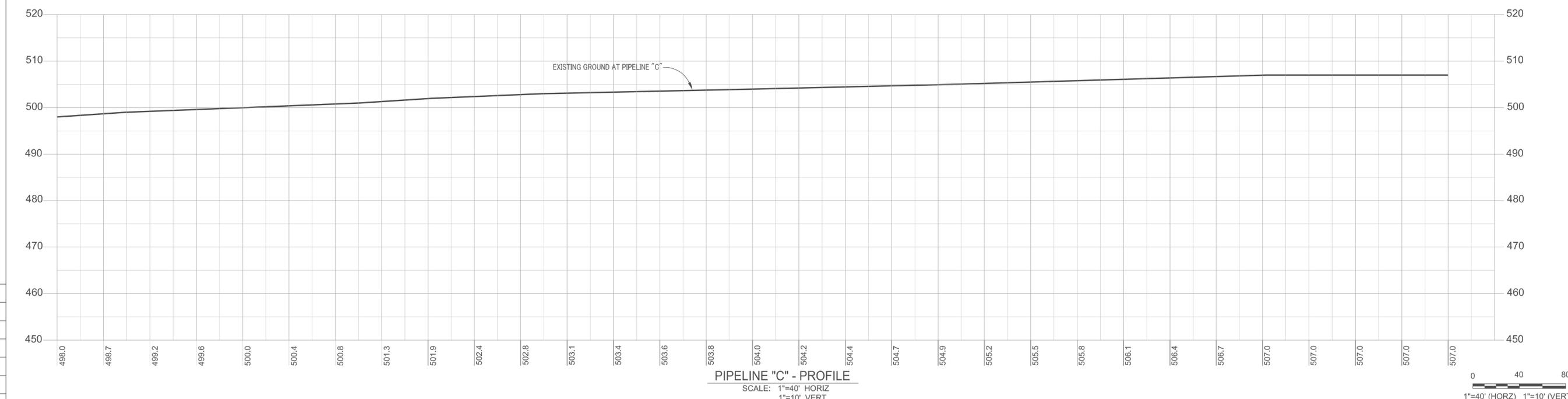
DATUM: HORIZONTAL: 40' VERTICAL: 10' REFERENCE DWGS:	PROJECTION: UNITS:	NO. 1 DATE 11/14/11 DESCRIPTION 30% SUBMITTAL	APPD. NO. DATE DESCRIPTION APPD. NO. DATE DESCRIPTION	APPD. NO. DATE DESCRIPTION APPD. NO. DATE DESCRIPTION	APPD. NO. DATE DESCRIPTION APPD. NO. DATE DESCRIPTION	APPROV. BY: PES AUTHORIZATION: MAR BY: DR CH: O.K. DATE:	TOPOCK GROUNDWATER REMEDIATION PROJECT PLAN AND PROFILE PIPELINE "C" - STA XX+XX TO STA XX+XX PACIFIC GAS AND ELECTRIC COMPANY SAN FRANCISCO, CALIFORNIA	JCN: _____ AREA: _____ COUNTY: _____ PROFILE: _____ SHEET NO. _____ OF _____ DRAWING NUMBER C-29
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SCALES: 1 inch = 40'
 1 centimeter = _____



LEGEND	
	ABOVE GROUND PIPE
	UNDERGROUND PIPE
	BORE AND JACK PIPE
	ON EXISTING BRIDGE
	EXISTING GAS LINE
	FW-INJ-X INJECTION WELL
	FP-EX-X EXTRACTION WELL
	IRZ-X WELL INJ/EXT VARIES

PIPELINE "C" - PLAN VIEW
SCALE: 1"=40'



PIPELINE "C" - PROFILE
SCALE: 1"=40' HORIZ
1"=10' VERT



DATUM:	HORIZONTAL: 40'	PROJECTION:	
	VERTICAL: 10'	UNITS:	
REFERENCE DWGS:			
SCALES:	1 inch = 40'		
	1 centimeter =		

REVISIONS		APPD.		NO.		DATE		DESCRIPTION	
1	11/14/11								30% SUBMITTAL

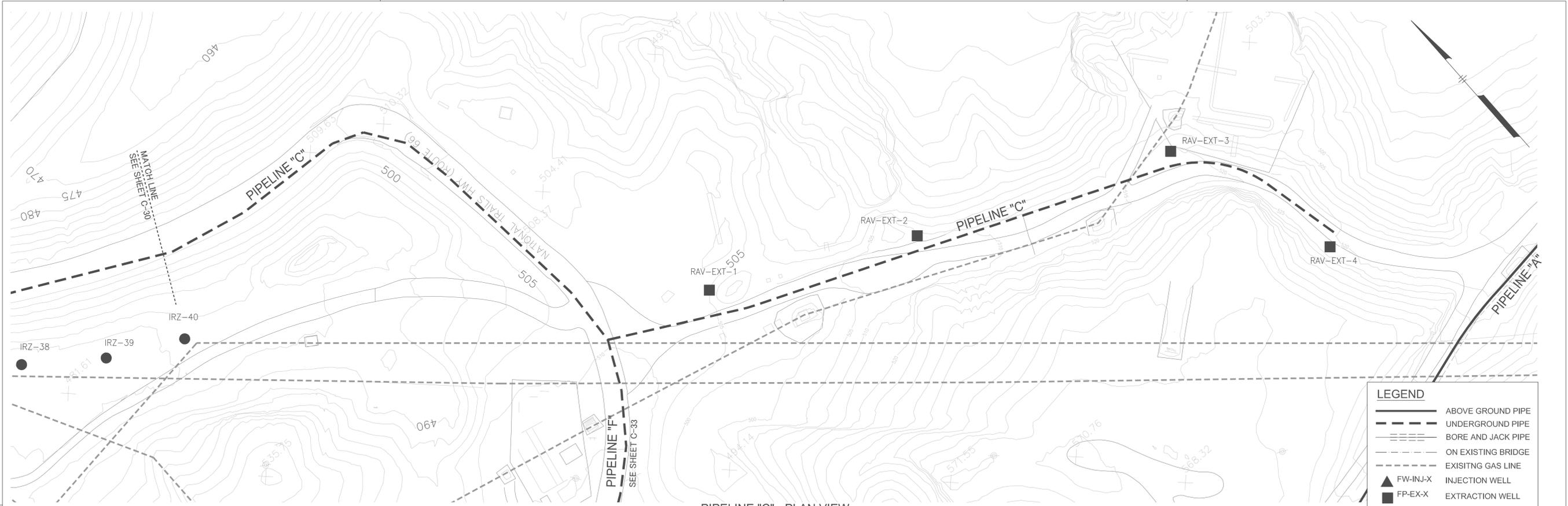
APPRD BY	AUTHORIZATION
BY: PES	
DR: MAR	
CH:	
O.K. DATE	

TOPOCK GROUNDWATER REMEDIATION PROJECT
 PLAN AND PROFILE
 PIPELINE "C" - STA XX+XX TO STA XX+XX
 PACIFIC GAS AND ELECTRIC COMPANY
 SAN FRANCISCO, CALIFORNIA

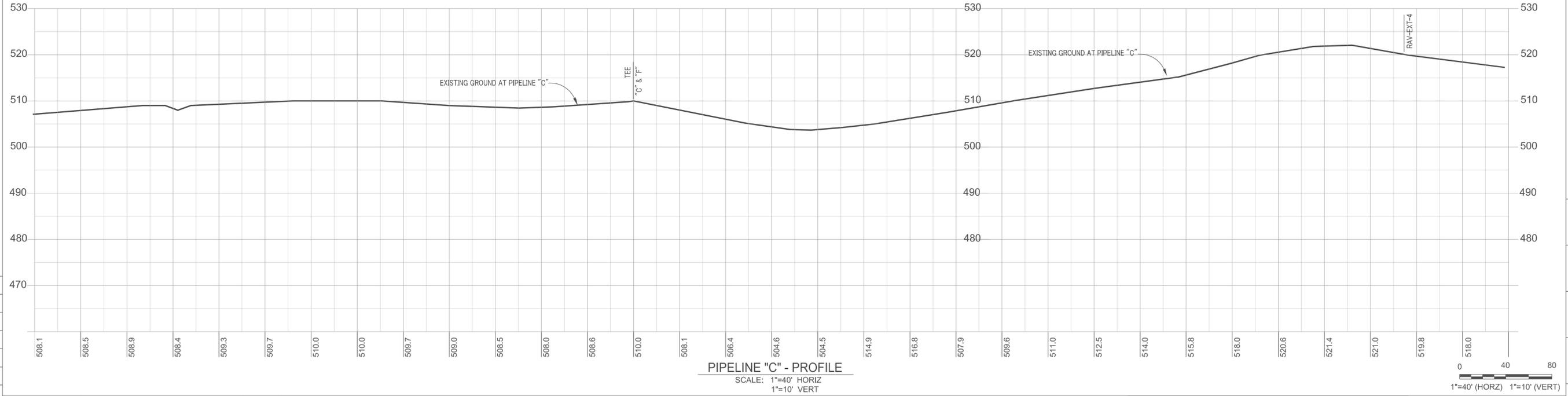
JCN
 AREA
 COUNTY
 PROFILE

SHEET NO. OF
 DRAWING NUMBER CHANGE
C-30

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PIPELINE "C" - PLAN VIEW
SCALE: 1"=40'



PIPELINE "C" - PROFILE
SCALE: 1"=40' HORIZ
1"=10' VERT

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DATUM:	HORIZONTAL: 40'	PROJECTION:	
	VERTICAL: 10'	UNITS:	
REFERENCE DWGS:			
SCALES:	1 inch = 40'		
	1 centimeter =		

NO.	DATE	DESCRIPTION	APPD.	NO.	DATE	DESCRIPTION	APPD.	NO.	DATE	DESCRIPTION
1	11/14/11	30% SUBMITTAL								

APPRD BY	AUTHORIZATION
BY: PES	
DR: MAR	
CH:	
O.K. DATE:	

TOPOCK GROUNDWATER REMEDIATION PROJECT
PLAN AND PROFILE
 PIPELINE "C" - STA XX+XX TO STA XX+XX
 PACIFIC GAS AND ELECTRIC COMPANY
 SAN FRANCISCO, CALIFORNIA

JCN
 AREA
 COUNTY
 PROFILE

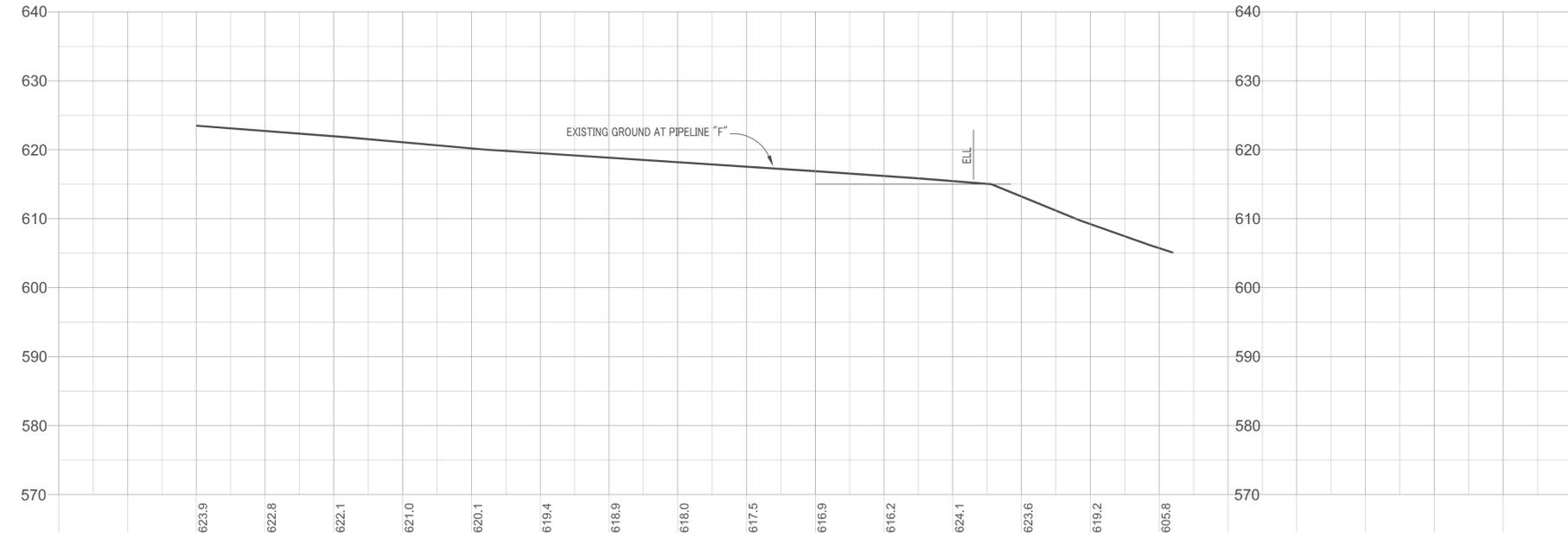
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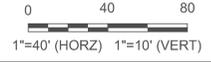
PIPELINE "F" - PLAN VIEW
SCALE: 1"=40'

LEGEND

- ABOVE GROUND PIPE
- - - UNDERGROUND PIPE
- ≡≡≡ BORE AND JACK PIPE
- · - · - ON EXISTING BRIDGE
- · - · - EXISTING GAS LINE
- ▲ FW-INJ-X INJECTION WELL
- FP-EX-X EXTRACTION WELL
- IRZ-X WELL INJ/EXT VARIES



PIPELINE "F" - PROFILE
SCALE: 1"=40' HORIZ
1"=10' VERT



DATUM:	HORIZONTAL: 40'	PROJECTION:	
	VERTICAL: 10'	UNITS:	
REFERENCE DWGS:			
SCALES:	1 inch = 40'		
	1 centimeter =		

NO.	DATE	DESCRIPTION	APPD.	NO.	DATE	DESCRIPTION	APPD.	NO.	DATE	DESCRIPTION
1	11/14/11	30% SUBMITTAL								
REVISIONS										

APPRD BY	AUTHORIZATION
BY: PES	
DR: MAR	
CH:	
O.K. DATE	

TOPOCK GROUNDWATER REMEDIATION PROJECT
 PLAN AND PROFILE
 PIPELINE "F" - STA XX+XX TO STA XX+XX
 PACIFIC GAS AND ELECTRIC COMPANY
 SAN FRANCISCO, CALIFORNIA

JCN _____
 AREA _____
 COUNTY _____
 PROFILE _____

SHEET NO. _____ OF _____
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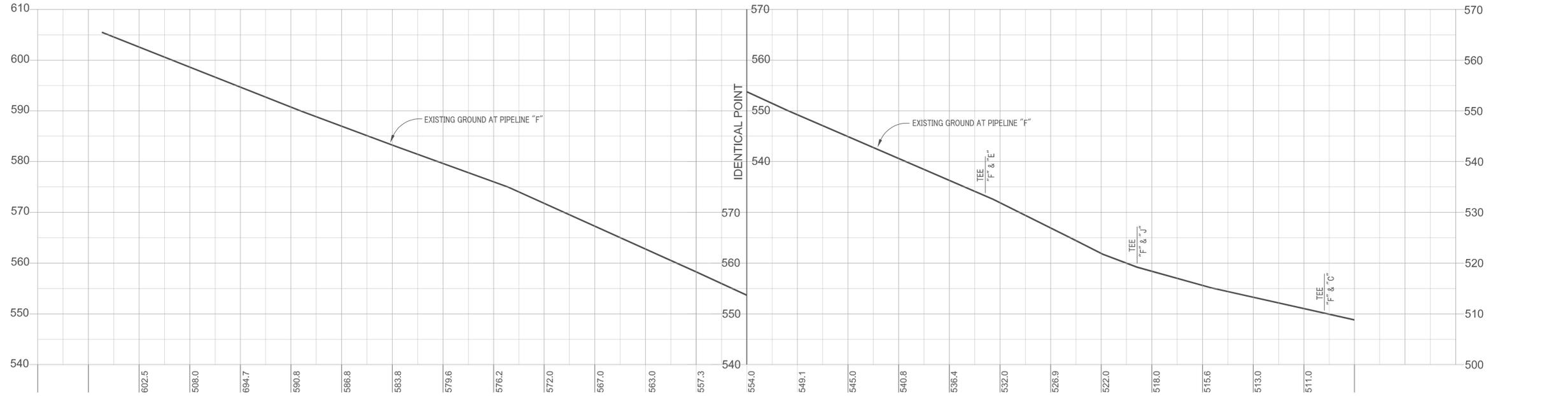
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PIPELINE "F" - PLAN VIEW
SCALE: 1"=40'

LEGEND

- ABOVE GROUND PIPE
- - - UNDERGROUND PIPE
- ≡≡≡ BORE AND JACK PIPE
- · - · - ON EXISTING BRIDGE
- · - · - EXISTING GAS LINE
- ▲ FW-INJ-X INJECTION WELL
- FP-EX-X EXTRACTION WELL
- IRZ-X WELL INJ/EXT VARIES



PIPELINE "F" - PROFILE
SCALE: 1"=40' HORIZ
1"=10' VERT

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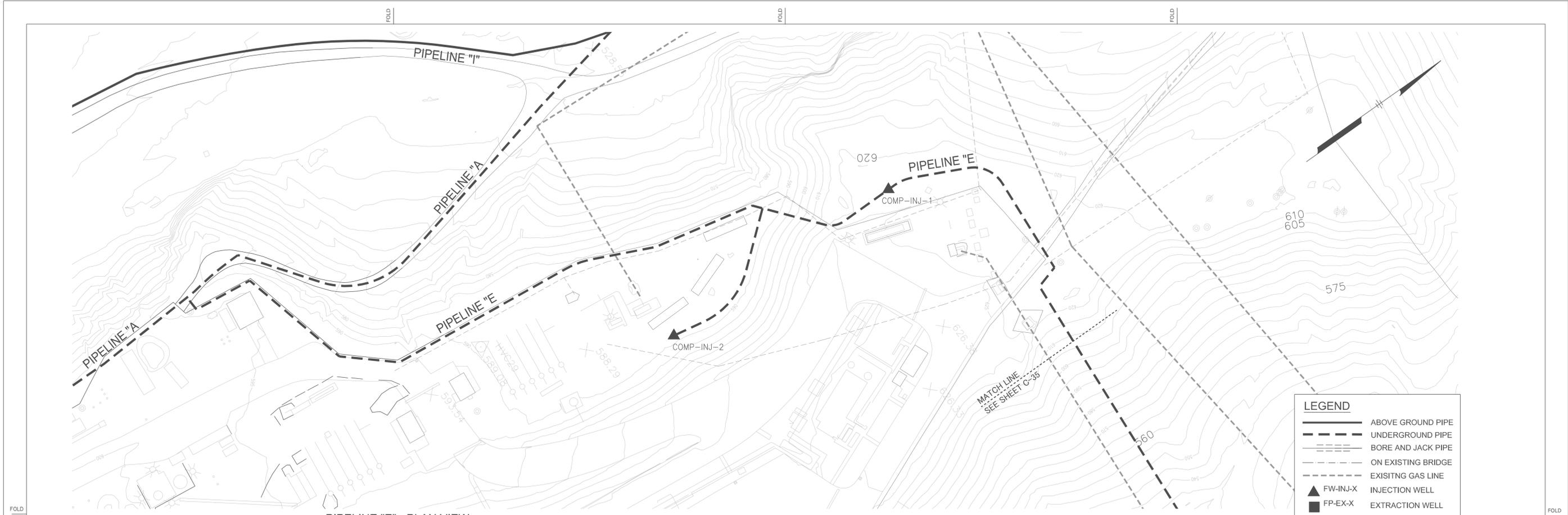
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SCALES:	1 inch = 40'		
	1 centimeter =		

NO.	DATE	DESCRIPTION	APPD.	NO.	DATE	DESCRIPTION	APPD.	NO.	DATE	DESCRIPTION
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APPRD BY	AUTHORIZATION
BY: PES	
DR: MAR	
CH:	
O.K. DATE	

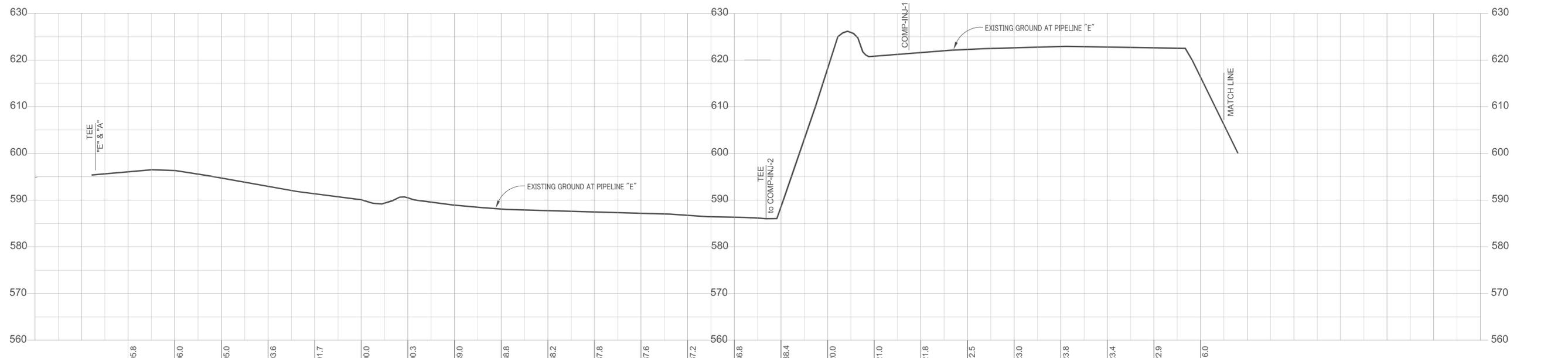
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PLAN AND PROFILE
 PIPELINE "F" - STA XX+XX TO STA XX+XX
 PACIFIC GAS AND ELECTRIC COMPANY
 SAN FRANCISCO, CALIFORNIA

SHEET NO. OF
 DRAWING NUMBER OF CHANGE
C-33



PIPELINE "E" - PLAN VIEW
SCALE: 1"=40'

LEGEND	
	ABOVE GROUND PIPE
	UNDERGROUND PIPE
	BORE AND JACK PIPE
	ON EXISTING BRIDGE
	EXISTING GAS LINE
	FW-INJ-X INJECTION WELL
	FP-EX-X EXTRACTION WELL
	IRZ-X WELL INJ/EXT VARIES



PIPELINE "E" - PROFILE
SCALE: 1"=40' HORIZ
1"=10' VERT

PIPELINE "E" - PROFILE
SCALE: 1"=40' HORIZ
1"=10' VERT



DATUM:	HORIZONTAL: 40'	PROJECTION:	
	VERTICAL: 10'	UNITS:	
REFERENCE DWGS:			
SCALES:	1 inch = 40'		
	1 centimeter =		

NO.	DATE	DESCRIPTION	APPD.	NO.	DATE	DESCRIPTION	APPD.	NO.	DATE	DESCRIPTION
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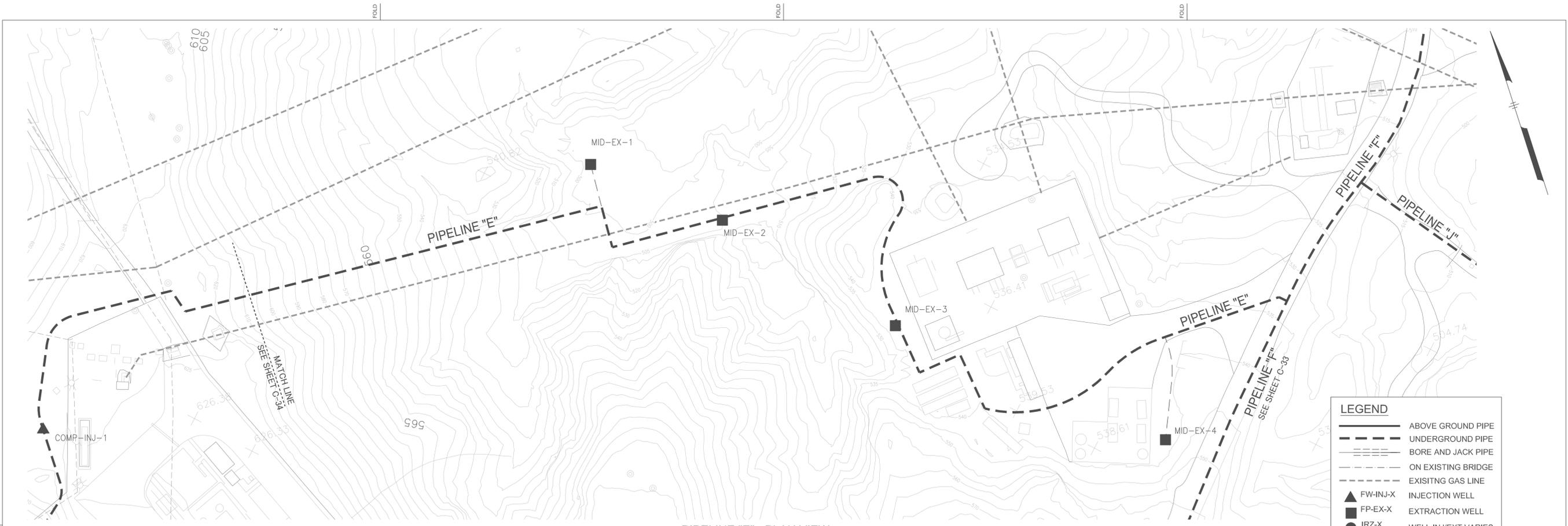
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BY: PES	
DR: MAR	
CH:	
O.K. DATE	

TOPOCK GROUNDWATER REMEDIATION PROJECT
 PLAN AND PROFILE
 PIPELINE "E" - STA XX+XX TO STA XX+XX
 PACIFIC GAS AND ELECTRIC COMPANY
 SAN FRANCISCO, CALIFORNIA

JCN _____
 AREA _____
 COUNTY _____
 PROFILE _____

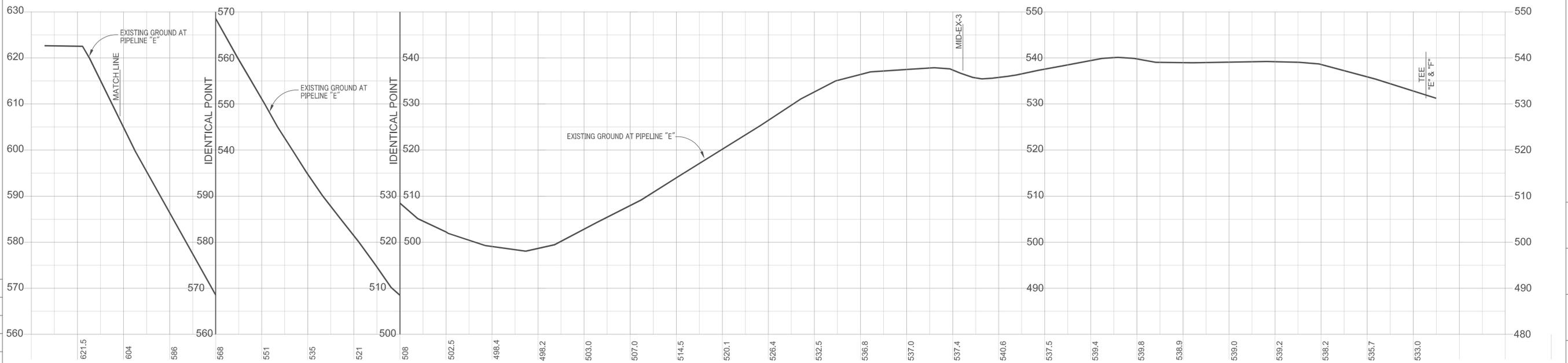
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PIPELINE "E" - PLAN VIEW
SCALE: 1"=40'

LEGEND	
	ABOVE GROUND PIPE
	UNDERGROUND PIPE
	BORE AND JACK PIPE
	ON EXISTING BRIDGE
	EXISTING GAS LINE
	FW-INJ-X INJECTION WELL
	FP-EX-X EXTRACTION WELL
	IRZ-X WELL INJ/EXT VARIES



PIPELINE "E" - PROFILE
SCALE: 1"=40' HORIZ
1"=10' VERT



DATUM:	HORIZONTAL: 40'	PROJECTION:	
	VERTICAL: 10'	UNITS:	
REFERENCE DWGS:			
SCALES:	1 inch = 40'		
	1 centimeter =		

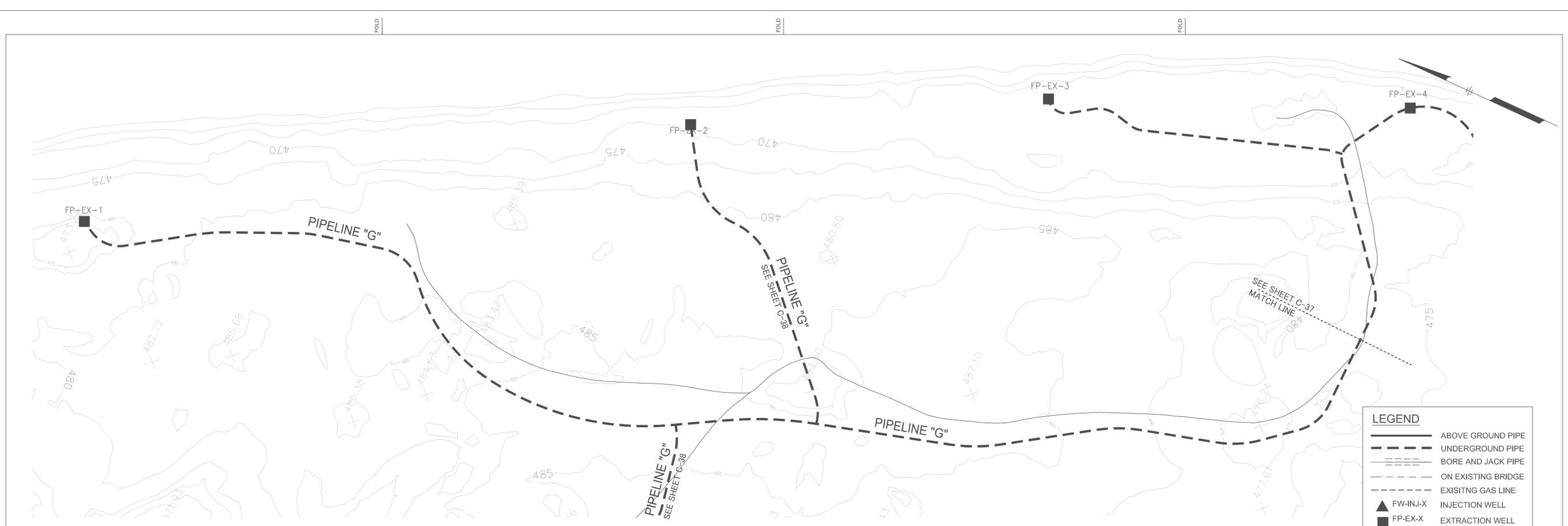
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NO.	DATE	DESCRIPTION	APPD. NO.
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APPRD BY	AUTHORIZATION
BY: PES	
DR: MAR	
CH:	
O.K. DATE	

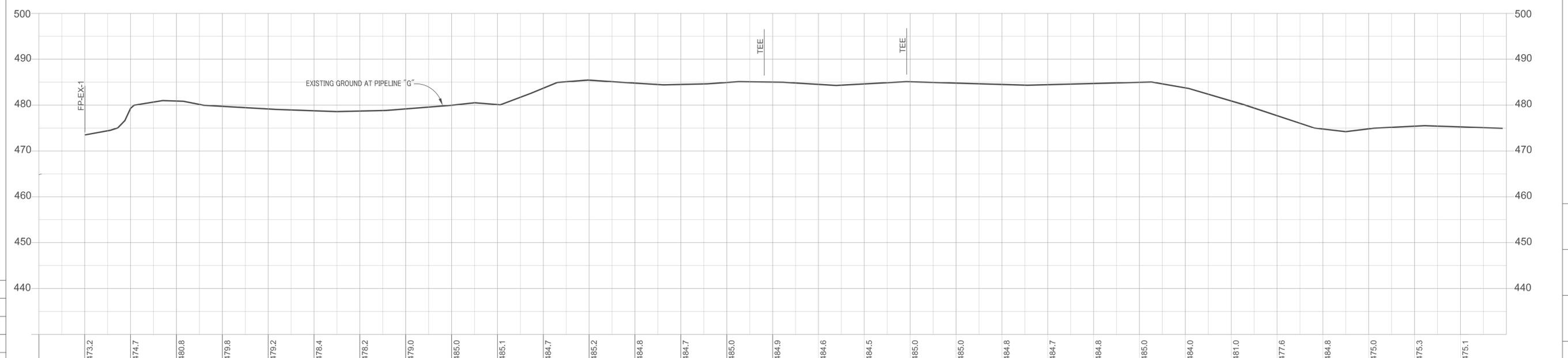
TOPOCK GROUNDWATER REMEDIATION PROJECT
PLAN AND PROFILE
PIPELINE "E" - STA XX+XX TO STA XX+XX
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

SHEET NO. OF
DRAWING NUMBER OF CHANGE
C-35

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PIPELINE "G" - PLAN VIEW
SCALE: 1"=40'



PIPELINE "G" - PROFILE
SCALE: 1"=40' HORIZ
1"=10' VERT

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DATUM:	HORIZONTAL: 40'	PROJECTION:	
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REFERENCE DWGS:			
SCALES:	1 inch = 40'		
	1 centimeter =		

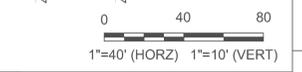
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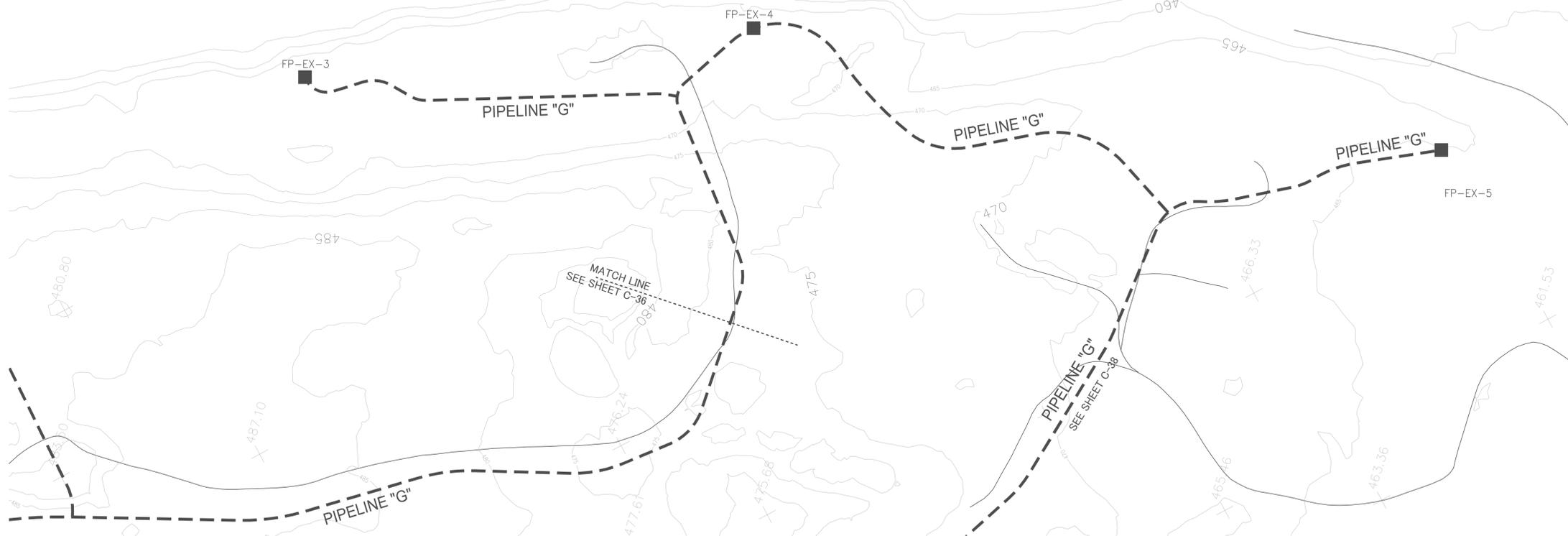
APPRD BY	AUTHORIZATION
BY PES	
DR MAR	
CH	
O.K.	
DATE	

TOPOCK GROUNDWATER REMEDIATION PROJECT
PLAN AND PROFILE
PIPELINE "G" - STA XX+XX TO STA XX+XX
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

JCN _____
AREA _____
COUNTY _____
PROFILE _____

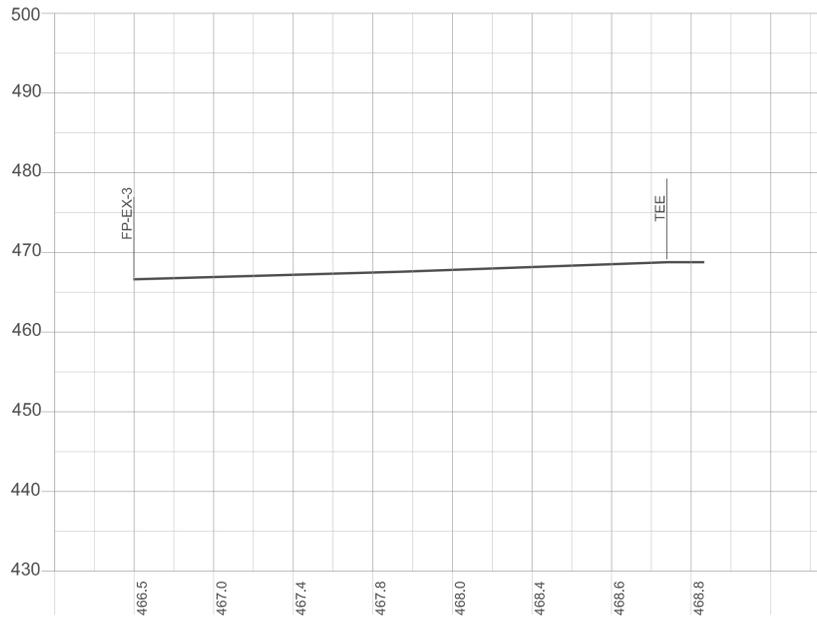
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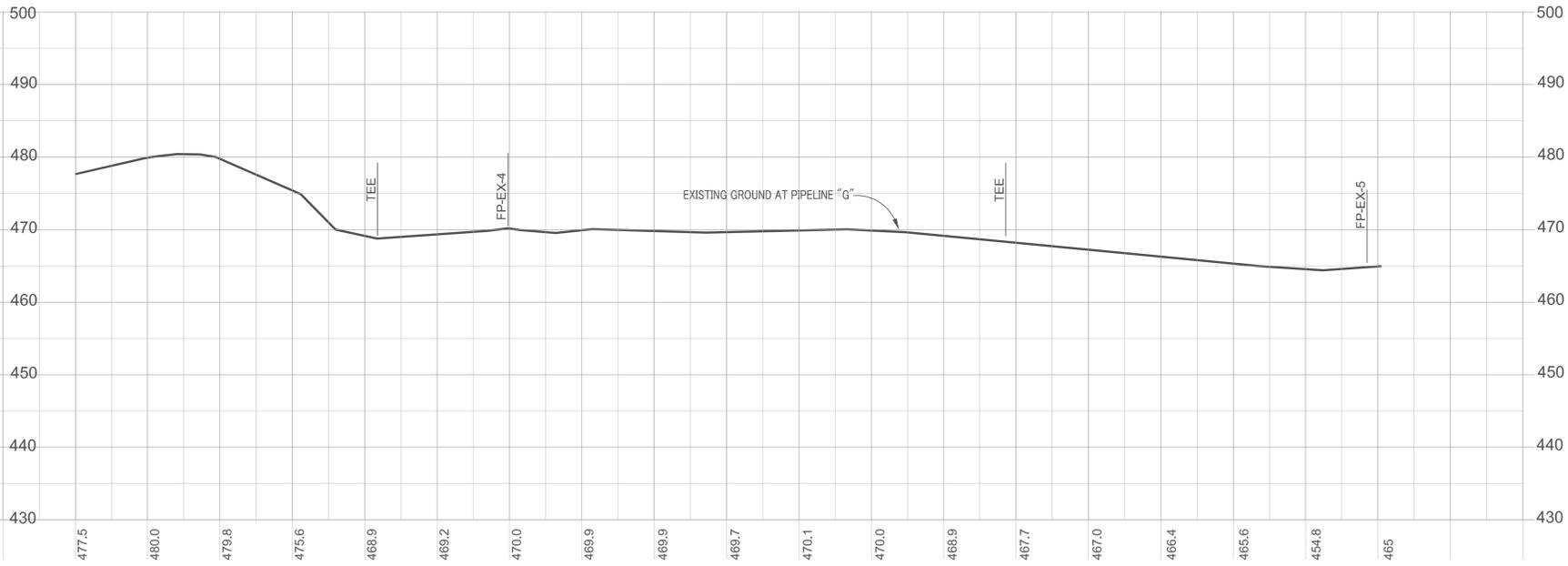


PIPELINE "G" - PLAN VIEW
SCALE: 1"=40'

LEGEND	
	ABOVE GROUND PIPE
	UNDERGROUND PIPE
	BORE AND JACK PIPE
	ON EXISTING BRIDGE
	EXISTING GAS LINE
	FW-INJ-X INJECTION WELL
	FP-EX-X EXTRACTION WELL
	IRZ-X WELL INJ/EXT VARIES



PIPELINE "G" - PROFILE
SCALE: 1"=40' HORIZ
1"=10' VERT



PIPELINE "G" - PROFILE
SCALE: 1"=40' HORIZ
1"=10' VERT



DATUM:	HORIZONTAL: 40'	PROJECTION:	
	VERTICAL: 10'	UNITS:	
REFERENCE DWGS:			
SCALES:	1 inch = 40'		
	1 centimeter =		

REVISIONS		APPD. NO. DATE		DESCRIPTION		APPD. NO. DATE		DESCRIPTION		APPD. NO. DATE		DESCRIPTION	
1	11/14/11												
													30% SUBMITTAL

APPRD BY	AUTHORIZATION
BY: PES	
DR: MAR	
CH:	
O.K. DATE	

TOPOCK GROUNDWATER REMEDIATION PROJECT
PLAN AND PROFILE
PIPELINE "G" - STA XX+XX TO STA XX+XX
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

JCN
AREA
COUNTY
PROFILE

SHEET NO. OF
DRAWING NUMBER CHANGE
C-37

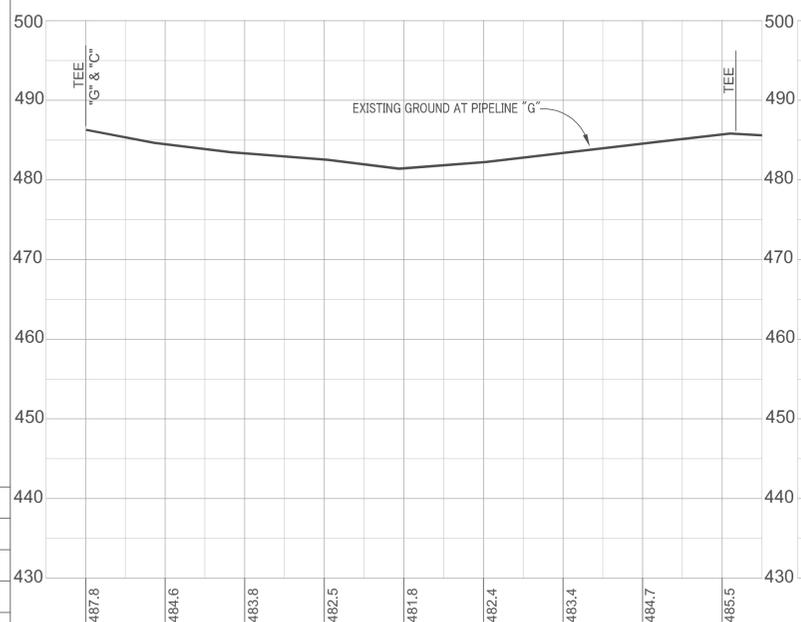
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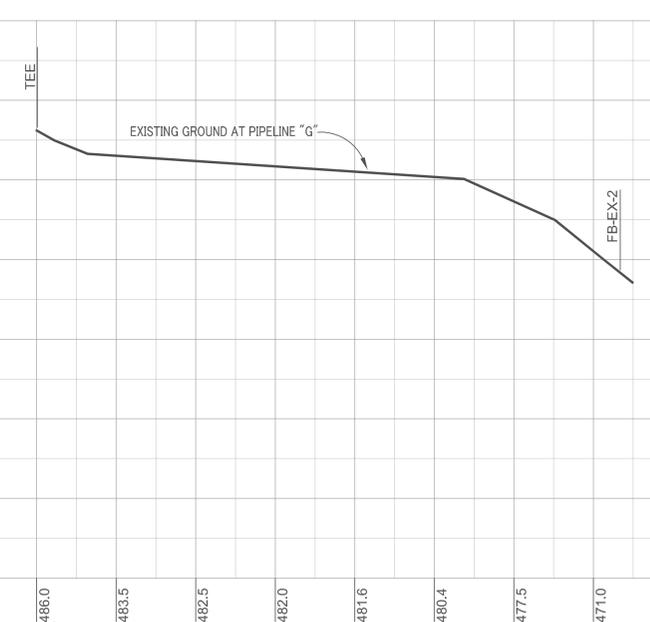
PIPELINE "G" - PLAN VIEW
SCALE: 1"=40'

PIPELINE "G" - PLAN VIEW
SCALE: 1"=40'

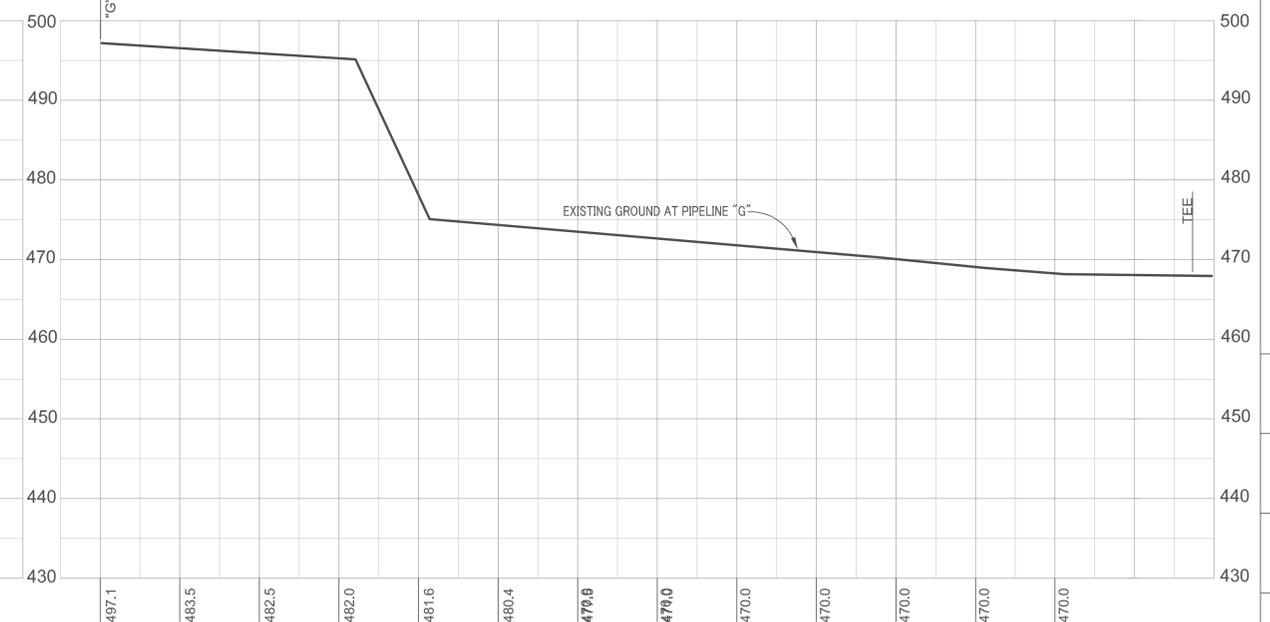
LEGEND	
	ABOVE GROUND PIPE
	UNDERGROUND PIPE
	BORE AND JACK PIPE
	ON EXISTING BRIDGE
	EXISTING GAS LINE
	FW-INJ-X INJECTION WELL
	FP-EX-X EXTRACTION WELL
	IRZ-X WELL INJEXT VARIES



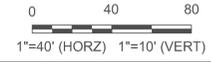
PIPELINE "G" - PROFILE
SCALE: 1"=40' HORIZ
1"=10' VERT



PIPELINE "G" - PROFILE
SCALE: 1"=40' HORIZ
1"=10' VERT



PIPELINE "G" - PROFILE
SCALE: 1"=40' HORIZ
1"=10' VERT



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DATUM:	HORIZONTAL: 40'	PROJECTION:	
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REFERENCE DWGS:			
SCALES:	1 inch = 40'		
	1 centimeter =		

REVISIONS			
NO.	DATE	DESCRIPTION	APPD. NO. DATE
1	11/14/11	30% SUBMITTAL	

APPRD BY	AUTHORIZATION
BY PES	
DR MAR	
CH	
O.K.	
DATE	

TOPOCK GROUNDWATER REMEDIATION PROJECT
PLAN AND PROFILE
 PIPELINE "G" - STA XX+XX TO STA XX+XX
 PACIFIC GAS AND ELECTRIC COMPANY
 SAN FRANCISCO, CALIFORNIA

JCN _____
 AREA _____
 COUNTY _____
 PROFILE _____

SHEET NO. _____ OF _____
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C-38

ABBREVIATIONS:

ACOUS.	ACOUSTICAL
ADMIN.	ADMINISTRATION
AFF	ABOVE FINISH FLOOR
AL.	ALUMINUM
&	AND
A	ARCHITECTURAL
@	AT
B & B	BALLED & BURLAPPED
BSMT.	BASEMENT
BM.	BEAM
BLK.	BLOCK
BD.	BOARD
BOT.	BOTTOM
BC	BRICK COURSES
BLDG.	BUILDING
CAB.	CABINET
CIP	CAST IN PLACE
CLG.	CEILING
C/S	CIVIL SANITARY
CLO.	CLOSET
COL.	COLUMN
CONC.	CONCRETE
CB	CONCRETE BLOCK
CONT.	CONTINUOUS
CJ	CONTROL JOINT
CTSK.	COUNTERSINK
CU.	CUBIC
CL.	CLEAR
DETS.	DETAILS
DIA.	DIAMETER
DIM.	DIMENSION
DO	DOOR OPENING
DR.	DOOR
DN.	DOWN
DOW.	DOWEL
DWG.	DRAWING
DF	DRINKING FOUNTAIN
EA.	EACH
E	EAST
EWC	ELECTRIC WATER COOLER
ELEC.	ELECTRICAL
EL.	ELEVATION
ENGR.	ENGINEER
EQ.	EQUAL
EQUIP.	EQUIPMENT
EXIST.	EXISTING
EXP.	EXPANSION
EJ	EXPANSION JOINT
EXT.	EXTERIOR
FRP	FIBER REINFORCED PLASTIC
FWP	FIBROUS WOOD PANEL
FIN.	FINISH
FIN. FL.	FINISH FLOOR
FE	FIRE EXTINGUISHER
FL.	FLOOR
FD	FLOOR DRAIN
GA.	GAGE
GALV.	GALVANIZED
GL.	GLASS
GSFT	GLAZED STRUCTURAL FACE TILE
GR.	GRADE
GCFFB	GROUND AND CEMENTITIOUS FILLED FACE CONCRETE BLOCK
GCFFB	GROUND AND CEMENTITIOUS FILLED FACE - SLOTTED ACOUSTICAL BLOCK
GYP.	GYPSONUM
HDN.	HARDENER
HDW.	HARDWARE
HVAC	HEATING, VENTILATING AND AIR CONDITIONING
HDCT	HEAVY DUTY CONCRETE TOPPING
HT.	HEIGHT
HP	HIGH POINT
HM	HOLLOW METAL
HORIZ.	HORIZONTAL
INFO.	INFORMATION
ID	INSIDE DIMENSION
INSUL.	INSULATION
INT.	INTERIOR

JC	JANITOR'S CLOSET
JT.	JOINT
LAB.	LABORATORY
LAV.	LAVATORY
LP	LOW POINT
MFR.	MANUFACTURER
MAT'L.	MATERIAL
MAX.	MAXIMUM
MECH.	MECHANICAL
MTL.	METAL
MEZZ.	MEZZANINE
MIN.	MINIMUM
MOD.	MODULAR
N	NORTH
NTS	NOT TO SCALE
NO.	NUMBER
OC	ON CENTER
OPNG.	OPENING
OPP.	OPPOSITE
OD	OUTSIDE DIAMETER
OHCD	OVERHEAD COILING DOOR
OHSD	OVERHEAD SLIDING DOOR
PTD.	PAINTED
PNL.	PANEL
PART.	PARTITION
P	PLASTER
PL.	PLATE
PVC	POLYVINYL CHLORIDE
PVF	POLYVINYL FLUORIDE
PCP	PORTLAND CEMENT PLASTER
PSF	POUNDS PER SQUARE FOOT
PJ	PREMOLDED JOINT
QUAN.	QUANTITY
QT	QUARRY TILE
RAD.	RADIUS
R	RISER
REF.	REFERENCE
REINF.	REINFORCING
REQ'D.	REQUIRED
RD	ROOF DRAIN
RM.	ROOM
RO	ROUGH OPENING
SECT.	SECTION
SHT.	SHEET
SMS	SHEET METAL SCREWS
S	SOUTH
SPECS.	SPECIFICATIONS
SQ.	SQUARE
S.STL.	STAINLESS STEEL
STD.	STANDARD
STA.	STATION
STOR.	STORAGE
STRUCT.	STRUCTURAL
SUSP.	SUSPENDED
TER	TERRAZZO
TC	TERRA COTTA
THKN'S.	THICKNESS
TOS	TOP OF STEEL
TOP.	TOPPING
TSM.	TRANSOM
T	TREAD
TYP	TYPICAL
UL	UNDERWRITER'S LABORATORIES
U.O.N.	UNLESS OTHERWISE NOTED
VAR.	VARIES
VERT.	VERTICAL
VP	VISION PANEL
WT.	WEIGHT
W	WEST
W/	WITH
W/O	WITHOUT
WD.	WOOD

SYMBOLS:

	STRUCTURAL COLUMN CENTERLINE
	EXISTING COLUMN CENTERLINE
#	NUMBER
	ACCESSORY, LAB FURNITURE & EQUIPMENT KEY
	UL RATED DOOR AND FRAME IN HOURS
	FIRE RESISTANCE RATING IN HOURS
	FIRE EXTINGUISHER LOCATIONS
	BUILDING ELEVATION THIS SIDE
	CENTERLINE
	DIAMETER
	EXIT SIGN LOCATION
	WALL ELEVATION SYMBOL WALL NUMBER
	DOOR NUMBER SYMBOL
	DOOR TYPE
	ROOM NUMBER
	CEILING FINISH SYMBOL
	HEIGHT ABOVE FINISH FLOOR
	WALL PARTITION TYPE
	ROOF DRAIN
	SIZE & TRIBUTARY AREA
	DEMOLITION
	NEW CONSTRUCTION
	EXISTING CONSTRUCTION

FOLD

FOLD

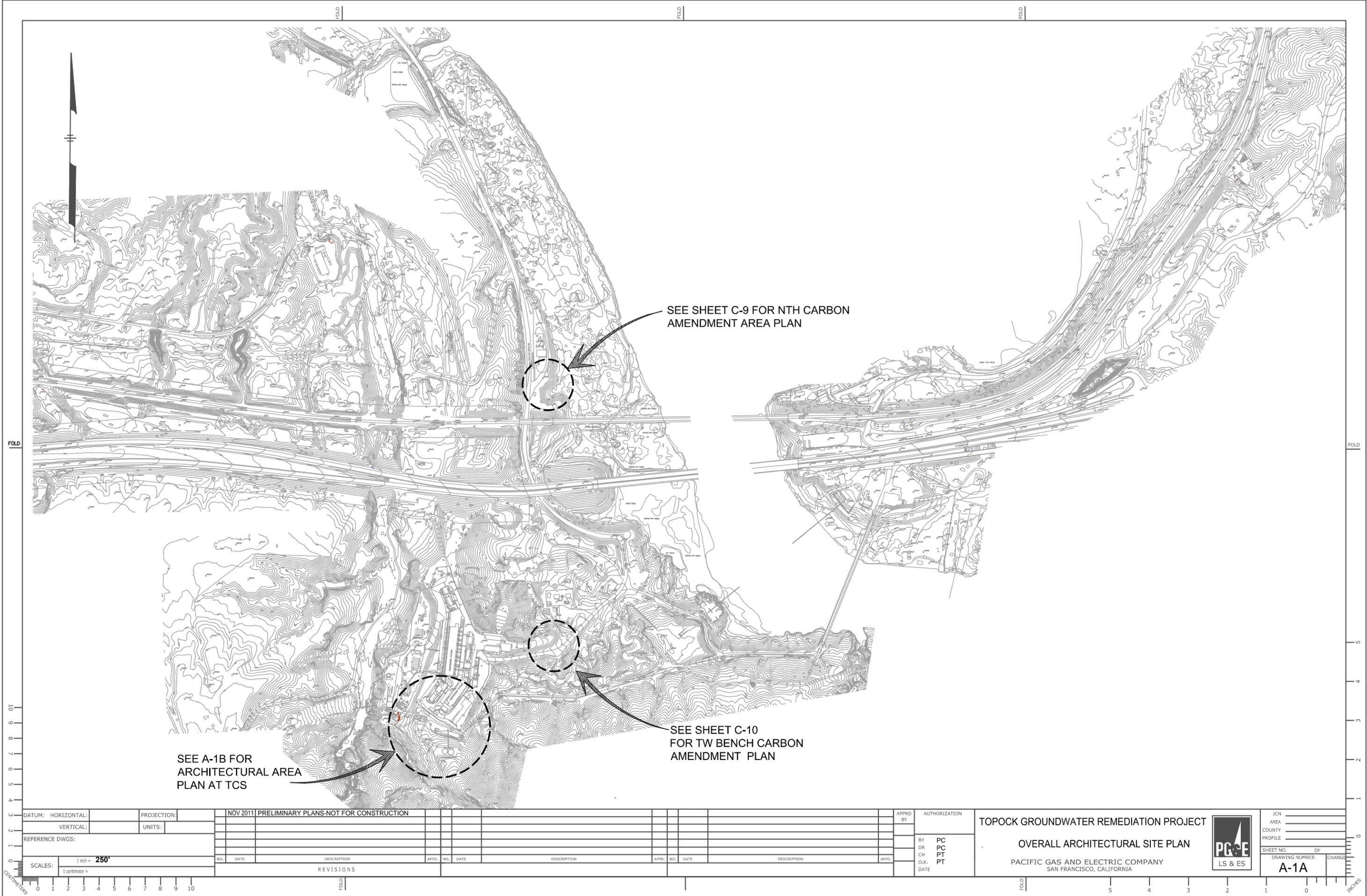
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DATUM: HORIZONTAL:	PROJECTION:	NOV 2011	PRELIMINARY PLANS-NOT FOR CONSTRUCTION	APPRD BY	AUTHORIZATION
VERTICAL:	UNITS:				
REFERENCE DWGS:					
SCALES:	1 inch =				
	1 centimeter =				
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				REVISIONS	

TOPOCK GROUNDWATER REMEDIATION PROJECT	JCN	AREA
GENERAL ARCHITECTURAL NOTES AND DETAILS	COUNTY	PROFILE
PACIFIC GAS AND ELECTRIC COMPANY SAN FRANCISCO, CALIFORNIA	SHEET NO.	OF
	DRAWING NUMBER	CHANGE
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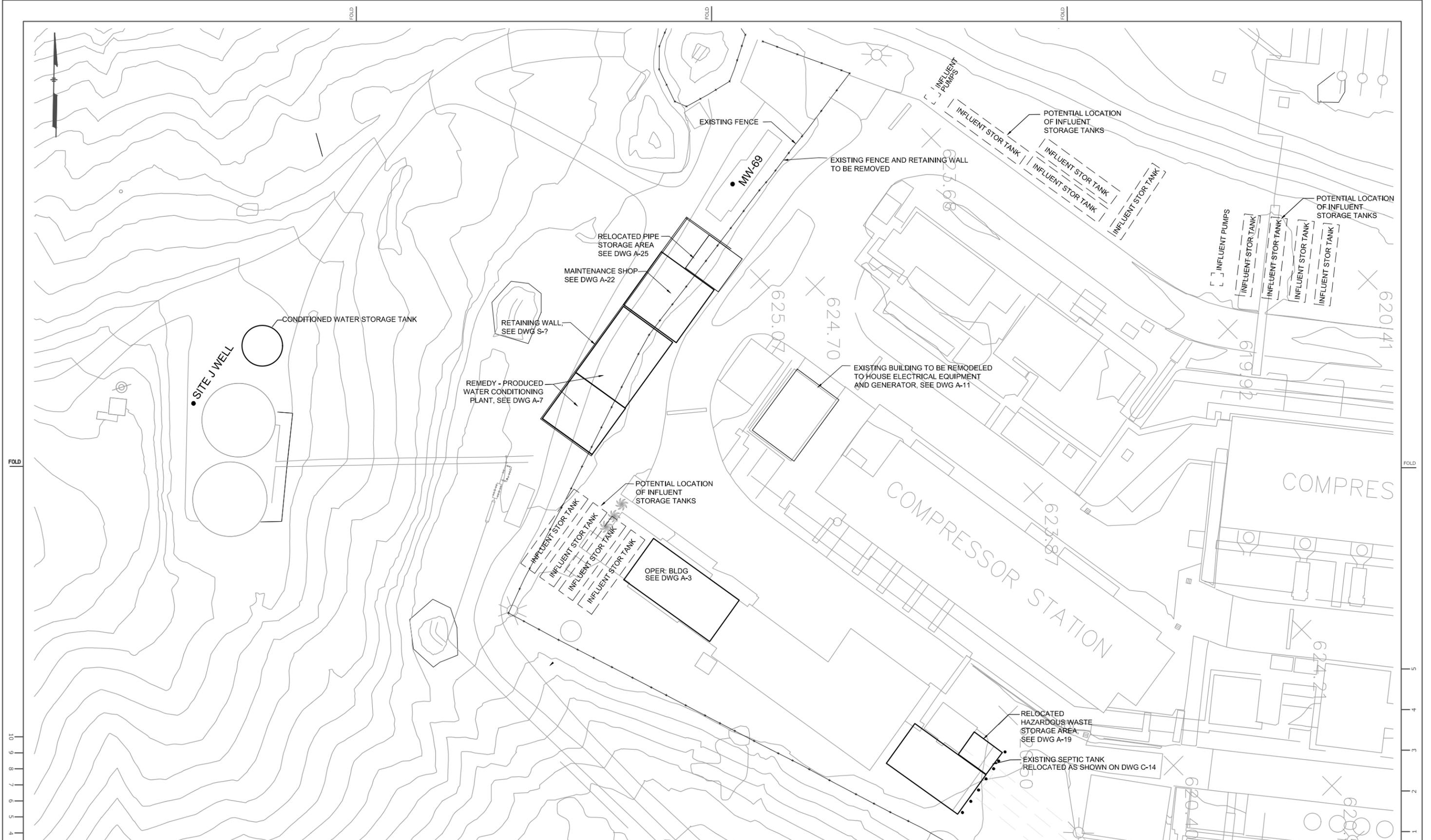


SEE A-1B FOR
ARCHITECTURAL AREA
PLAN AT TCS

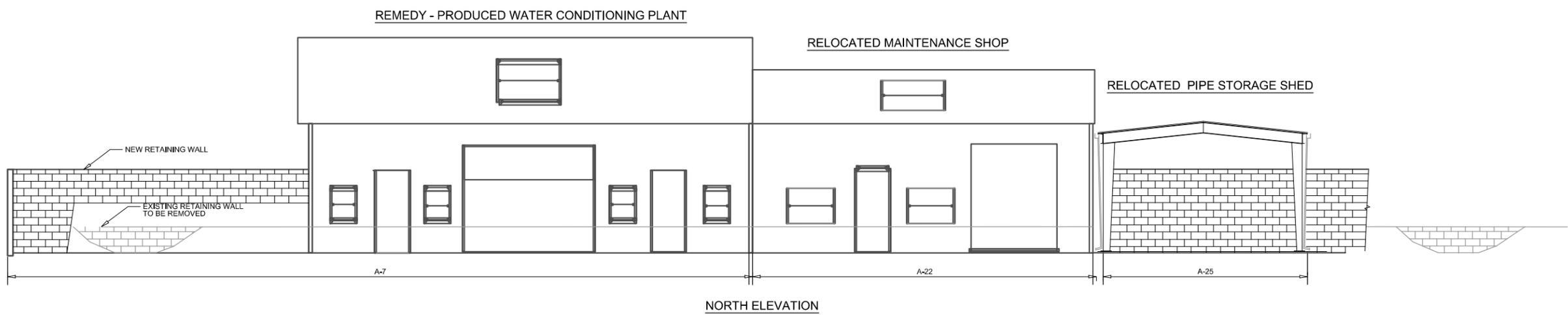
SEE SHEET C-9 FOR NTH CARBON
AMENDMENT AREA PLAN

SEE SHEET C-10
FOR TW BENCH CARBON
AMENDMENT PLAN

DATUM: HORIZONTAL:		PROJECTION:		NOV 2011 PRELIMINARY PLANS-NOT FOR CONSTRUCTION		APPRD BY:		AUTHORIZATION	
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REFERENCE DWGS:									
SCALES:		1 inch = 250'		NO. DATE		DESCRIPTION		APPRD. NO. DATE	
1 centimeter =				REVISIONS					
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								SHEET NO. OF DRAWING NUMBER CHANGE A-1A	



DATUM: HORIZONTAL:		PROJECTION:		NOV 2011 PRELIMINARY PLANS-NOT FOR CONSTRUCTION												APPRD BY:		AUTHORIZATION:		TOPOCK GROUNDWATER REMEDIATION PROJECT TCS ARCHITECTURAL SITE PLAN PACIFIC GAS AND ELECTRIC COMPANY SAN FRANCISCO, CALIFORNIA						JCN AREA COUNTY PROFILE SHEET NO. OF DRAWING NUMBER OF A-1B	
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REFERENCE DWGS:																DR:		PC									
SCALES:																CH:		PT									
1 inch = 20'-0"																O.K.:		PT									
1 centimeter =																DATE:											
				REVISIONS																							



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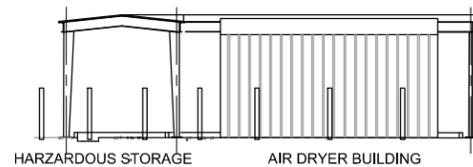
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REFERENCE DWGS:									
SCALES: 1 inch = 1/5"=1'-0"		1 centimeter =							
REVISIONS									
NO.	DATE	DESCRIPTION	APPRD.	NO.	DATE	DESCRIPTION	APPRD.	NO.	DATE

BY	PC
DR	PC
CH	PT
O.K.	PT
DATE	

TOPOCK GROUNDWATER REMEDIATION PROJECT
 ARCHITECTURAL ELEVATIONS - NORTH
 PACIFIC GAS AND ELECTRIC COMPANY
 SAN FRANCISCO, CALIFORNIA

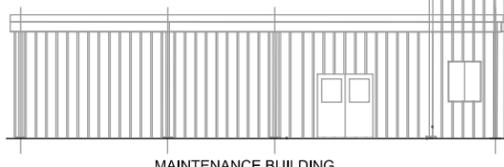


JCN	AREA	COUNTY	PROFILE
SHEET NO.	OF	DRAWING NUMBER	CHANGE
A-1C			

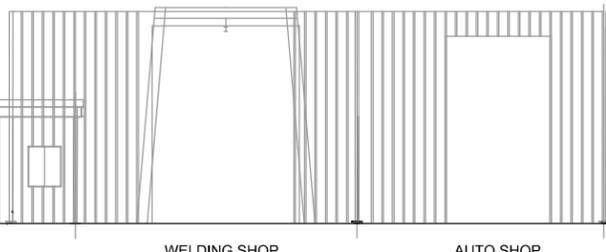


HARZARDOUS STORAGE

AIR DRYER BUILDING

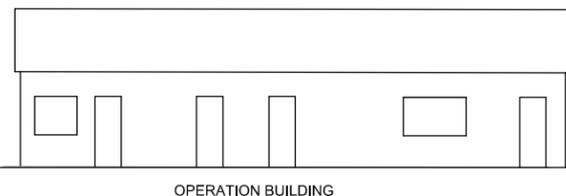


MAINTENANCE BUILDING

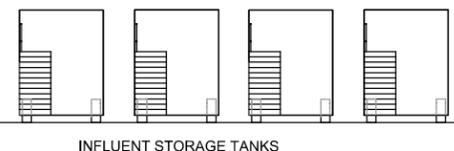


WELDING SHOP

AUTO SHOP



OPERATION BUILDING



INFLUENT STORAGE TANKS

FOLD

FOLD

10
9
8
7
6
5
4
3
2
1
0
CENTIMETERS

5
4
3
2
1
0
INCHES

DATUM: HORIZONTAL: PROJECTION: UNITS:

NOV 2011 PRELIMINARY PLANS-NOT FOR CONSTRUCTION

REFERENCE DWGS:

SCALES: 1 inch = 1/4"=1'-0"
1 centimeter =

NO. DATE DESCRIPTION APPD. NO. DATE

REVISIONS

APPD. NO. DATE DESCRIPTION APPD. NO. DATE DESCRIPTION APPD. NO. DATE DESCRIPTION

APPRD BY: PC
DR: PC
CH: PT
O.K.: PT
DATE:

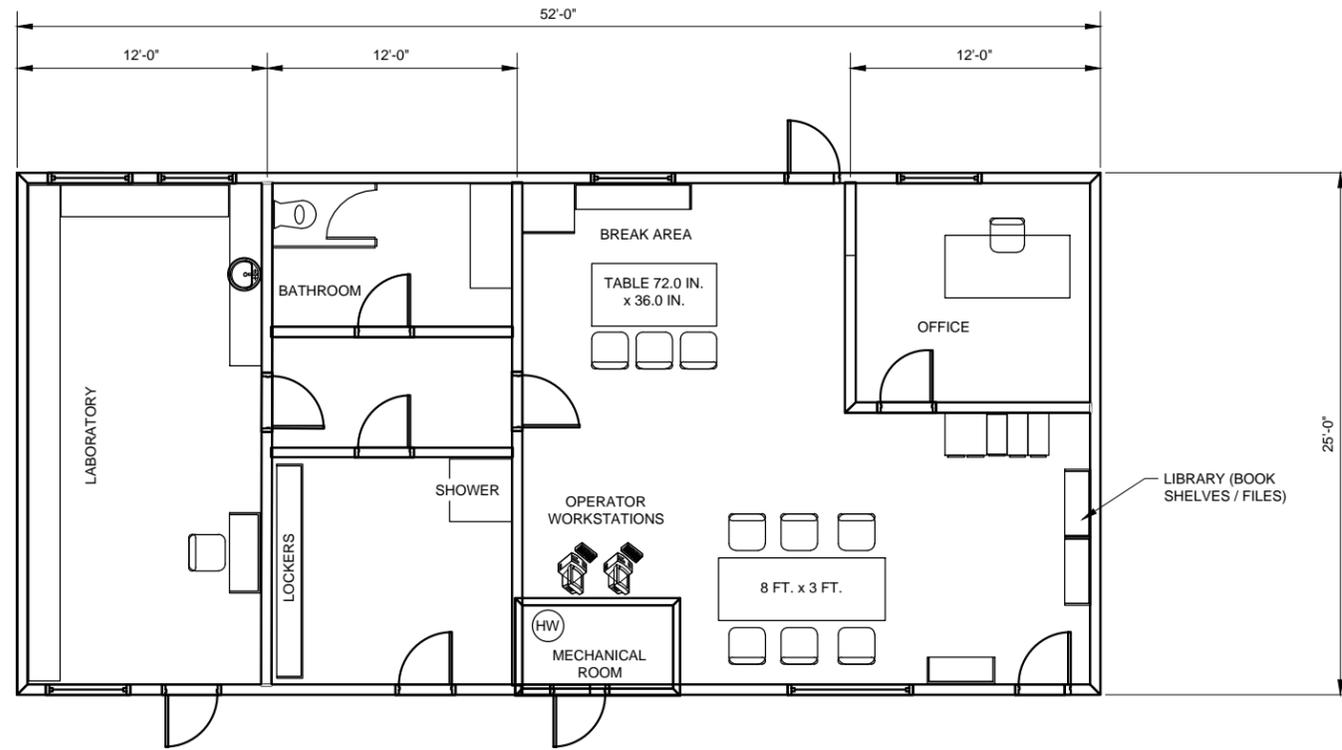
AUTHORIZATION

TOPOCK GROUNDWATER REMEDIATION PROJECT
ARCHITECTURAL ELEVATIONS - WEST

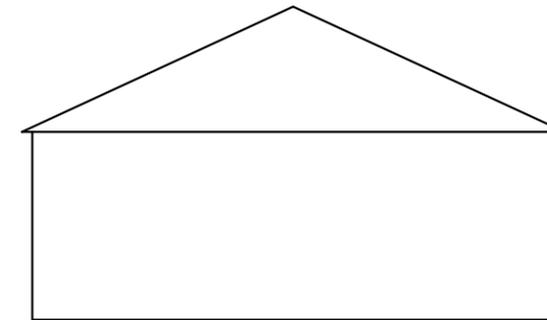
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA



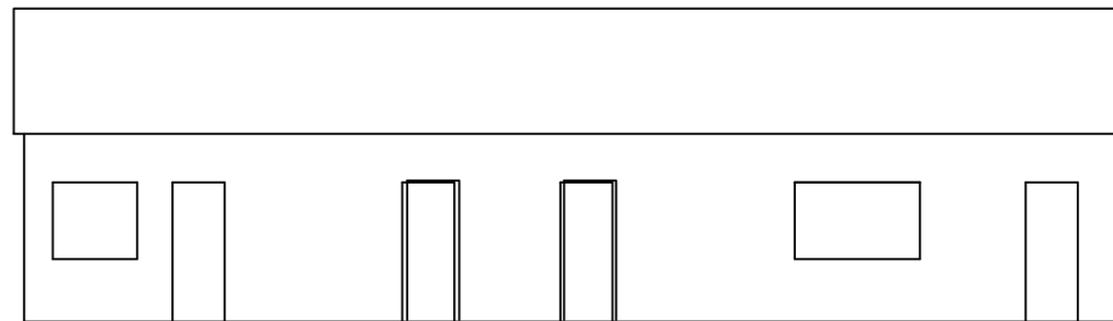
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AREA: _____
COUNTY: _____
PROFILE: _____
SHEET NO. OF _____
DRAWING NUMBER OF CHANGE
A-1D



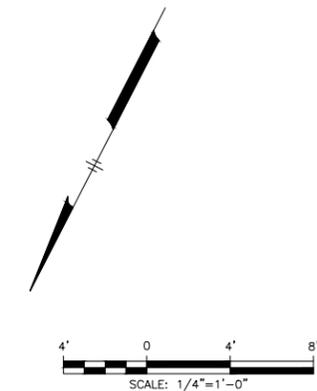
FLOOR PLAN



SOUTH ELEVATION



WEST ELEVATION



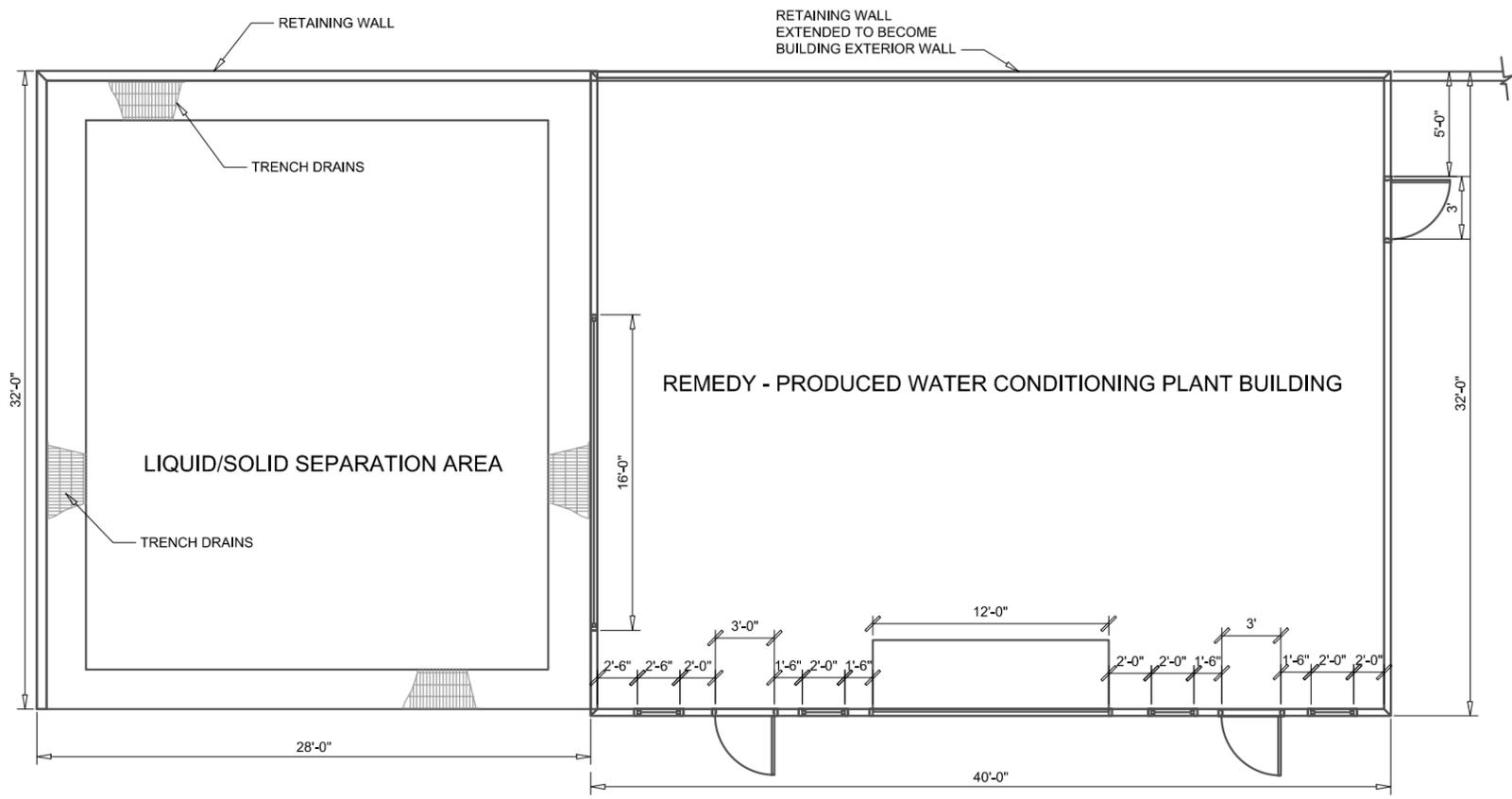
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VERTICAL:		UNITS:						BY:			
REFERENCE DWGS:				NO.		DATE		DESCRIPTION		APPRD. NO. DATE	
SCALES:		1 inch =		REVISIONS							
1 centimeter = 4"											

TOPOCK GROUNDWATER REMEDIATION PROJECT
OPERATIONS BUILDING
FLOOR PLAN AND ELEVATIONS
 PACIFIC GAS AND ELECTRIC COMPANY
 SAN FRANCISCO, CALIFORNIA



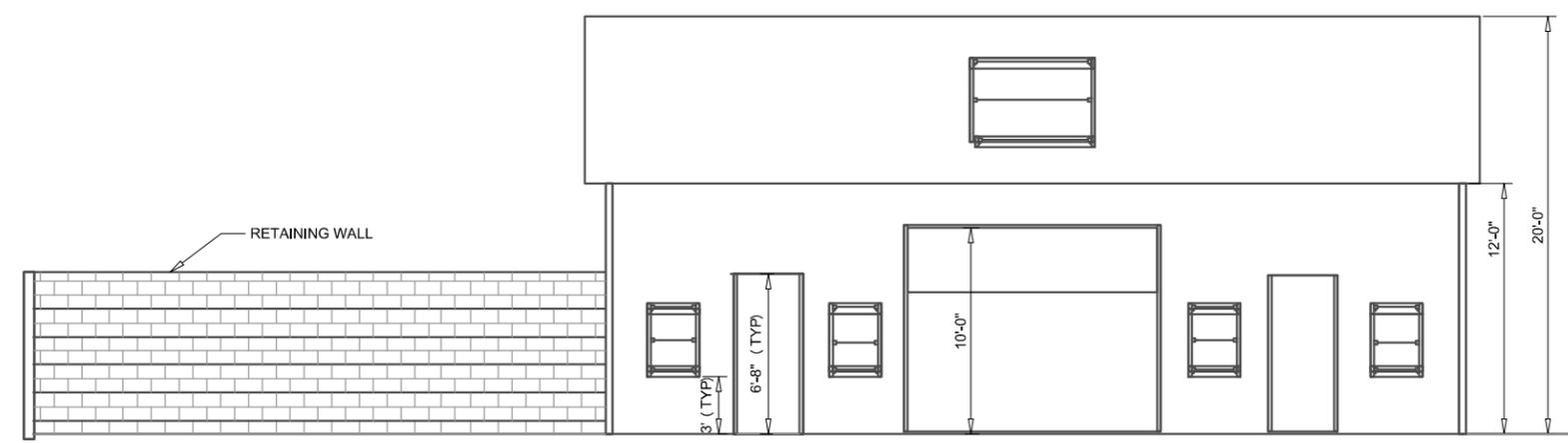
ICN	AREA	COUNTY	PROFILE
SHEET NO.	OF	DRAWING NUMBER	CHANGE

A-3

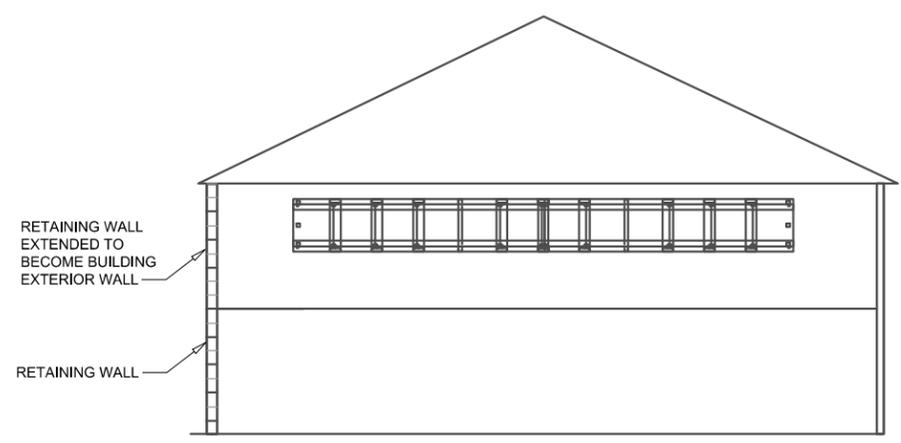


FLOOR PLAN

NOTE: SEE SHEET M-7 FOR PIPING AND EQUIPMENT



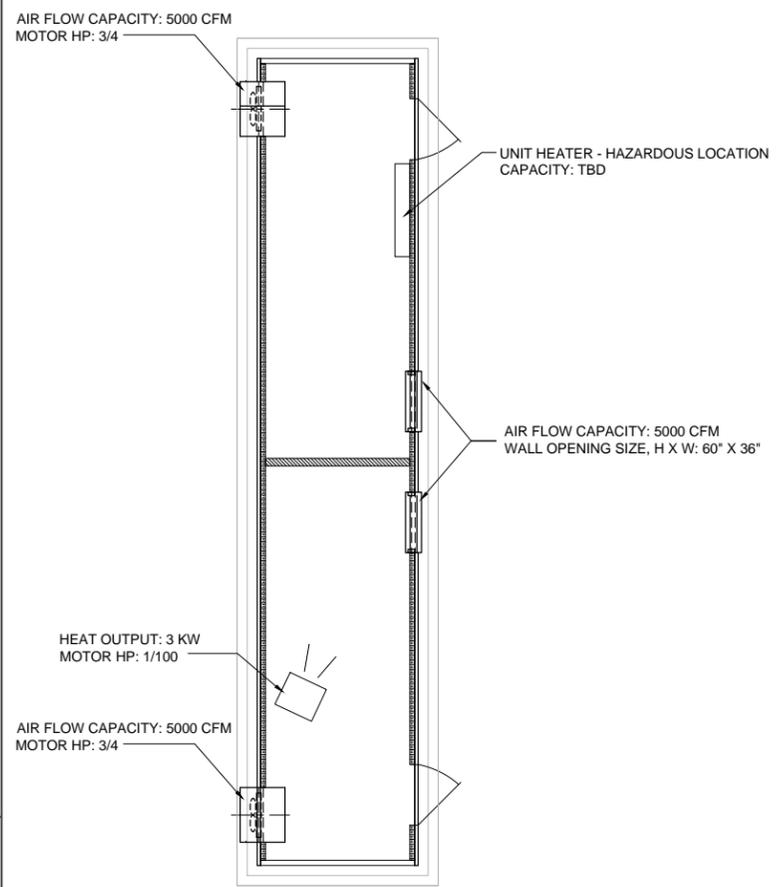
NORTH ELEVATION



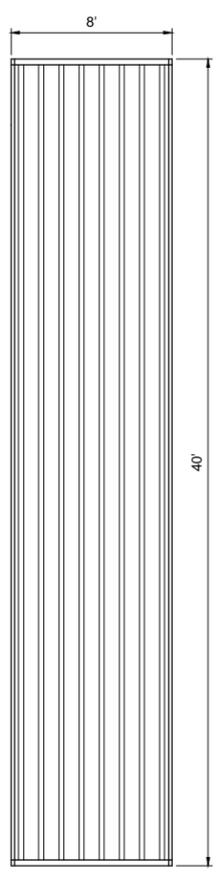
EAST ELEVATION

DATUM: HORIZONTAL:		PROJECTION:		NOV 2011 PRELIMINARY PLANS-NOT FOR CONSTRUCTION										APPRD BY:		AUTHORIZATION:		TOPOCK GROUNDWATER REMEDIATION PROJECT						ICN AREA COUNTY PROFILE	
VERTICAL:		UNITS:												BY:		PC		REMEDY - PRODUCED WATER CONDITIONING PLANT				SHEET NO. OF			
REFERENCE DWGS:														DR:		PC		FLOOR PLAN AND ELEVATIONS				DRAWING NUMBER			
SCALES: 1 inch = 1/4"=1'-0"														O.K.:		PT		PACIFIC GAS AND ELECTRIC COMPANY				CHANGE			
1 centimeter =														DATE:		PT		SAN FRANCISCO, CALIFORNIA				A-7			
REVISIONS																									

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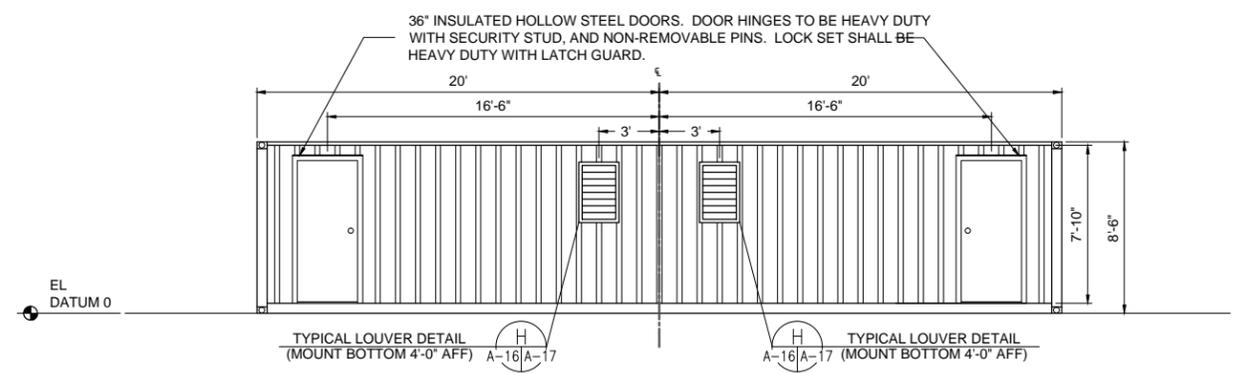
(A) TW BENCH CARBON AMENDMENT BUILDING INTERIOR PLAN
1/4" = 1'0"



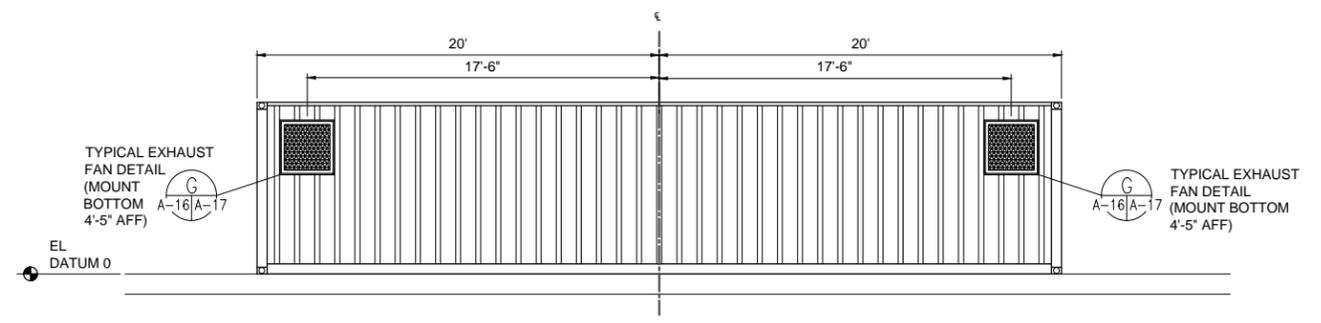
(B) TW BENCH CARBON AMENDMENT BUILDING ROOF PLAN
1/4" = 1'0"

NOTES:

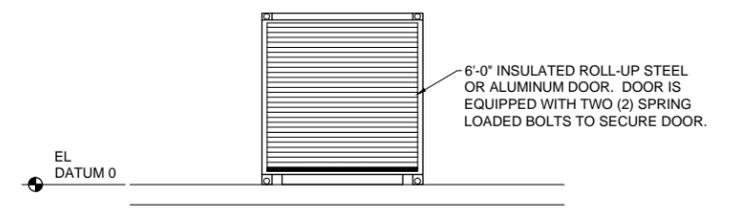
1. BOXOUTS REINFORCED TO MAINTAIN BEARING CAPACITY OF THE FLOOR.
2. MAIN NODE AND SUBNODE BUILDINGS CONSIST OF PRE-INSULATED SHIPPING CONTAINERS. THE INTERIOR OF THE CONTAINER OVERLAIN BY 3-INCHES OF FOAM INSULATION COVERED BY A STAINLESS STEEL SHEET.
3. PRE-INSULATED CONTAINERS HAVE THE FOLLOWING DIMENSIONS IN ACCORDANCE WITH SPECIFICATIONS (H X W X L): EXTERIOR: 8'-6" X 8'-0" X 40'-0" INTERIOR: 7'-10" X 7'-8" X 39'-5"



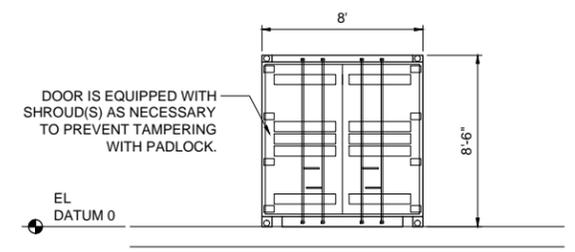
(C) TW BENCH CARBON AMENDMENT BUILDING NORTH ELEVATION
1/4" = 1'0"



(D) TW BENCH CARBON AMENDMENT BUILDING SOUTH ELEVATION
1/4" = 1'0"



(E) TW BENCH CARBON AMENDMENT BUILDING EAST ELEVATION
1/4" = 1'0"



(F) TW BENCH CARBON AMENDMENT BUILDING WEST ELEVATION
1/4" = 1'0"

DATE: NOV 2011		PROJECT: PRELIMINARY PLANS - NOT FOR CONSTRUCTION	
DRAFTSMAN: JB		CHECKER: CK	
DATE: 11/15/2011		PROJECT: TOPOCK GROUNDWATER REMEDIATION PROJECT	
SCALE: 1/4" = 1'0"		SHEET NO. OF: 1 OF 1	
DRAWING NUMBER: A-16		CHANGE: 0	

TOPOCK GROUNDWATER REMEDIATION PROJECT
TW BENCH CARBON AMENDMENT BUILDING PLANS AND ELEVATIONS
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

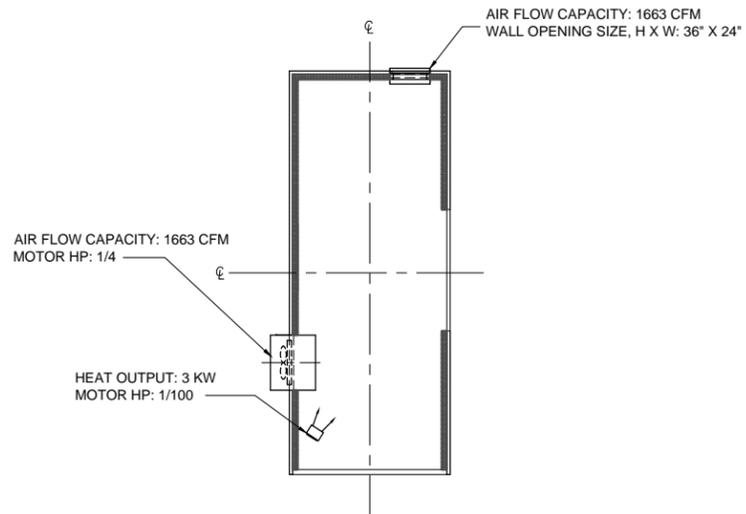


JCN	AREA	COUNTY	PROFILE
SHEET NO.	OF	DRAWING NUMBER	CHANGE
		A-16	

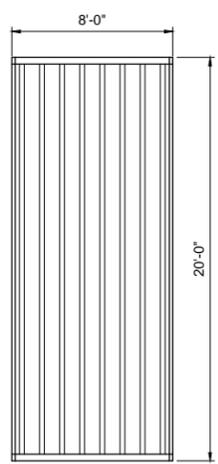
CENTIMETERS

INCHES

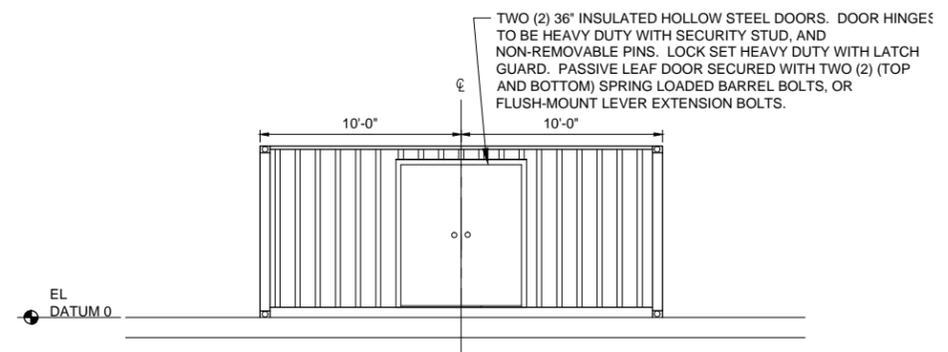
G:\Project\RC000753.0008\Drawing\current\30% - Final\ARCH 2 - SubNode Building Plans, Sections, Elevations, and Details.dwg , A-17, 11/15/2011 7:13:59 PM



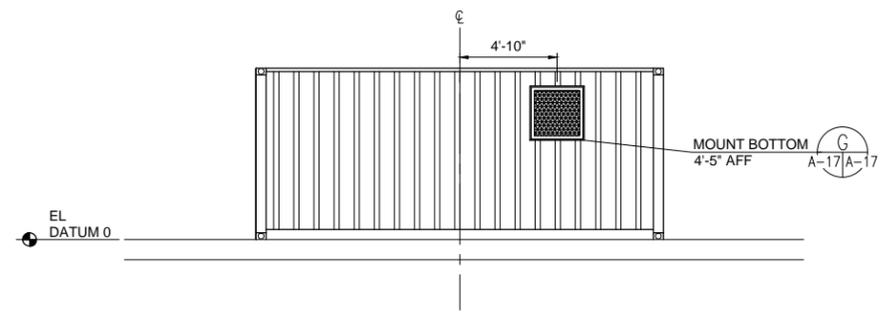
A ELECTRICAL NODE BUILDING INTERIOR PLAN (TYP. FOR 2)
1/4" = 1'0"



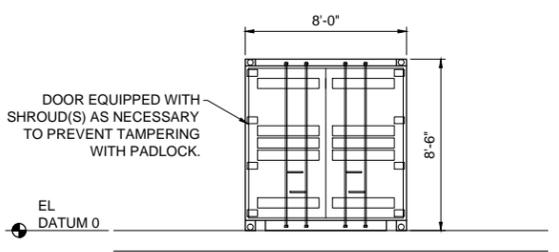
B ELECTRICAL NODE BUILDING ROOF PLAN (TYP. FOR 2)
1/4" = 1'0"



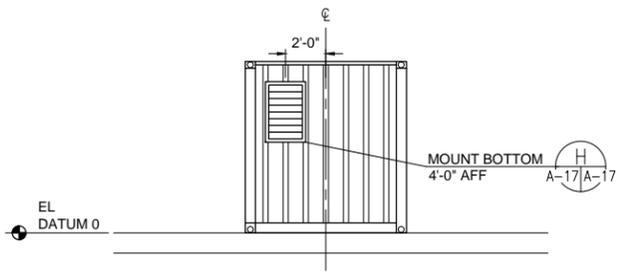
C ELECTRICAL NODE BUILDING WEST ELEVATION (TYP. FOR 2)
1/4" = 1'0"



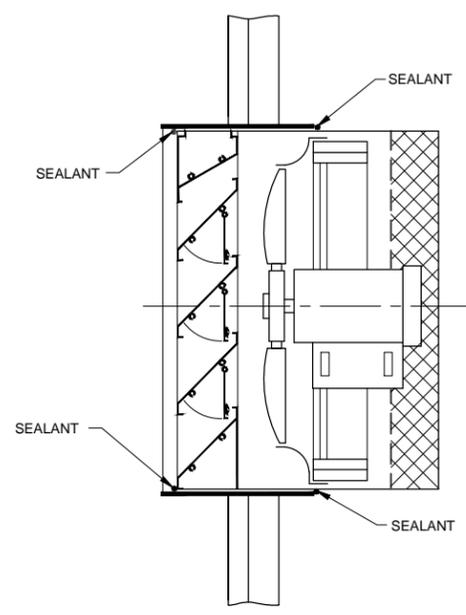
D ELECTRICAL NODE BUILDING EAST ELEVATION (TYP. FOR 2)
1/4" = 1'0"



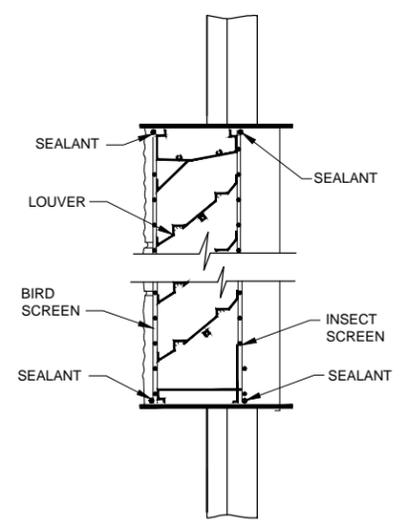
E ELECTRICAL SUBNODE BUILDING SOUTH ELEVATION (TYP. FOR 2)
1/4" = 1'0"



F ELECTRICAL NODE BUILDING NORTH ELEVATION (TYP. FOR 2)
1/4" = 1'0"



G TYPICAL EXHAUST FAN DETAIL
NOT TO SCALE



H TYPICAL LOUVER DETAIL
NOT TO SCALE

DATUM: HORIZONTAL:	PROJECTION:	NOV 2011	PRELIMINARY PLANS - NOT FOR CONSTRUCTION	APPR BY:	AUTHORIZATION:
VERTICAL:	UNITS:				
REFERENCE DWGS:					
NO.	DATE	DESCRIPTION	APPR. NO.	DATE	DESCRIPTION
REVISIONS					
SCALES:	1 inch =				
	1 centimeter =				

TOPOCK GROUNDWATER REMEDIATION PROJECT

ELECTRICAL NODE BUILDING PLANS AND ELEVATIONS

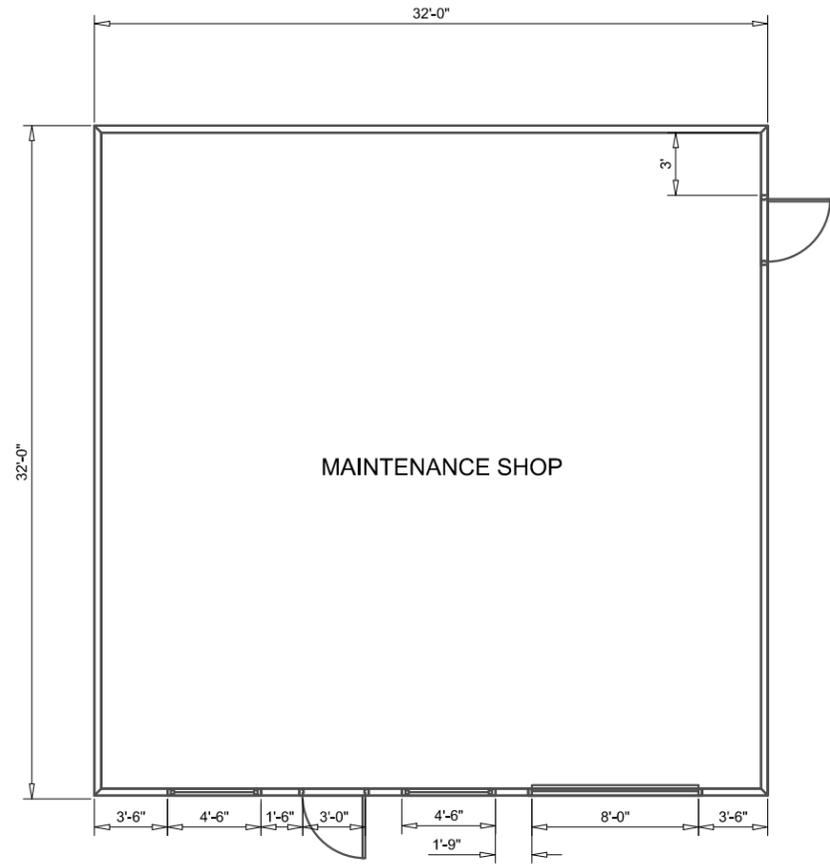
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

JCN _____
AREA _____
COUNTY _____
PROFILE _____

SHEET NO. _____ OF _____
DRAWING NUMBER _____
A-17

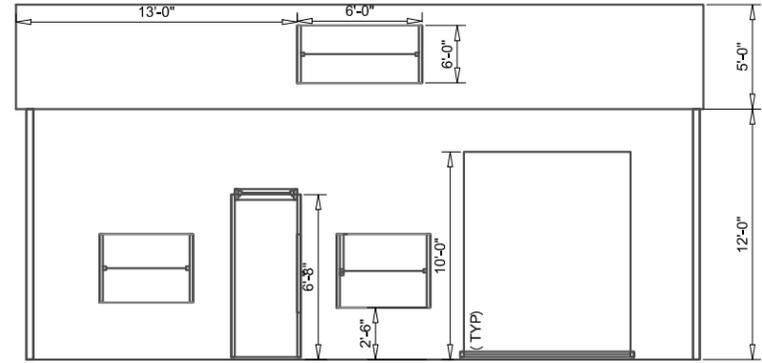
0 1 2 3 4 5 6 7 8 9 10 CENTIMETERS

0 1 2 3 4 5 INCHES

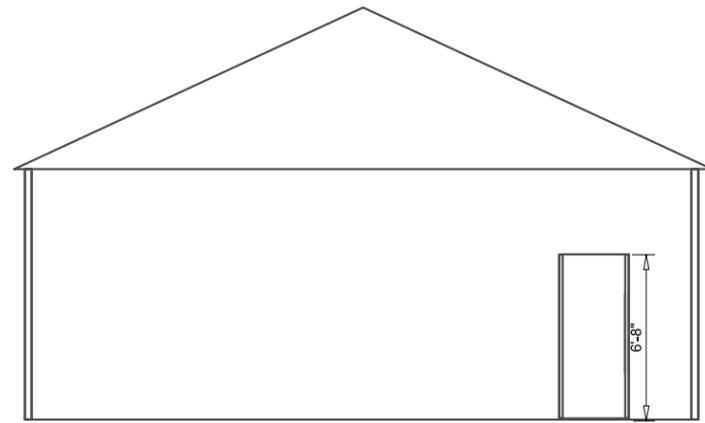


MAINTENANCE SHOP

FLOOR PLAN



NORTH ELEVATION



WEST ELEVATION

DATUM: HORIZONTAL:		PROJECTION:		NOV 2011 PRELIMINARY PLANS-NOT FOR CONSTRUCTION												APPRD BY:		AUTHORIZATION	
VERTICAL:		UNITS:														BY: PC		DATE:	
REFERENCE DWGS:																DR: PC			
SCALES:		1 inch = 1/4"=1'-0"														O.K.: PT			
1 centimeter =																DATE:			
REVISIONS																			

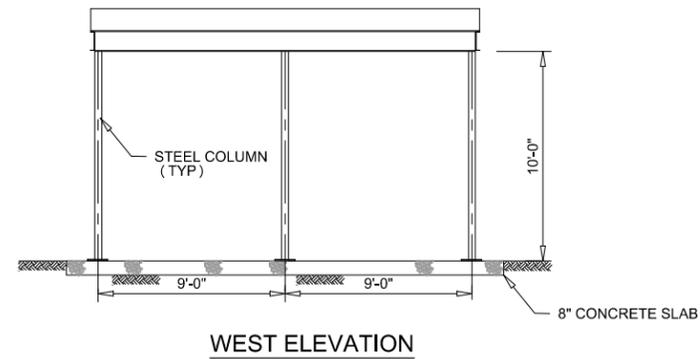
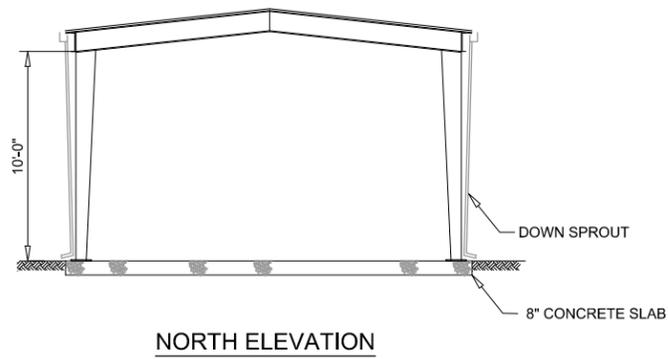
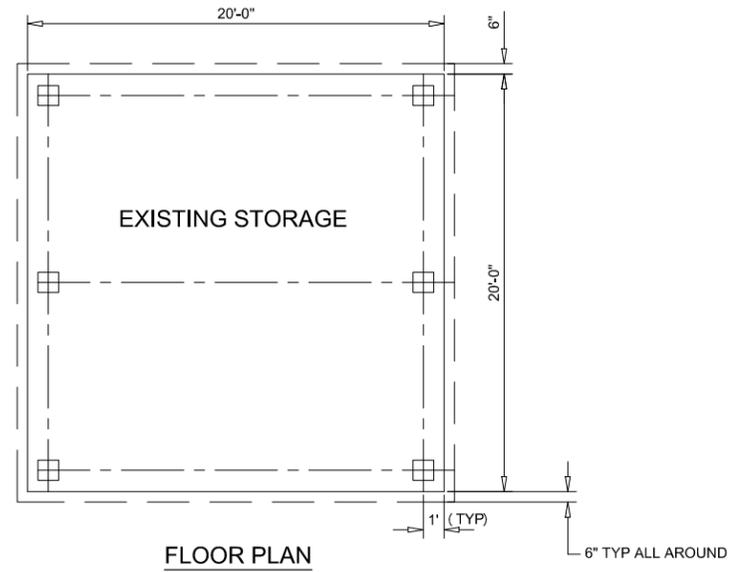
TOPOCK GROUNDWATER REMEDIATION PROJECT
 RELOCATED MAINTENANCE SHOP
 FLOOR PLAN AND ELEVATIONS
 PACIFIC GAS AND ELECTRIC COMPANY
 SAN FRANCISCO, CALIFORNIA



JCN	AREA	COUNTY	PROFILE
SHEET NO.	OF	DRAWING NUMBER	CHANGE
A-22			

10
9
8
7
6
5
4
3
2
1
0
CENTIMETERS

5
4
3
2
1
0
INCHES



DATUM:	HORIZONTAL:	PROJECTION:	NOV 2011 PRELIMINARY PLANS-NOT FOR CONSTRUCTION
	VERTICAL:	UNITS:	
REFERENCE DWGS:			
SCALES:			
1 inch = 1/4"=1'-0"			
1 centimeter =			

NO.	DATE	DESCRIPTION	APPD.	NO.	DATE	DESCRIPTION	APPD.	NO.	DATE	DESCRIPTION	APPD.
REVISIONS											

APPRD BY	AUTHORIZATION
BY	PC
DR	PC
CH	PT
O.K.	PT
DATE	

TOPOCK GROUNDWATER REMEDIATION PROJECT

RELOCATED PIPE STORAGE FLOOR PLAN

PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA



JCN	AREA	COUNTY	PROFILE
SHEET NO.	OF	DRAWING NUMBER	CHANGE
A-25			

FOLD

FOLD

10
9
8
7
6
5
4
3
2
1
0
CENTIMETERS

5
4
3
2
1
0
INCHES

GENERAL STRUCTURAL NOTES

GENERAL	CONCRETE	STRUCTURAL STEEL	ALUMINUM																																																
<p>GOVERNING CODES CALIFORNIA BUILDING CODE, 2010 AS AMENDED BY SAN BERNARDINO COUNTY ASCE 7-10 MINIMUM DESIGN LOADS FOR BUILDING AND OTHER STRUCTURE</p> <p>INTENT OF GENERAL STRUCTURAL NOTES THE INTENT OF THESE GENERAL STRUCTURAL NOTES IS TO DEFINE DESIGN PARAMETERS (LOADS AND ALLOWABLE STRESSES) FOR ALL STRUCTURES AND MATERIALS USED. SPECIFICATIONS CONTAINING MATERIALS AND INSTALLATION ARE A PART OF THIS JOB AND ARE CONTAINED ELSEWHERE.</p> <p>DESIGN THE STRUCTURES ARE DESIGNED TO BE STABLE AND SELF-SUPPORTING WHEN ERRECTED AND FULLY COMPLETED. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE THE ERECTION PROCEDURE, INCLUDING SEQUENCE OF CONSTRUCTION, AND TO INSURE THE SAFETY OF THE STRUCTURES DURING THE CONSTRUCTION PHASE, INCLUDING THE DESIGN AND SAFETY OF ANY TEMPORARY BRACING OR OTHER MEASURES WHICH MAY BE NECESSARY TO FACILITATE AND COMPLETE CONSTRUCTION.</p> <p>LIVE LOADS DESIGN LIVE LOADS FOR THE STRUCTURES ARE AS FOLLOWS:</p> <table border="0"> <tr><td>STAIRS</td><td>- 100 PSF</td></tr> <tr><td>CONCRETE FLOOR</td><td>- 250 PSF</td></tr> <tr><td>GRATING FLOOR</td><td>- 150 PSF</td></tr> <tr><td>ROOF</td><td>- 20 PSF</td></tr> <tr><td>ARCH BRIDGE</td><td>- 85 PSF</td></tr> </table> <p>WIND LOADS DESIGN HORIZONTAL WIND LOADS ON VERTICAL SURFACES: 20 PSF</p> <p>SEISMIC LOADS CALIFORNIA BUILDING CODE, 2010 SECTION 1613 - EARTHQUAKE LOADS $S_s = 0.24$ $S_1 = 0.22$</p> <p>FOUNDATION DESIGN SHALL BE BASED ON: GEOTECHNICAL INVESTIGATION REPORT, TOPOCK COMPRESSOR STATION BY CH2M HILL, 2004 FINAL WORKPLAN FOR TIME CRITICAL REMOVAL ACTION AT AOC4 DEBRIS RAVINE, PG&E TOPOCK COMPRESSOR STATION, NEEDLES, CA BU CH2M HILL DEC, 18, 2009</p> <p>A) MAT FOUNDATION (PUMP STATION) : ALLOW. SOIL BEARING PRESSURE = 6000 PSF</p> <p>B) RETAINING WALL: CAPACITY OF DRILLED PIERS AXIAL = 30K UPLIFT = 25K LATERAL = 13K</p> <p>C) SPREAD FOUNDATION (GENERATOR BUILDING) ALLOWABLE SOIL BEARING PRESSURE = 3,000 PSF</p> <p>GROUND WATER ELEVATION STRUCTURES ARE DESIGNED FOR A HIGH GROUND WATER LEVEL AT EL. 455.0</p> <p>COORDINATION OF WORK MECHANICAL FRAMING, OPENINGS AND SUPPORTS FOR EQUIPMENT OR OTHER PROCESS ITEMS ARE SHOWN FOR BIDDING PURPOSES ONLY. THE EXACT SIZE AND LOCATION OF SUCH ITEMS SHALL BE VERIFIED FROM MANUFACTURER'S APPROVED SHOP DRAWINGS AND BY COORDINATION OF SUCH WORK WITH THE PERTINENT TRADE.</p> <p>MISCELLANEOUS FOR LOCATIONS AND DETAIL OF PIPES, CONDUITS, DUCTS, AND OTHER OPENINGS N SLABS AND WALLS, SEE SITEWORK, MECHANICAL, PLUMBING, HVAC, AND ELECTRICAL DRAWINGS.</p>	STAIRS	- 100 PSF	CONCRETE FLOOR	- 250 PSF	GRATING FLOOR	- 150 PSF	ROOF	- 20 PSF	ARCH BRIDGE	- 85 PSF	<p>CONCRETE DESIGN DATA</p> <p>CODE - ACI 318-11 AND 350/350R-06 BUILDING CODES FOR REINFORCED CONCRETE</p> <p>STRENGTH - F' = 3000 PSI UNLESS NOTED</p> <p>REINFORCING - ASTM A615, GRADE 60, TYPE S</p> <p>WELDED STEEL WIRE FABRIC - ASTM A185</p> <p>DESIGN - STRENGTH DESIGN METHOD OR ALTERNATE DESIGN METHOD</p> <p>DETAILING - ACI SP-66 (94) ACI DETAILING MANUAL</p> <p>STANDARD HOOKS UNLESS OTHERWISE SHOWN OR NOTED, ALL 90-, 135- AND 180- DEGREE HOOKS FOR REINFORCING SHALL BE IN ACCORDANCE WITH THE STANDARD HOOK DETAILS SHOWN IN ACI SP-66 (94) .</p> <p>REINFORCING BAR DEVELOPMENT UNLESS OTHERWISE INDICATED ON THE DRAWINGS, REINFORCING BARS SHALL BE DEVELOPED AND/OR SPLICED IN ACCORDANCE WITH THE FOLLOWING TABLE:</p> <table border="1"> <thead> <tr> <th rowspan="2">BAR SIZE</th> <th rowspan="2">Ld DEVELOPMENT LENGTH</th> <th colspan="2">TENSION LAP LAP SLICES</th> </tr> <tr> <th>* TOP BARS</th> <th>OTHER BARS</th> </tr> </thead> <tbody> <tr><td>4</td><td>1'-11"</td><td>2'-5"</td><td>1'-11"</td></tr> <tr><td>5</td><td>2'-4"</td><td>3'-0"</td><td>2'-4"</td></tr> <tr><td>6</td><td>2'-10"</td><td>3'-8"</td><td>2'-10"</td></tr> <tr><td>7</td><td>4'-1"</td><td>5'-3"</td><td>4'-1"</td></tr> <tr><td>8</td><td>4'-8"</td><td>6'-0"</td><td>4'-8"</td></tr> <tr><td>9</td><td>5'-3"</td><td>6'-9"</td><td>5'-3"</td></tr> <tr><td>10</td><td>5'-10"</td><td>7'-8"</td><td>5'-10"</td></tr> <tr><td>11</td><td>6'-0"</td><td>8'-6"</td><td>6'-0"</td></tr> </tbody> </table> <p>*HORIZONTAL BARS SO PLACED THAT MORE THAN 12 IN. OF CONCRETE IS CAST IN THE MEMBER BELOW THE BAR.</p> <p>CONCRETE PROTECTION FOR REINFORCEMENT UNLESS NOTED OTHERWISE, THE CONCRETE COVER FOR REINFORCING BARS PLACED IN SURFACES EXPOSED TO WATER SHALL BE 2 INCHES. ALL OTHER MINIMUM COVER REQUIREMENTS SHALL BE AS PER ACI 318-11.</p> <p>CONCRETE COATING SYSTEM CONCRETE COATING SYSTEM IS NOT SHOWN ON DRAWINGS. FOR COATING SYSTEM REQUIREMENTS SEE SPECIFICATION SECTION 09800.</p> <p>UTILITY VAULTS UTILITY VAULTS WILL BE PRECAST CONCRETE SECTIONS CONFORMING TO PG&E STANDARD K-35.</p>	BAR SIZE	Ld DEVELOPMENT LENGTH	TENSION LAP LAP SLICES		* TOP BARS	OTHER BARS	4	1'-11"	2'-5"	1'-11"	5	2'-4"	3'-0"	2'-4"	6	2'-10"	3'-8"	2'-10"	7	4'-1"	5'-3"	4'-1"	8	4'-8"	6'-0"	4'-8"	9	5'-3"	6'-9"	5'-3"	10	5'-10"	7'-8"	5'-10"	11	6'-0"	8'-6"	6'-0"	<p>DESIGN DATA SPECIFICATIONS</p> <p>DESIGN - AISC MANUAL OF STEEL CONSTRUCTION, ALLOWABLE STRESS DESIGN, 13th EDITION</p> <p>DESIGN - AISC TYPE #2 SIMPLE</p> <p>FRAMING CONSTRUCTION</p> <p>WIDE FLANGE SHAPES - ASTM A992 (fy = 50KSI)</p> <p>CHANNELS, PLATES & ANGLES - ASTM A36 (fy=36 KSI)</p> <p>STRUCTURAL PIPES - ASTM A53, GRADE B</p> <p>STRUCTURAL TUBES - ASTM A500, GRADE B</p> <p>WELDING - AWS E70 ELECTRODES</p> <p>HIGH STRENGTH BOLTS - ASTM A325-SC CLASS A, 3/4 INCH DIAMETER UNLESS OTHERWISE NOTED. SUFFIX SC FOLLOWING ASTM DESIGNATION DENOTES A SLIP-CRITICAL CONNECTION</p> <p>COMMON BOLTS - ASTM A307, UNLESS OTHERWISE INDICATED</p> <p>ANCHOR BOLTS - A36 UNLESS OTHERWISE INDICATED</p> <p>CHEMICAL ANCHORS (DBD) - DBD (DIFFERED BOLTING DEVICES) S.S. TYPE 316, HILTI HVA ADHESIVE</p> <p>EXPANSION ANCHORS - HILTI S.S. KWIK-BOLT S.S. TYPE 316 ANCHORS OR APPROVED EQUAL BOLTS, NUTS & WASHERS</p> <p>STAINLESS STEEL</p> <p>DESIGN DATA SPECIFICATION - ALLOY TYPES CONFORM TO ASTM A-167 & ASTM A-276</p> <p>PLATES & SHAPES - TYPE 316 UNLESS OTHERWISE NOTED</p> <p>BOLTS, NUTS, & WASHERS - TYPE 316</p>	<p>DESIGN DATA</p> <p>CODES - CALIFORNIA BUILDING CODE, 2010</p> <p>SPECIFICATION - ASTM - 6061-T6 ALLOY, UNLESS OTHERWISE NOTED.</p> <p>MASONRY</p> <p>DESIGN DATA</p> <p>CODE - CALIFORNIA BUILDING CODE (2010)</p> <p>HOLLOW LOAD BEARING - ASTM C90 F'M - COMPRESSIVE STRENGTH OF MASONRY AT 28 DAYS = 1,900 PSI</p> <p>MORTAR - ASTM C270, CONFORM WITH UBC-2007, TYPE M, MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS = 2,500 PSI</p> <p>GROUT - ASTM 476, MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS = 3,000 PSI</p> <p>REINFORCING - ASTM 615, GRADE 60</p> <p>COLD-DRAWN STEEL WIRE - ASTM 482</p>
STAIRS	- 100 PSF																																																		
CONCRETE FLOOR	- 250 PSF																																																		
GRATING FLOOR	- 150 PSF																																																		
ROOF	- 20 PSF																																																		
ARCH BRIDGE	- 85 PSF																																																		
BAR SIZE	Ld DEVELOPMENT LENGTH	TENSION LAP LAP SLICES																																																	
		* TOP BARS	OTHER BARS																																																
4	1'-11"	2'-5"	1'-11"																																																
5	2'-4"	3'-0"	2'-4"																																																
6	2'-10"	3'-8"	2'-10"																																																
7	4'-1"	5'-3"	4'-1"																																																
8	4'-8"	6'-0"	4'-8"																																																
9	5'-3"	6'-9"	5'-3"																																																
10	5'-10"	7'-8"	5'-10"																																																
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DATUM: HORIZONTAL:		PROJECTION:		NOV 2011 PRELIMINARY PLANS-NOT FOR CONSTRUCTION		APPRD BY:		AUTHORIZATION:	
VERTICAL:		UNITS:							
REFERENCE DWGS:									
SCALES: 1 inch =		NO. DATE		DESCRIPTION		APPRD. NO. DATE		DESCRIPTION	
1 centimeter =		REVISIONS							

TOPOCK GROUNDWATER REMEDIATION PROJECT

GENERAL STRUCTURAL NOTES

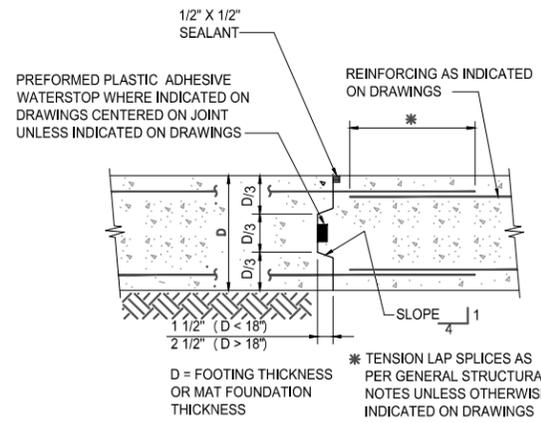
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA



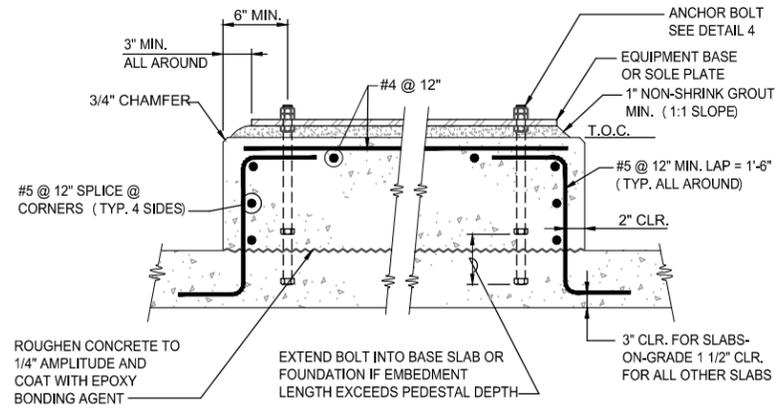
JCN
AREA
COUNTY
PROFILE

SHEET NO. OF
DRAWING NUMBER CHANGE

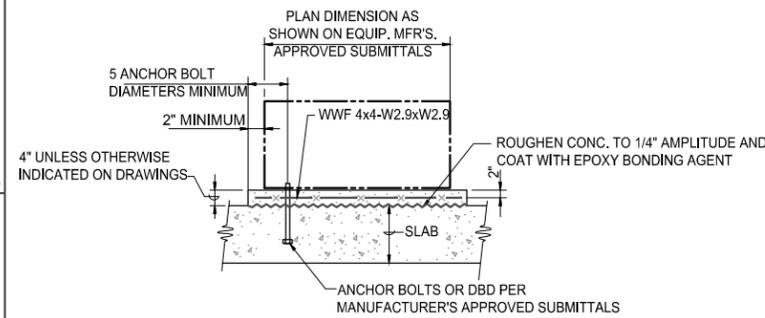
S-1



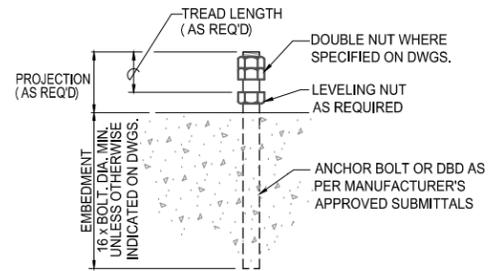
1 FOUNDATION OR BASE SLAB CONSTRUCTION JOINT DETAIL
NTS



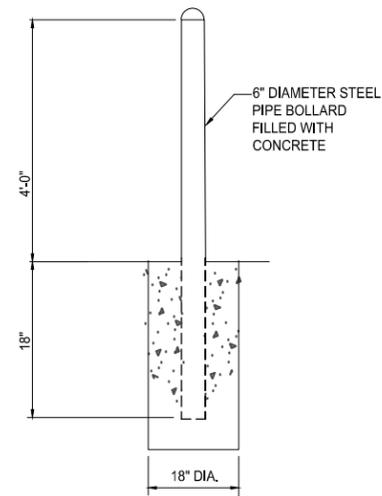
2 EQUIPMENT FOUNDATION DETAIL
NTS



3 EQUIPMENT PAD DETAIL
NTS

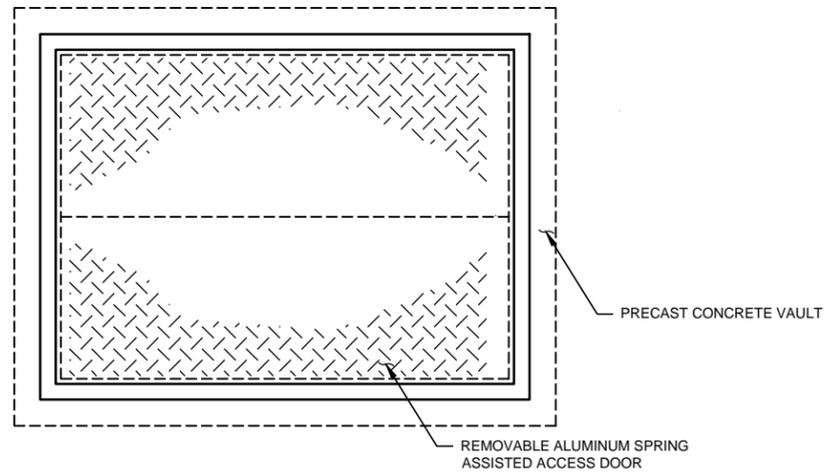


4 ANCHOR BOLT DETAIL
NTS



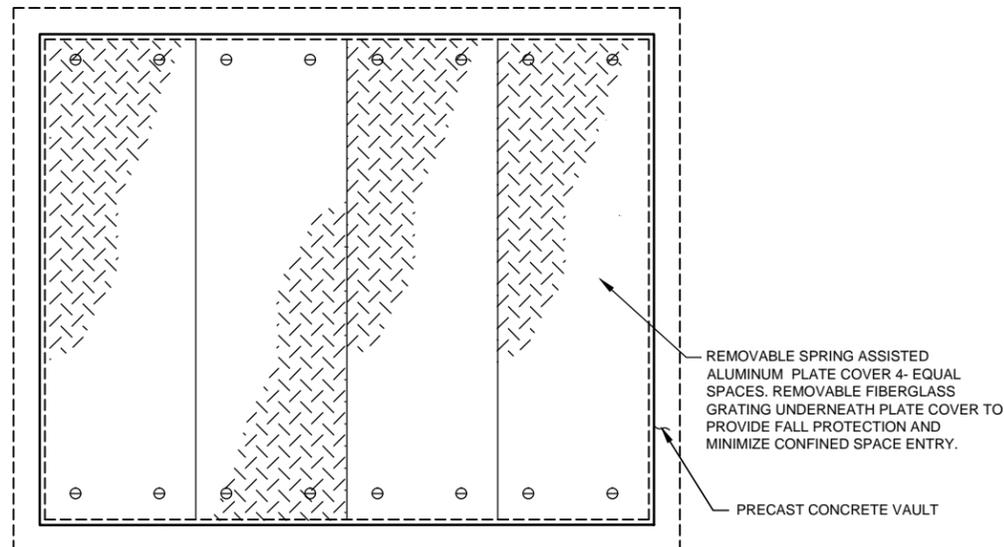
5 BOLLARD DETAIL
NTS

DATUM: HORIZONTAL:		PROJECTION:		NOV 2011 PRELIMINARY PLANS-NOT FOR CONSTRUCTION		APPRD BY:		AUTHORIZATION		TOPOCK GROUNDWATER REMEDIATION PROJECT		ICN _____ AREA _____ COUNTY _____ PROFILE _____	
VERTICAL:		UNITS:								GENERAL STRUCTURAL DETAILS		SHEET NO. _____ OF _____ DRAWING NUMBER _____ CHANGE _____ S-2	
REFERENCE DWGS:										PACIFIC GAS AND ELECTRIC COMPANY SAN FRANCISCO, CALIFORNIA			
SCALES: 1 inch = _____ 1 centimeter = _____		NO. DATE DESCRIPTION		APPRD. NO. DATE DESCRIPTION		APPRD. NO. DATE DESCRIPTION		APPRD. NO. DATE DESCRIPTION		BY: PC DR: PC CH: PT O.K.: PT DATE			
CENTIMETERS		FOLD		REVISIONS		FOLD		FOLD		INCHES			



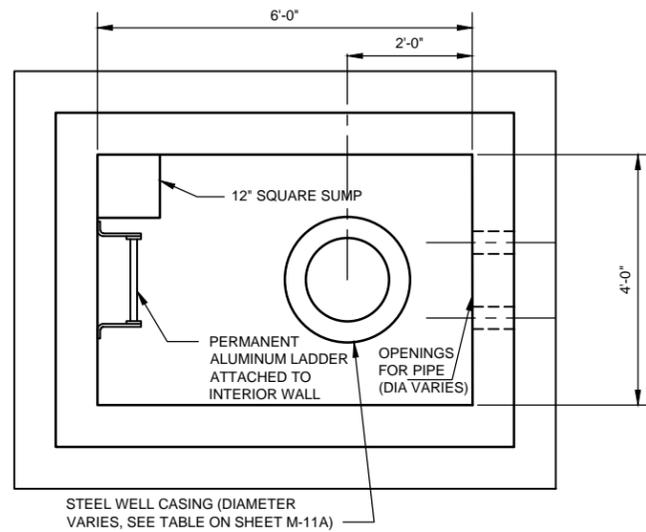
TOP PLAN

SCALE: 3/4"=1'-0"



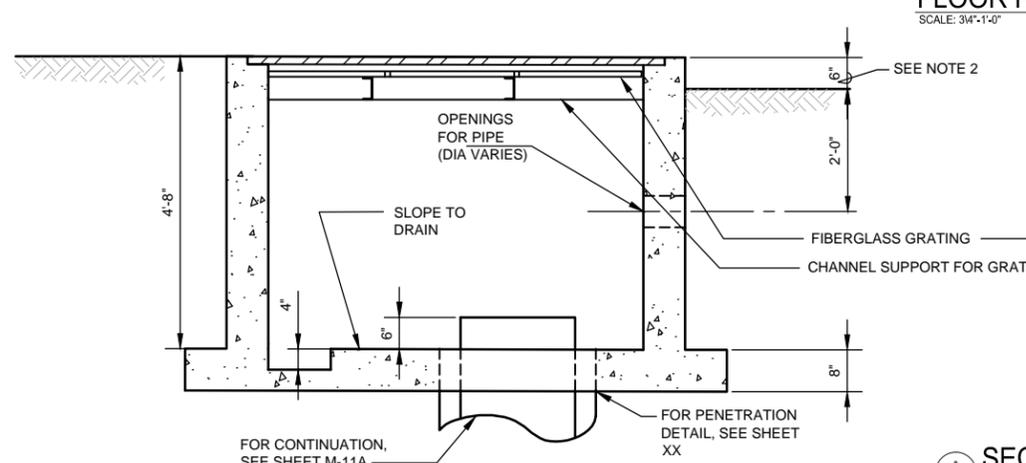
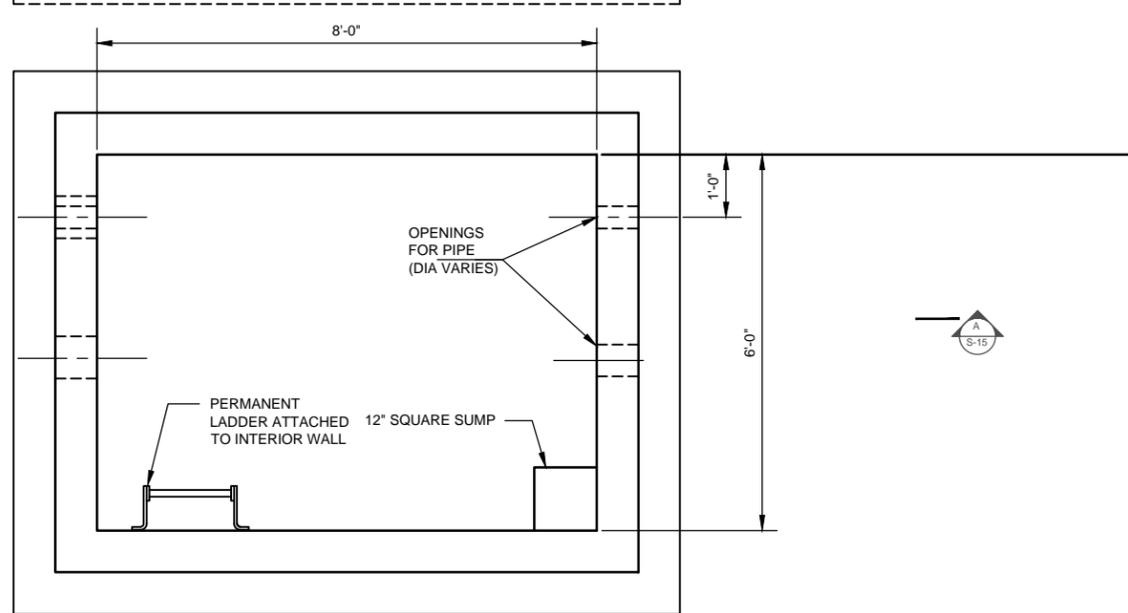
NOTES:

- 1. DIMENSIONS MAY VARY DEPENDING ON DESIGN DEVELOPMENT AND SPECIFIC CONDITIONS.
- 2. DISTANCE VARIES, SOME MAY BE FLUSH WITH THE GROUND OTHERS SET ABOVE GRADE.



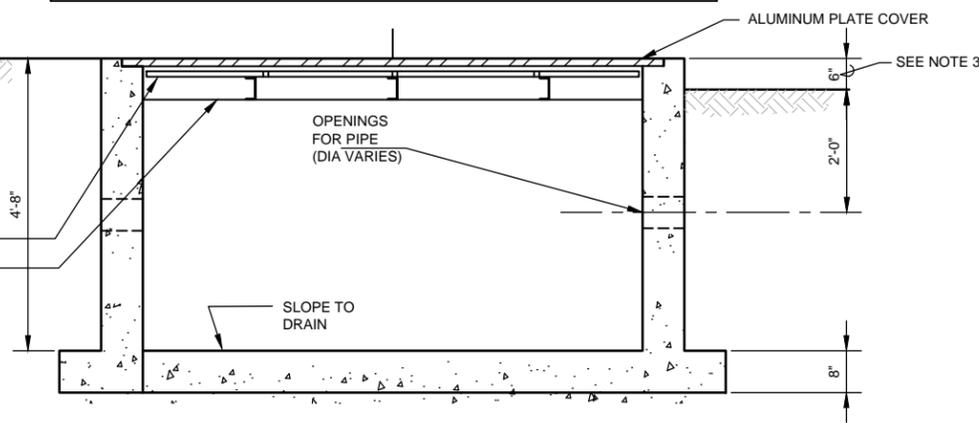
FLOOR PLAN

SCALE: 3/4"=1'-0"



SECTION A

SCALE: 3/4"=1'-0"



PIPE AND METER VAULT

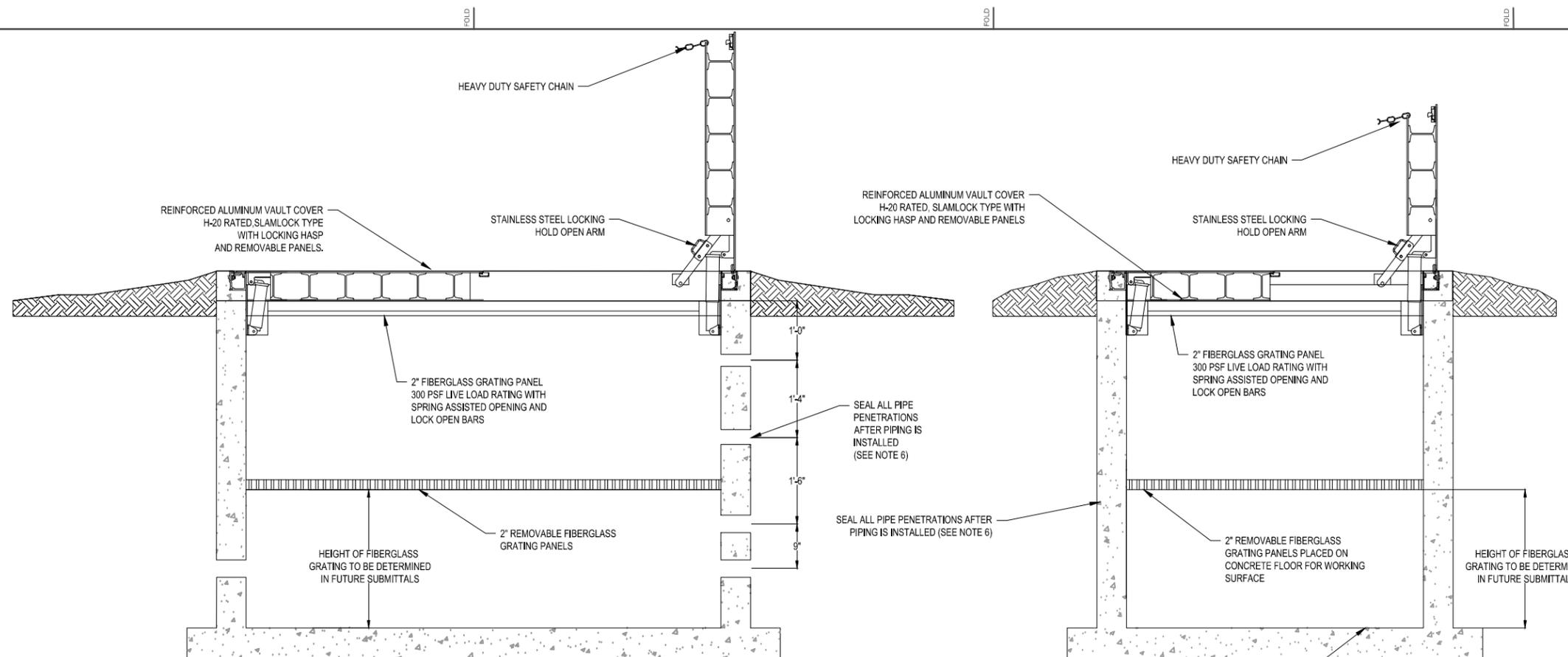


DATUM: HORIZONTAL:		PROJECTION:		NOV 2011 PRELIMINARY PLANS-NOT FOR CONSTRUCTION		APPROD BY:		AUTHORIZATION:	
VERTICAL:		UNITS:							
REFERENCE DWGS:				NO.		DATE		DESCRIPTION	
SCALES: 1 inch = 1'-4"				NO.		DATE		DESCRIPTION	
1 centimeter =				REVISIONS		APPROD. NO.		DATE	

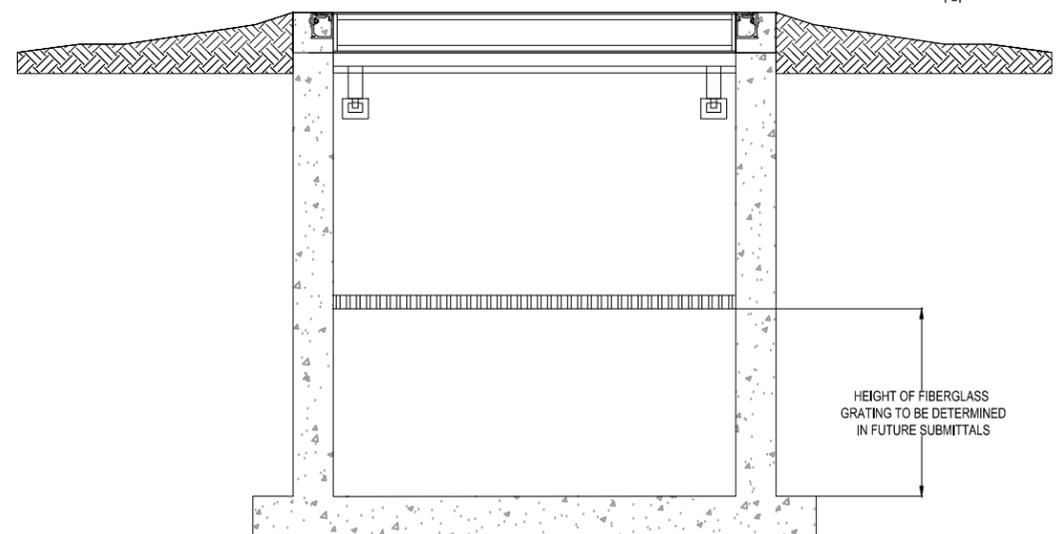
TOPOCK GROUNDWATER REMEDIATION PROJECT
INJECTION WELL AND PIPE - METER VAULT- PLAN AND SECTIONS
 PACIFIC GAS AND ELECTRIC COMPANY
 SAN FRANCISCO, CALIFORNIA

JCN _____
 AREA _____
 COUNTY _____
 PROFILE _____
 SHEET NO. _____ OF _____
S-15
 DRAWING NUMBER _____
 CHANGE _____

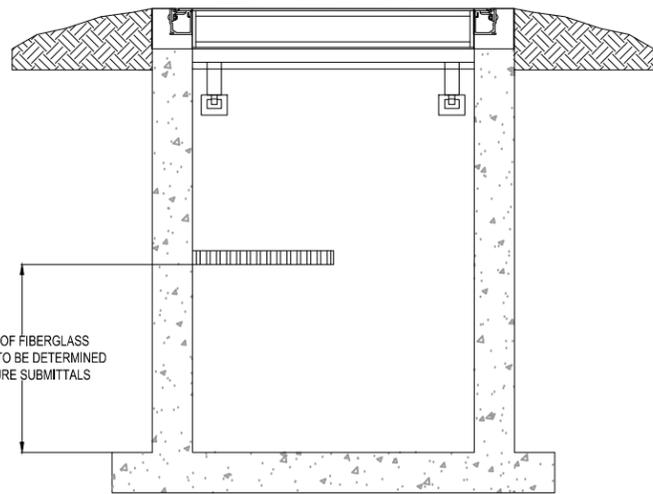
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A INJECTION VALVE VAULT AND INJECTION WELL VAULT SECTION
S-17A 1"=1'



B INJECTION VALVE VAULT SECTION
S-17A 1"=1'



C INJECTION WELL VAULT SECTION
S-17A 1"=1'

- NOTES:
1. CONCRETE VAULT DESIGNED IN ACCORDANCE WITH AASHTO H-20-44 TRAFFIC LOADING USING 5,500 P.S.I. COMPRESSIVE STRENGTH, ASTM A-706 STEEL REINFORCING.
 2. ALL PIPING AND CONDUIT SHALL BE SECURED TO THE WALLS OF THE CONCRETE WELL VAULT WITH ANCHOR BOLTS AND UNI-STRUT. SUPPORTS SHALL BE INSTALLED WHEREVER NECESSARY TO PROPERLY SUPPORT PIPING AND CONDUIT.
 3. PIPING KNOCKOUTS AND ROUTING OF PIPING SHOWN AS PROPOSED AND APPROXIMATE. ACTUAL ROUTING TO BE FIELD DETERMINED AND IS SUBJECT TO ENGINEER'S APPROVAL.
 4. CONTRACTOR RESPONSIBLE FOR LOCATING AND VERIFYING LOCATION OF ALL UTILITIES LOCATED WITHIN AREAS TO BE AFFECTED BY CONSTRUCTION.
 5. ALL PIPE PENETRATIONS SHALL BE SEALED WITH NEAT CEMENT GROUT IN ACCORDANCE WITH SPECIFICATIONS.
 6. BACKFILL INJECTION AND EXTRACTION VALVE AND WELL VAULTS TO SPECIFIED DEPTH IF VAULT EXTENDS BEYOND THE SPECIFIED DEPTH.
 7. ALL TRANSITION FITTINGS FOR HDPE PIPING SHALL BE FLANGED WITH BACKING RINGS.
 8. DIMENSIONS SHOWN ARE PRELIMINARY AND SUBJECT TO CHANGE DURING THE DETAILED ENGINEERING DESIGN.
 9. ALL VAULTS WILL INCLUDE AN INTEGRAL CONCRETE SUMP AND FLOORS SLOPED TO THE SUMP. SUMP LOCATIONS WILL BE IDENTIFIED IN A FUTURE SUBMITTAL.

DATUM: HORIZONTAL:		PROJECTION:		NOV 2011 PRELIMINARY PLANS - NOT FOR CONSTRUCTION		APPROVED BY:		AUTHORIZATION:	
VERTICAL:		UNITS:				BY: JB		DATE:	
REFERENCE DWGS:						CH: LK			
SCALES: 1 inch = 1 centimeter						O.K.: JF			
						DATE:			
REVISIONS									

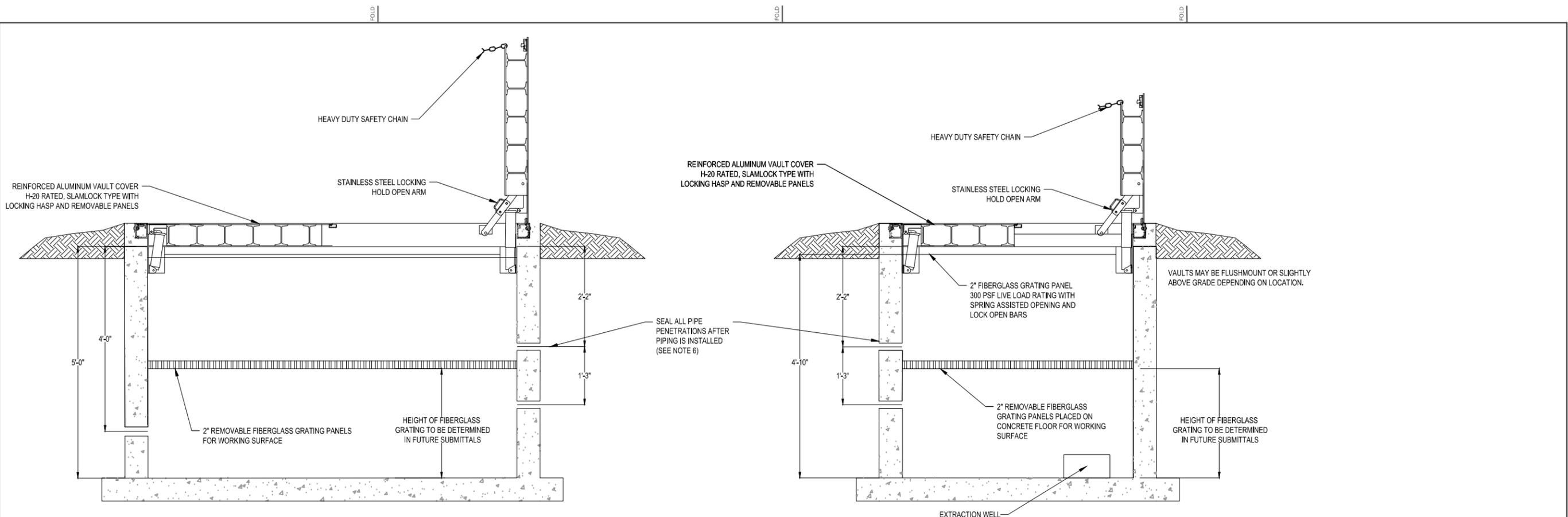
TOPOCK GROUNDWATER REMEDIATION PROJECT
STRUCTURAL SECTIONS
INJECTION WELL VAULTS
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA



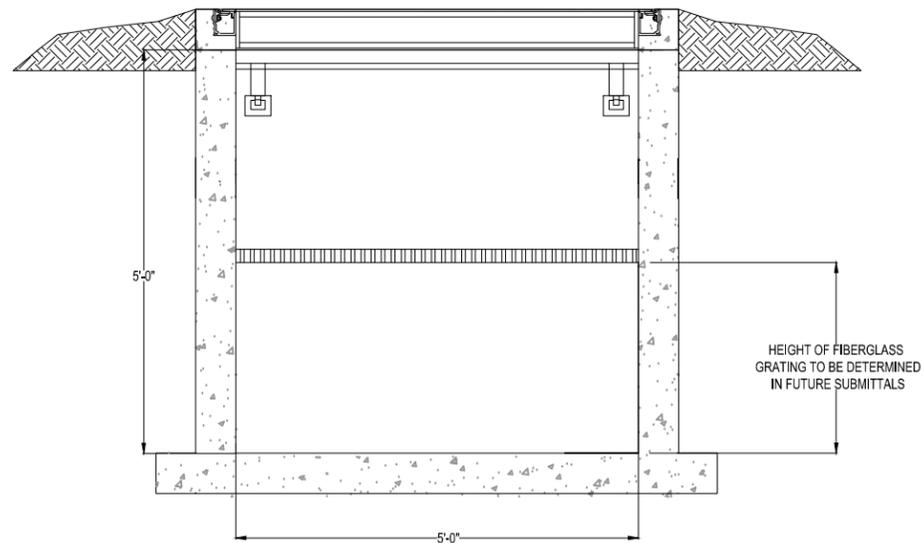
JCN	AREA	COUNTY	PROFILE
SHEET NO.	OF	DRAWING NUMBER	CHANGE
S-17B			



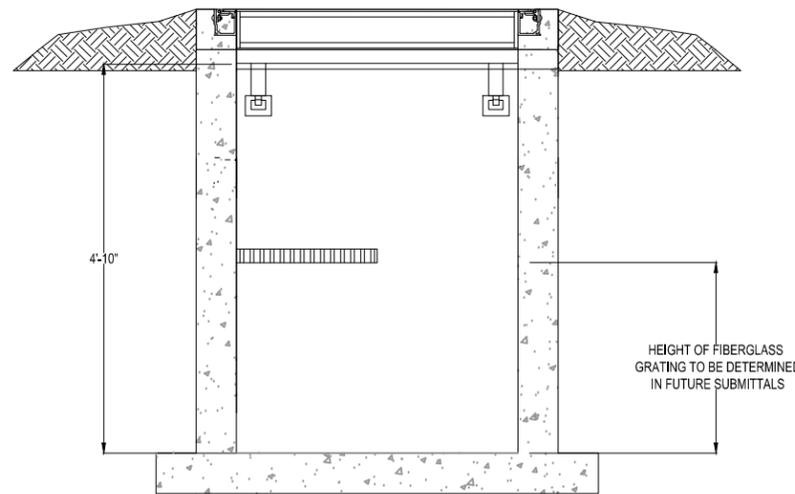
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A EXTRACTION VALVE VAULT AND WELL VAULT SECTION
S-17C
1"=1'



B EXTRACTION WELL VALVE VAULT SECTION
S-17C
1"=1'



C EXTRACTION WELL VAULT SECTION
S-17C
1"=1'

- NOTES:
1. CONCRETE VAULT DESIGNED IN ACCORDANCE WITH AASHTO H-20-44 TRAFFIC LOADING USING 5,500 P.S.I. COMPRESSIVE STRENGTH, ASTM A-706 STEEL REINFORCING.
 2. ALL PIPING AND CONDUIT SHALL BE SECURED TO THE WALLS OF THE CONCRETE WELL VAULT WITH ANCHOR BOLTS AND UNI-STRUT. SUPPORTS SHALL BE INSTALLED WHEREVER NECESSARY TO PROPERLY SUPPORT PIPING AND CONDUIT.
 3. PIPING KNOCKOUTS AND ROUTING OF PIPING SHOWN AS PROPOSED AND APPROXIMATE. ACTUAL ROUTING TO BE FIELD DETERMINED AND IS SUBJECT TO ENGINEER'S APPROVAL.
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 8. DIMENSIONS ARE PRELIMINARY AND SUBJECT TO CHANGE DURING THE DETAILED ENGINEERING DESIGN.
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DATUM: HORIZONTAL:		PROJECTION:		NOV 2011 PRELIMINARY PLANS - NOT FOR CONSTRUCTION		APPROVED BY:		AUTHORIZATION:	
VERTICAL:		UNITS:				BY: JB		DR: LK	
REFERENCE DWGS:						CH: JF		O.K.: JF	
SCALES: 1 inch = 1 centimeter				NO. DATE DESCRIPTION		APPRO. NO. DATE DESCRIPTION		DATE	
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TOPOCK GROUNDWATER REMEDIATION PROJECT
STRUCTURAL SECTIONS
EXTRACTION WELLS
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA



JCN	AREA	COUNTY	PROFILE
SHEET NO.	OF	DRAWING NUMBER	CHANGE
		S-17D	

FOLD
INCHES
5 4 3 2 1 0

PIPING SYMBOLS

	FIRE HYDRANT		SLEEVE - TYPE COUPLING
	MANHOLE		FLANGED ADAPTER COUPLING
	FLOOR DRAIN		EXPANSION JOINT
	EQUIPMENT NUMBER SEE EQUIPMENT SCHEDULE		MECHANICAL TYPE COUPLING
	BACKFLOW PREVENTER		FLANGE
	GATE VALVE, BURIED WITH VALVE BOX		FLEXIBLE COUPLING
	BUTTERFLY VALVE, BURIED WITH VALVE BOX		UNION
	ECCENTRIC PLUG VALVE, BURIED WITH VALVE BOX		CAPPED END OR PLUGGED END
	LUBRICATED PLUG VALVE, BURIED WITH VALVE BOX		BLIND FLANGE
	GATE VALVE		REDUCER OR INCREASER
	BALL VALVE		ORIFICE PLATE AND FLANGES
	BUTTERFLY VALVE		CUT PIPE
	ECCENTRIC PLUG VALVE		STRAINER
	LUBRICATED PLUG VALVE		DRAIN
	GLOBE VALVE		FLOW TUBE
	DIAPHRAGM VALVE		MAGNETIC METER
	CHECK VALVE		DENSITY METER
	PRESSURE REGULATING VALVE		PROPELLER METER
	BACK-PRESSURE VALVE		ULTRASONIC METER
	ELECTRIC MOTOR		TUBE METER
	MOTOR OPERATOR FOR VALVES (M=ELECTRIC, P=PNEUMATIC)		CONDENSATE TRAP
	TEMPERATURE CONTROL VALVE		PIPE SUPPORT (IN PLAN ONLY)
	SOLENOID VALVE		CATCH BASIN
	MULTIPOINT VALVE - 3 VALVE		PULSATION DAMPENNER
	MULTIPOINT VALVE - 4 VALVE		WORKPOINT CALLOUT FOR PIPING OR STRUCTURE
	FLOAT OPERATED VALVE		SOIL BORING & IDENTIFICATION NUMBER
	NEEDLE VALVE		CHANGE IN PIPE MATERIAL
	PRESSURE RELIEF VALVE		
	ANGLE VALVE		
	HOSE BIB (H/B)		
	HORIZONTAL CENTRIFUGAL OR TURBINE PUMP		
	VERTICAL PUMP		
	METERING PUMP		
	INJECTOR OR EDUCTOR		
	AIR RELEASE		
	FLANGED FITTING		
	WELDED FITTING		
	MECHANICAL- TYPE FITTING (GROOVED)		
	SCREWED, SOCKET-WELD, BELL AND SPIGOT OR HUBLESS FITTING		

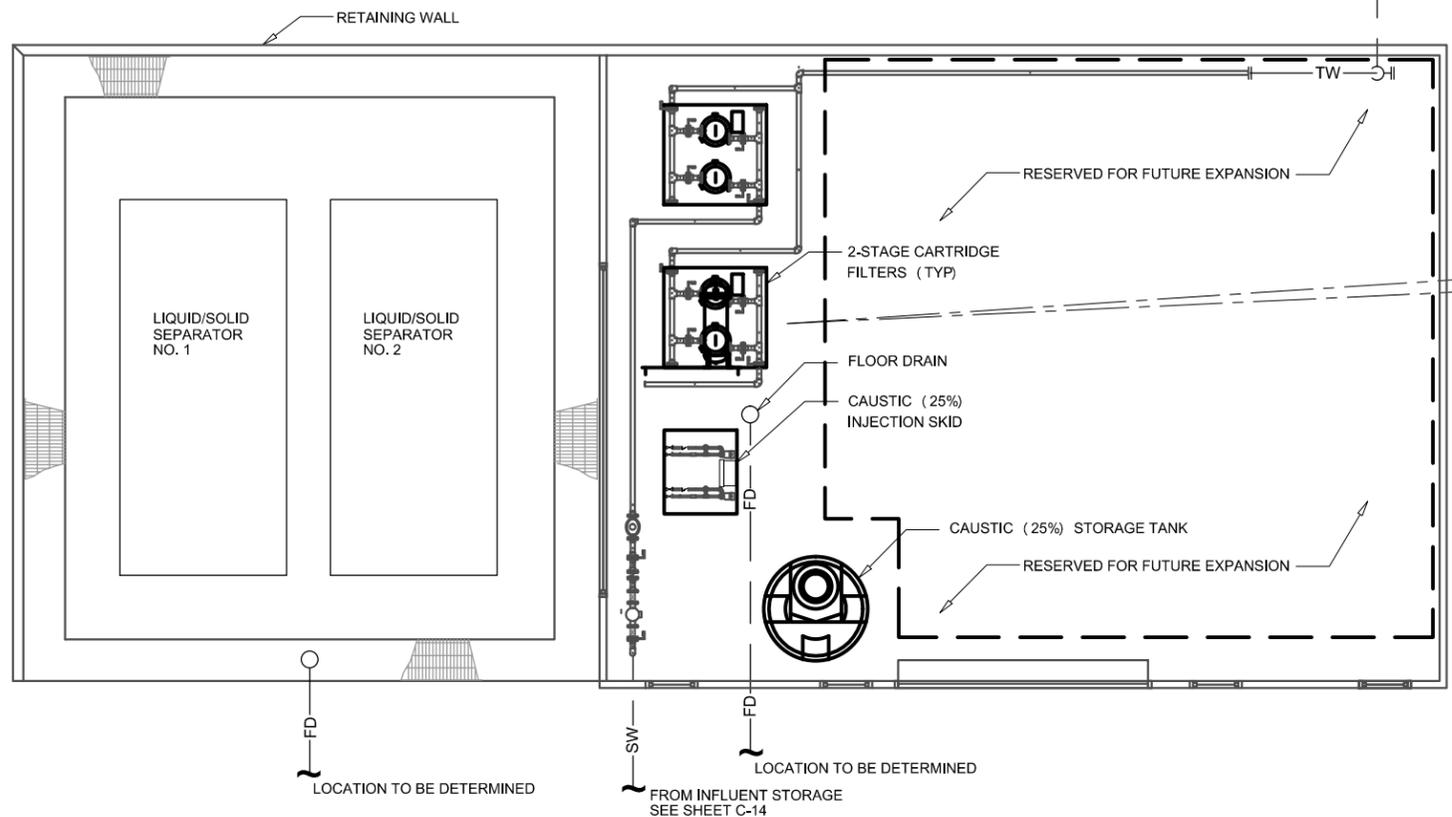
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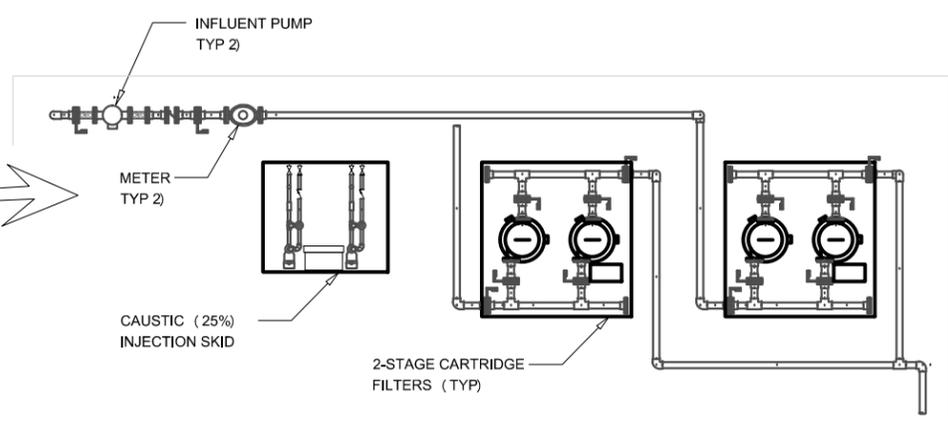
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REFERENCE DWGS: _____				REVISIONS										BY: PC DR: PC O.K.: PT DATE: PT		PACIFIC GAS AND ELECTRIC COMPANY SAN FRANCISCO, CALIFORNIA		SHEET NO. _____ OF _____ DRAWING NUMBER _____ CHANGE _____ M-1	
SCALES: 1 inch = _____ 1 centimeter = _____				_____										_____		_____		_____	

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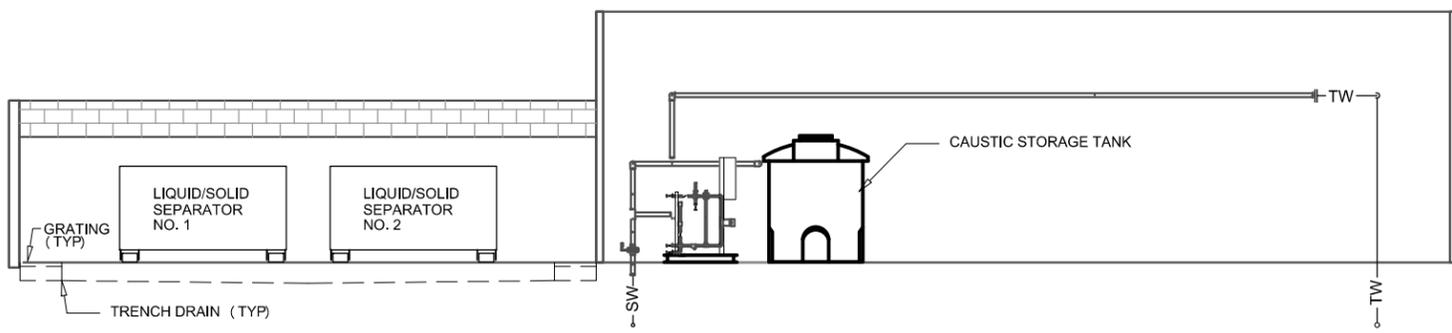
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INCHES



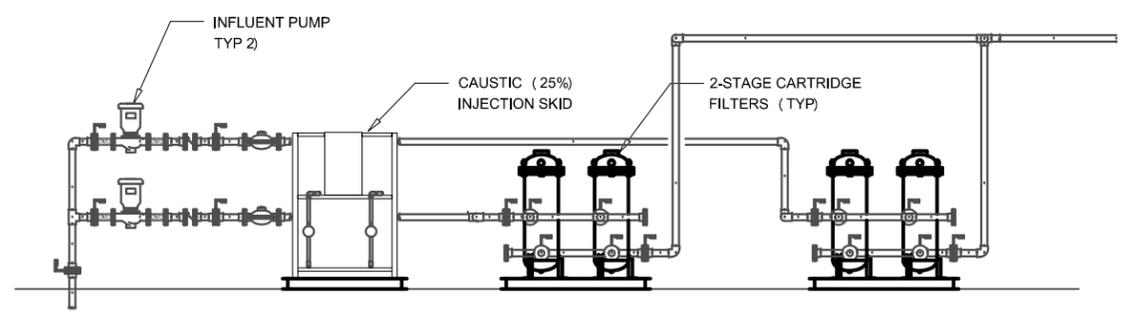
PLAN



ENLARGED PLAN



SECTION



ELEVATION

DATUM: HORIZONTAL:		PROJECTION:		NOV 2011 PRELIMINARY PLANS-NOT FOR CONSTRUCTION		APPRD BY:		AUTHORIZATION:	
VERTICAL:		UNITS:							
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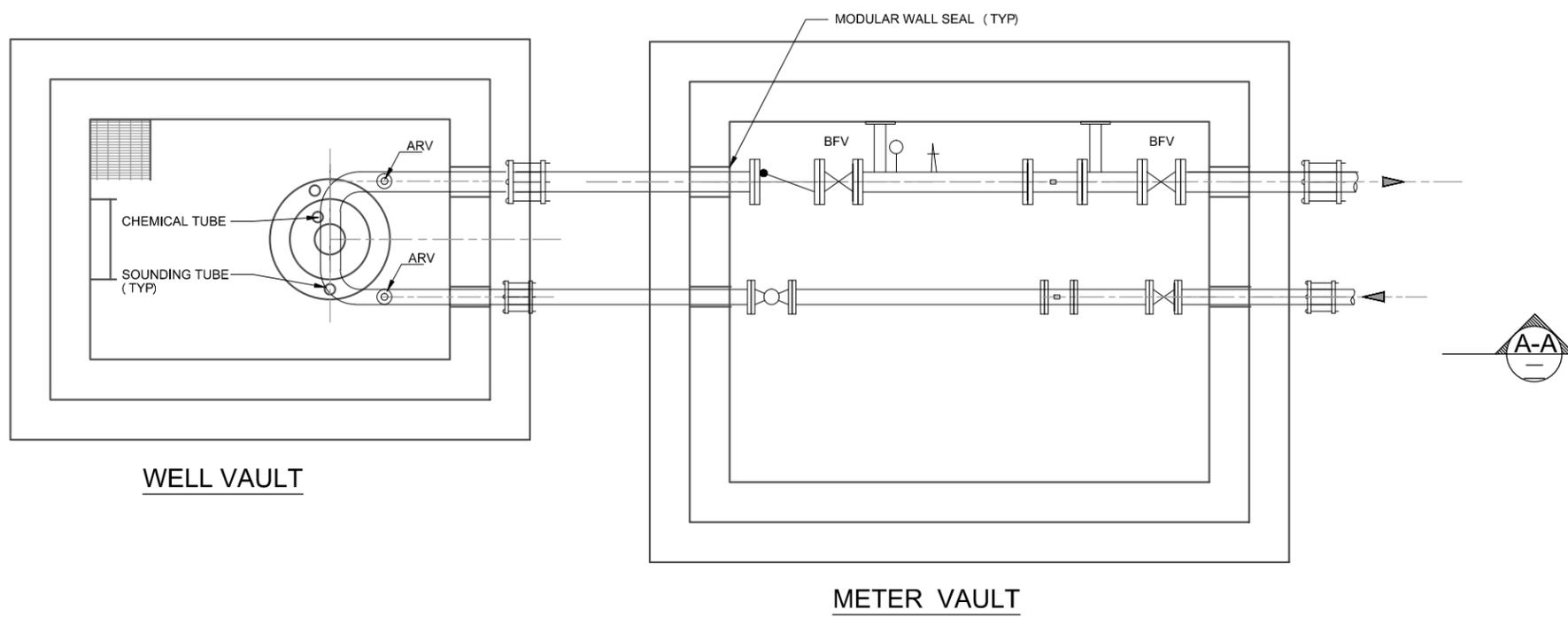
TOPOCK GROUNDWATER REMEDIATION PROJECT
 REMEDY- PRODUCED WATER CONDITIONING PLANT
 PLAN AND SECTIONS
 PACIFIC GAS AND ELECTRIC COMPANY
 SAN FRANCISCO, CALIFORNIA



JCN	AREA	COUNTY	PROFILE
SHEET NO.	OF	DRAWING NUMBER	CHANGE
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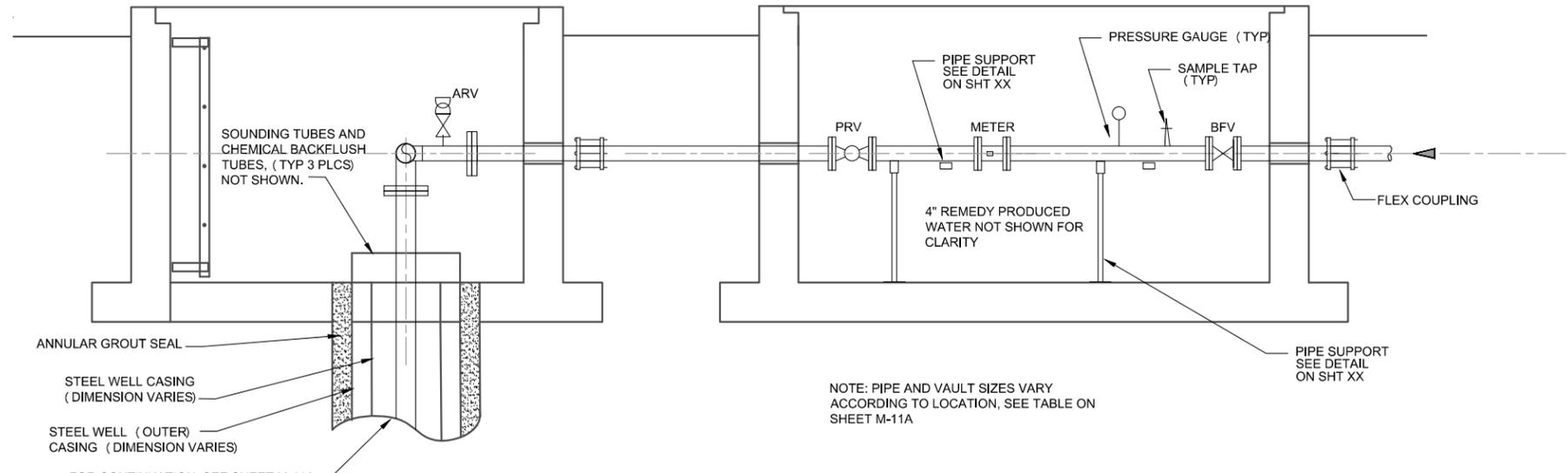
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CENTIMETERS

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INCHES



WELL VAULT

METER VAULT



SECTION A-A

NOTE: PIPE AND VAULT SIZES VARY ACCORDING TO LOCATION, SEE TABLE ON SHEET M-11A

DATUM: HORIZONTAL:		PROJECTION:		NOV 2011 PRELIMINARY PLANS - NOT FOR CONSTRUCTION		APPRD BY:		AUTHORIZATION	
VERTICAL:		UNITS:							
REFERENCE DWGS:									
SCALES: 1 inch =		NO.		DATE		DESCRIPTION		APPRD.	
1 centimeter =		REVISIONS							

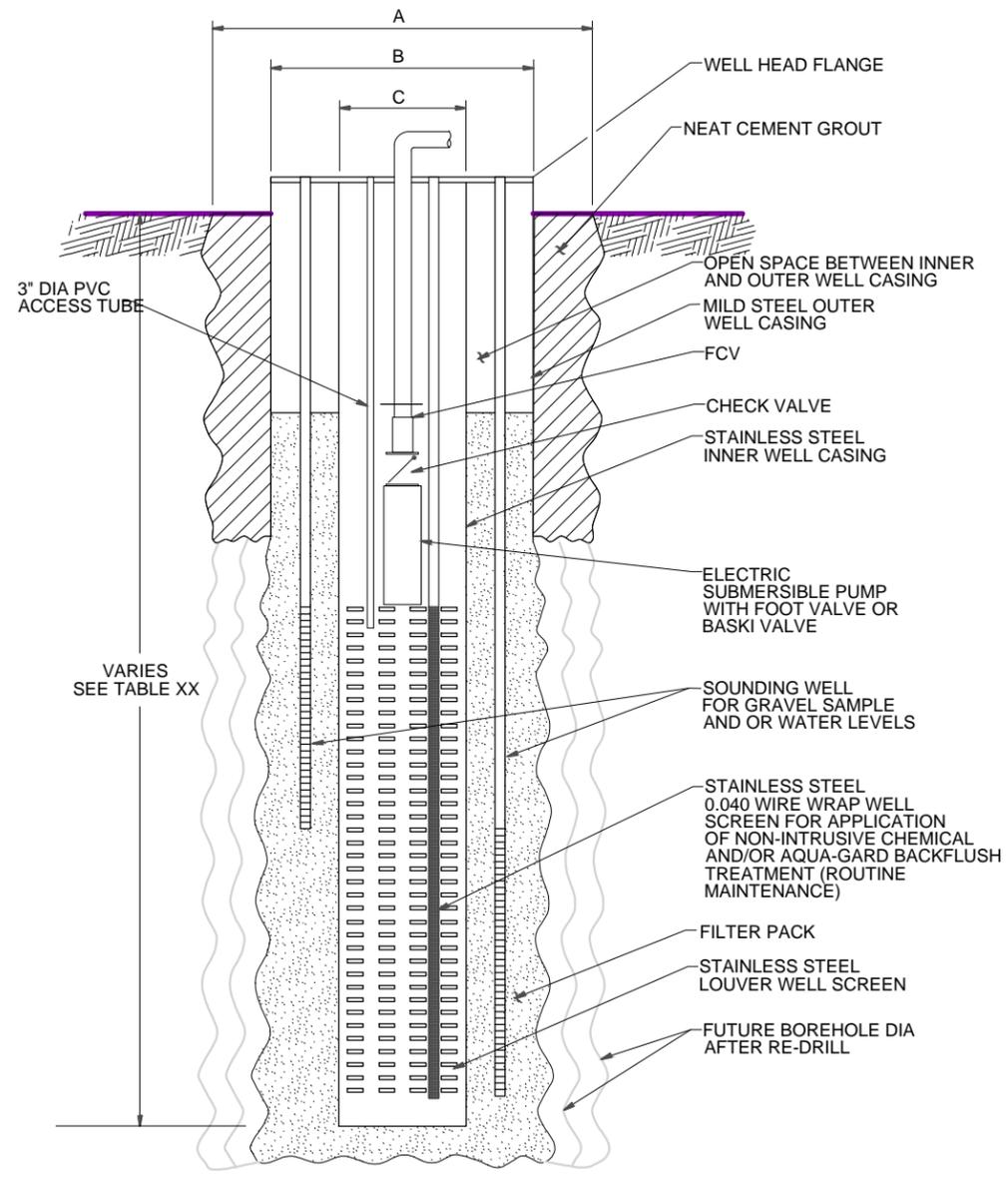
TOPOCK GROUNDWATER REMEDIATION PROJECT
 FRESHWATER INJECTION WELL AND METER VAULT - PLAN AND SECTIONS
 PACIFIC GAS AND ELECTRIC COMPANY
 SAN FRANCISCO, CALIFORNIA



JCN	AREA	COUNTY	PROFILE
SHEET NO.	OF	DRAWING NUMBER	CHANGE
		M-11	

CENTIMETERS

INCHES



Well ID	Depth of Conductor Casing (ft)	Diameter of Conductor Borehole (inches)	Depth of Borehole (ft)	Borehole Diameter (inches)	Well Depth (ft)	Well Casing Diameter (inches)
FW-INJ-1	50	24	370	22	350	14
FW-INJ-2	50	24	420	22	400	14
FW-INJ-4	50	24	120	22	100	14
UPGRAD-INJ-1	50	24	360	22	350	14
UPGRAD-INJ-2	50	24	410	22	400	14
UPGRAD-INJ-3	50	24	410	22	400	14
UPGRAD-INJ-4	50	24	410	22	400	14

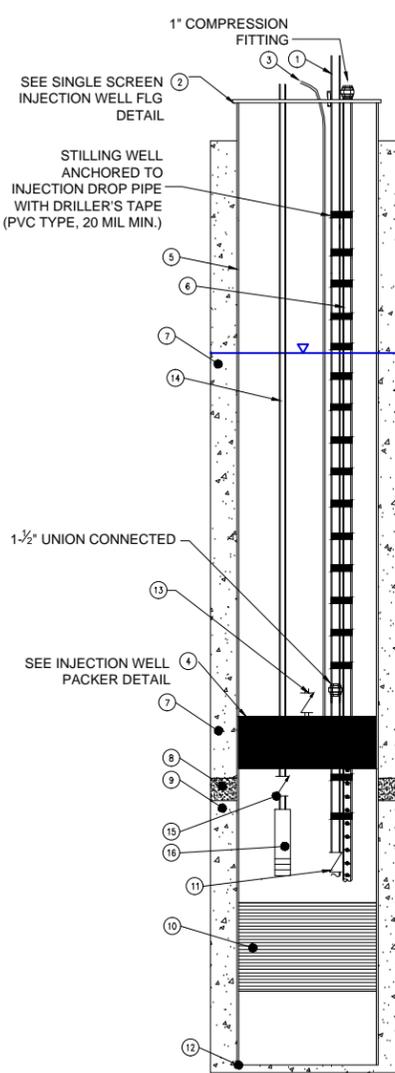
NOTE: WELL DEPTH AND WELL CASING DIMENSIONS (A, B & C) SHOWN IN TABLE ON THIS SHEET

FRESH WATER INJECTION WELL DESIGN

NOT TO SCALE

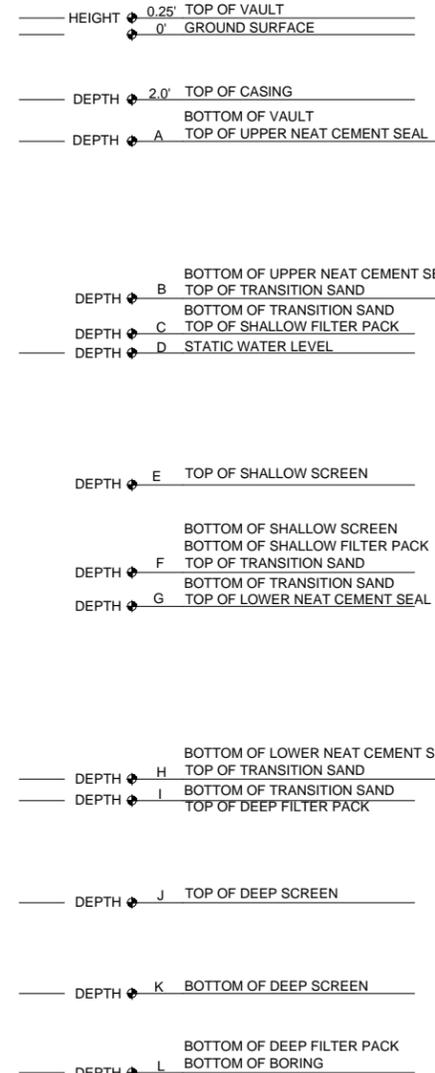
DATUM: HORIZONTAL: _____		PROJECTION: _____		NOV 2011 PRELIMINARY PLANS-NOT FOR CONSTRUCTION		APPRD BY: _____		AUTHORIZATION: _____		TOPOCK GROUNDWATER REMEDIATION PROJECT FRESHWATER INJECTION WELL CONSTRUCTION DETAILS PACIFIC GAS AND ELECTRIC COMPANY SAN FRANCISCO, CALIFORNIA		JCN: _____ AREA: _____ COUNTY: _____ PROFILE: _____	
VERTICAL: _____		UNITS: _____										SHEET NO. _____ OF _____ DRAWING NUMBER: M-11A CHANGE: _____	
REFERENCE DWGS: _____													
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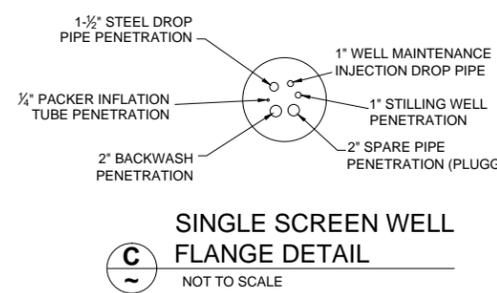
SINGLE SCREEN INJECTION WELL WITH BACKWASH PUMP DETAIL

NOT TO SCALE. PACKER GRAPHIC POSITION MAY NOT ACCURATELY REPRESENT POSITION. SEE WELL CONSTRUCTION SCHEDULE SHEET M-13B FOR REPRESENTATIVE DEPTHS. WELL DIAMETER EXAGGERATED TO SHOW DETAIL.



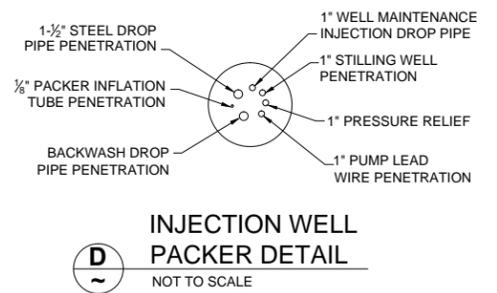
DUAL SCREEN INJECTION WELL WITH BACKWASH PUMPS DETAIL

NOT TO SCALE. PACKER GRAPHIC POSITION MAY NOT ACCURATELY REPRESENT POSITION. SEE WELL CONSTRUCTION SCHEDULE SHEET M-13B FOR REPRESENTATIVE DEPTHS. WELL DIAMETER EXAGGERATED TO SHOW DETAIL.



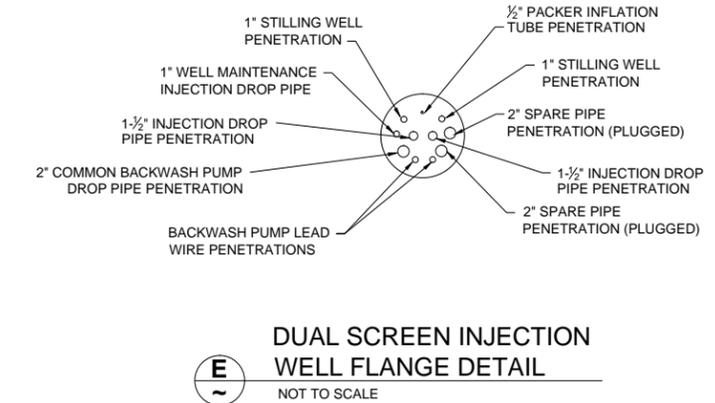
SINGLE SCREEN WELL FLANGE DETAIL

NOT TO SCALE



INJECTION WELL PACKER DETAIL

NOT TO SCALE



DUAL SCREEN INJECTION WELL FLANGE DETAIL

NOT TO SCALE

KEY

1	DROP PIPE (MATERIALS TBD)
2	CUSTOM STEEL WELL SEAL
3	1/4" DIAMETER HOSE FROM PACKER TO FILL ASSEMBLY
4	PNEUMATIC WELL PACKER
5	WELL CASING (MATERIALS TBD)
6	1" HDPE TUBING (STILLING WELL WITH PRESSURE TRANSDUCER)
7	ANNULAR SPACE, 100% NEAT CEMENT GROUT
8	ANNULAR SPACE, TRANSITION SAND (SIZE TBD)
9	ANNULAR SPACE, FILTER PACK (TYPE TBD)
10	WELL SCREEN (MATERIALS TBD)
11	SPRING CHECK VALVE (TYPE AND MATERIALS TBD)
12	SUMP
13	PACKER PRESSURE RELIEF SAFETY VALVE
14	BACKWASH PIPING
15	BACKWASH PUMP CHECK VALVE
16	BACKWASH PUMP

- NOTES:**
- ALL DEPTH INTERVALS 'A' THRU 'K' ARE IN FEET BELOW GROUND SURFACE.
 - ALL COORDINATES BASED ON NAD83, CA ZONE V.
 - ALL WELL SEALS ARE 100% NEAT CEMENT.
 - ALL ABOVE-GRADE PIPING AND INSTRUMENTATION INSTALLED IN ACCORDANCE WITH THE P&ID AND THE WELLHEAD MECHANICAL LAYOUT

DATUM: HORIZONTAL:	PROJECTION:	NOV 2011 PRELIMINARY PLANS - NOT FOR CONSTRUCTION	APPR BY:	AUTHORIZATION:
VERTICAL:	UNITS:		BY: JB	
REFERENCE DWGS:			DR: CK	
			CH: JF	
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			DATE:	

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REVISIONS								

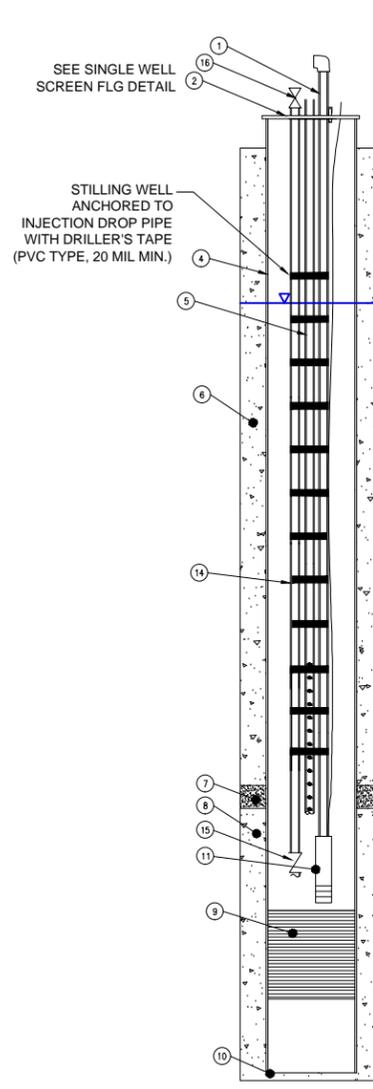
TOPOCK GROUNDWATER REMEDIATION PROJECT
INJECTION WELL CONSTRUCTION DETAILS

PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

JCN _____
AREA _____
COUNTY _____
PROFILE _____

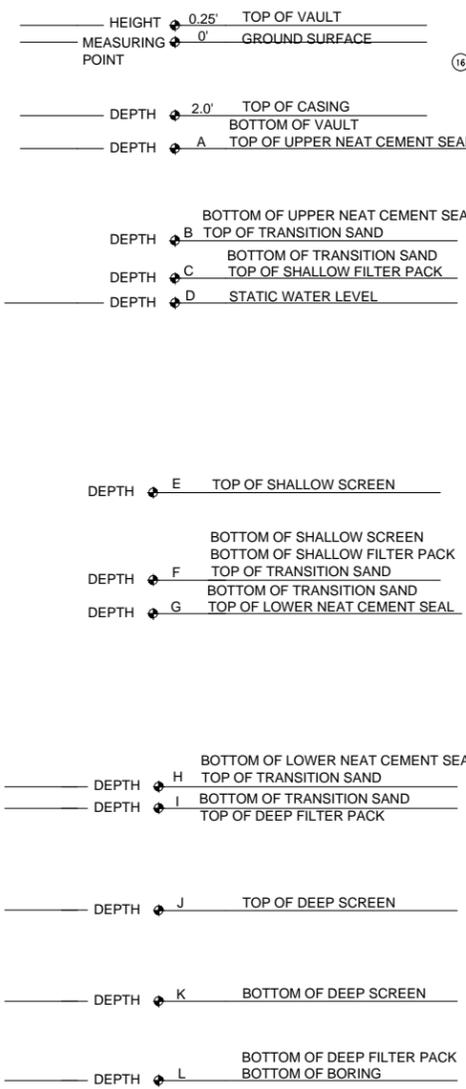
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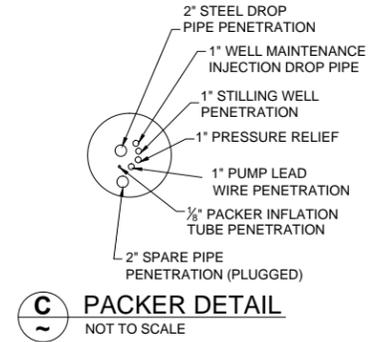
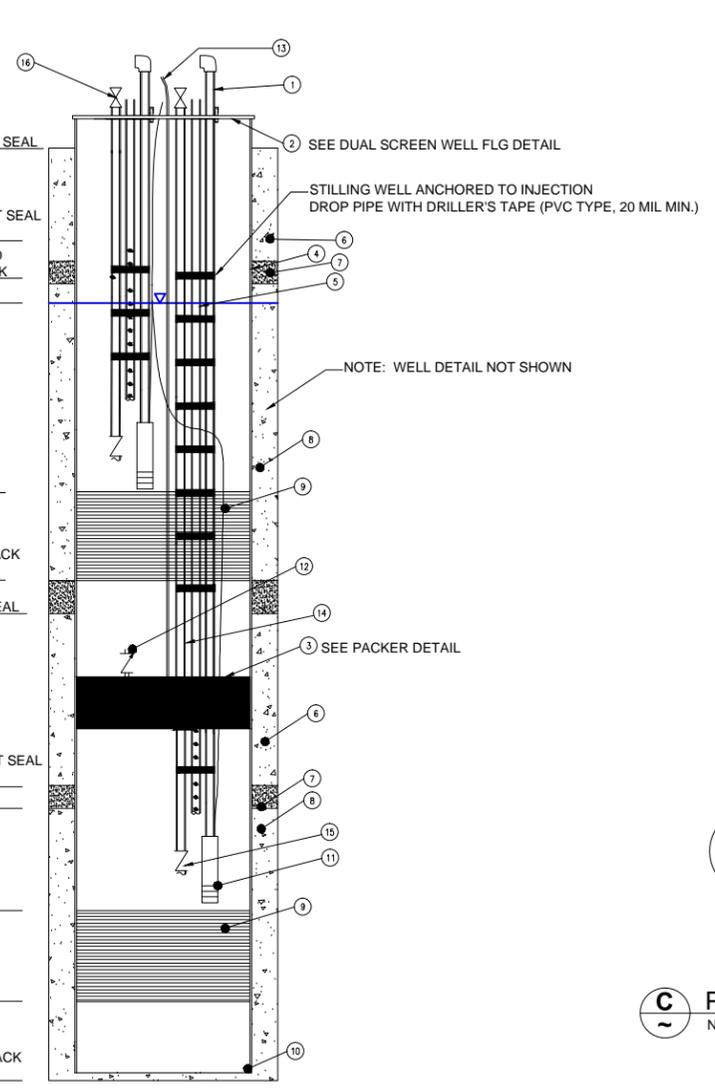
A SINGLE SCREEN EXTRACTION WELL DETAIL

NOT TO SCALE. PACKER GRAPHIC POSITION MAY NOT ACCURATELY REPRESENT POSITION. SEE WELL CONSTRUCTION SCHEDULE SHEET M-13D FOR REPRESENTATIVE DEPTHS. WELL DIAMETER EXAGGERATED TO SHOW DETAIL.

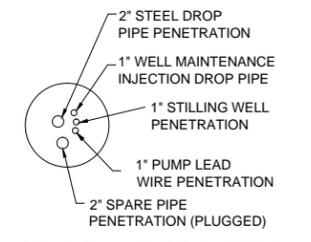


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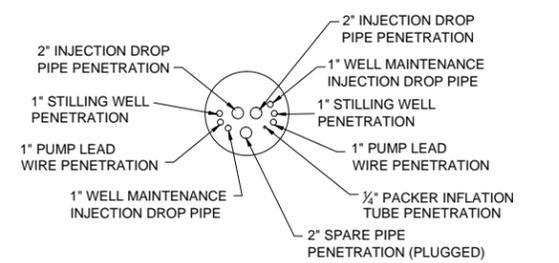
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C PACKER DETAIL
NOT TO SCALE



D SINGLE SCREEN WELL FLANGE DETAIL
NOT TO SCALE



E DUAL SCREEN WELL FLANGE DETAIL
NOT TO SCALE

KEY

1	DROP PIPE (MATERIALS TBD)
2	CUSTOM STEEL WELL SEAL
3	PNEUMATIC WELL PACKER
4	WELL CASING (MATERIALS TBD)
5	1" HDPE TUBING (STILLING WELL WITH PRESSURE TRANSDUCER)
6	ANNULAR SPACE, 100% NEAT CEMENT GROUT
7	ANNULAR SPACE, TRANSITION SAND (SIZE TBD)
8	ANNULAR SPACE, FILTER PACK (SIZE TBD)
9	WELL SCREEN (MATERIALS & TYPE TBD)
10	SUMP
11	GROUNDWATER EXTRACTION PUMP
12	PACKER PRESSURE RELIEF SAFETY VALVE
13	3/4" DIAMETER HOSE FROM PACKER TO FILL ASSEMBLY
14	1" HDPE MAINTENANCE INJECTION DROP PIPE WITH CHECK VALVE
15	SPRING CHECK VALVE WITH TBD CRACKING PRESSURE
16	1" WELL MAINTENANCE ISOLATION BALL VALVE

NOTES:

- ALL DEPTH INTERVALS 'A' THRU 'K' ARE IN FEET BELOW GROUND SURFACE.
- ALL COORDINATES BASED ON NAD83, CA ZONE V.
- ALL WELL SEALS ARE 100% NEAT CEMENT.
- ALL ABOVE-GRADE PIPING AND INSTRUMENTATION INSTALLED IN ACCORDANCE WITH THE P&ID AND THE WELLHEAD MECHANICAL LAYOUT

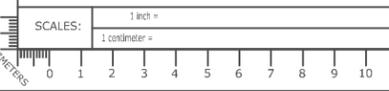
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VERTICAL:	UNITS:		BY: JB	
REFERENCE DWGS:			DR: CK	
			CH: JF	
			O.K.: JF	
			DATE:	

TOPOCK GROUNDWATER REMEDIATION PROJECT
EXTRACTION WELL CONSTRUCTION DETAILS

PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA



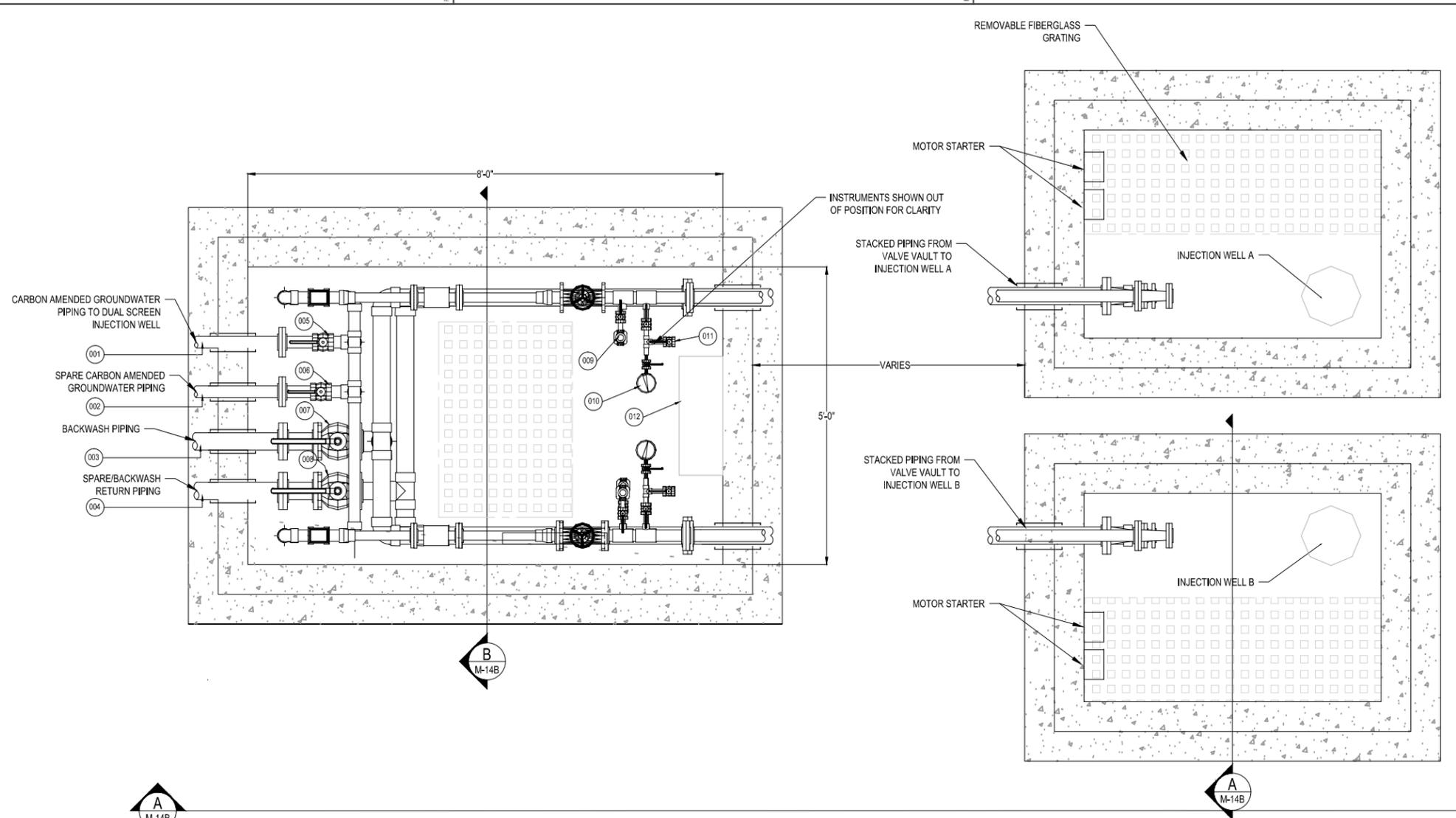
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SHEET NO. _____	OF _____	DRAWING NUMBER	CHANGE
M-13C			



NO.	DATE	DESCRIPTION	APPR. NO.	DATE	DESCRIPTION	APPR. NO.	DATE	DESCRIPTION
REVISIONS								

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INJECTION VALVE VAULT AND INJECTION WELL VAULT PLAN
 0 1 2 3
 1"=1'

- NOTES:
1. ALL PIPING, INSTRUMENTATION, AND OTHER COMPONENTS SHALL BE INSTALLED AS PER THE MANUFACTURER'S GUIDELINES.
 2. ALL PIPING AND INSTRUMENTATION SHALL BE INSTALLED PER P&IDS.
 3. INSTALLATION OF ELECTRIC COMPONENTS SHALL COMPLY WITH ALL APPLICABLE NEC AND LOCAL CODES.
 4. CROSS SECTIONS SHOW ONLY THOSE COMPONENTS NECESSARY TO INDICATE ELEVATIONS AND SPACE REQUIREMENTS FOR PIPING AND MAJOR COMPONENTS. INSTALL PIPING AND INSTRUMENTATION AS PER THE P&IDS.
 5. ALL INSTRUMENTATION SHALL BE INSTALLED SUCH THAT IT MAY BE READ WITHOUT ENTERING THE WELL VAULT.
 6. ALL VALVE HANDLES SHALL BE INSTALLED SUCH THAT THEY ARE ACCESSIBLE WITHOUT ENTERING THE WELL VAULT AND OPERABLE THROUGH ENTIRE STROKE.
 7. ALL PIPING AND CONDUIT SHALL BE SECURED TO THE WALLS OF THE CONCRETE WELL VAULT WITH ANCHOR BOLTS AND UNI-STRUT. SUPPORTS SHALL BE INSTALLED WHEREVER NECESSARY TO PROPERLY SUPPORT PIPING AND CONDUIT.
 8. PIPE SIZES AND MATERIALS ARE SHOWN ON THE P&IDS.
 9. PIPING KNOCKOUTS AND ROUTING OF PIPING SHOWN AS PROPOSED AND APPROXIMATE. ACTUAL ROUTING TO BE FIELD DETERMINED AND IS SUBJECT TO ENGINEER'S APPROVAL.
 10. ALL FLANGES SHALL BE CLASS 150 RAISED FACE FLANGES UNLESS OTHERWISE NOTED.
 11. ALL TRANSITION FITTINGS FOR HDPE PIPING SHALL BE FLANGED WITH BACKING RINGS.
 12. ALL VAULTS WILL INCLUDE AN INTEGRAL CONCRETE SUMP AND FLOORS SLOPED TO THE SUMP. SUMP LOCATIONS WILL BE IDENTIFIED IN A FUTURE SUBMITTAL.

WELL VAULT SCHEDULE				
ITEM	PIPE SIZE	PIPE MAT.	PROCESS FLOW	DESCRIPTION
1	0'-2"	HDPE	CARBON AMENDED GROUNDWATER	
2	0'-2"	HDPE	CARBON AMENDED GROUNDWATER	
3	0'-3"	HDPE	BACKWASH	
4	0'-3"	HDPE	SPARE/BACKWASH RETURN	
5	0'-2"	CPVC	CARBON AMENDED GROUNDWATER	ISOLATION BALL VALVE - EQUIPPED WITH STEM EXTENSION TO ALLOW FOR OPERATION FROM OUTSIDE OF VAULT
6	0'-2"	CPVC	CARBON AMENDED GROUNDWATER	ISOLATION BALL VALVE - EQUIPPED WITH STEM EXTENSION TO ALLOW FOR OPERATION FROM OUTSIDE OF VAULT
7	0'-3"	CPVC	BACKWASH	ISOLATION BALL VALVE - EQUIPPED WITH STEM EXTENSION TO ALLOW FOR OPERATION FROM OUTSIDE OF VAULT
8	0'-3"	CPVC	SPARE/BACKWASH RETURN	ISOLATION BALL VALVE - EQUIPPED WITH STEM EXTENSION TO ALLOW FOR OPERATION FROM OUTSIDE OF VAULT
9	0'-0 1/2"	TBD	CARBON AMENDED GROUNDWATER	AIR/VAC RELEASE ASSEMBLY
10	0'-0 1/2"	TBD	CARBON AMENDED GROUNDWATER	PRESSURE GAUGE ASSEMBLY
11	0'-0 1/4"	TBD	CARBON AMENDED GROUNDWATER	SAMPLE PORT
12	N/A	N/A	N/A	CONTROL/COMM. PANEL
13	0'-1 1/2"	CPVC	CARBON AMENDED GROUNDWATER	DIAPHRAGM VALVE
14	0'-1"	TEFLON	CARBON AMENDED GROUNDWATER	MAGNETIC FLOWMETER
15	0'-1 1/2"	CPVC	CARBON AMENDED GROUNDWATER	PROPORTIONAL ACTUATED BALL VALVE

DATUM: HORIZONTAL:	PROJECTION:	NOV 2011 PRELIMINARY PLANS - NOT FOR CONSTRUCTION	APPROVED BY:	AUTHORIZATION:
VERTICAL:	UNITS:		BY: JB	
REFERENCE DWGS:			DR: LK	
			CH: JF	
			O.K.: JF	
			DATE:	

NO.	DATE	DESCRIPTION	APPRO. NO.	DATE	DESCRIPTION	APPRO. NO.	DATE	DESCRIPTION
REVISIONS								

TOPOCK GROUNDWATER REMEDIATION PROJECT
 MECHANICAL DETAILS
 INJECTION WELL VAULTS
 PACIFIC GAS AND ELECTRIC COMPANY
 SAN FRANCISCO, CALIFORNIA

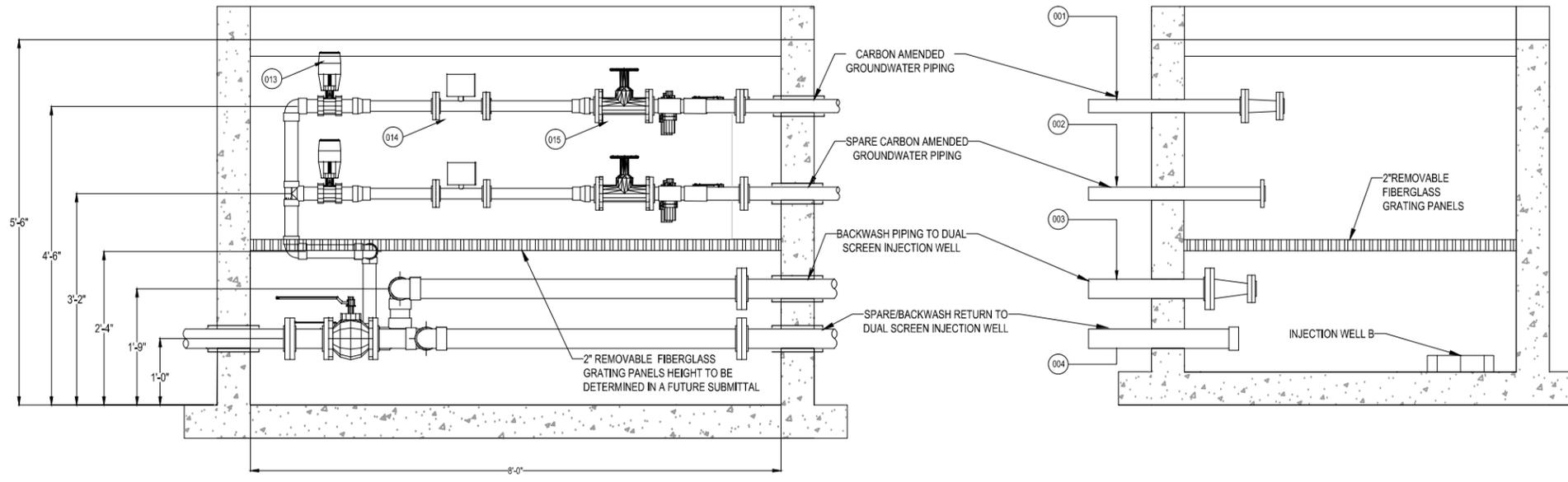


JCN	AREA	COUNTY	PROFILE
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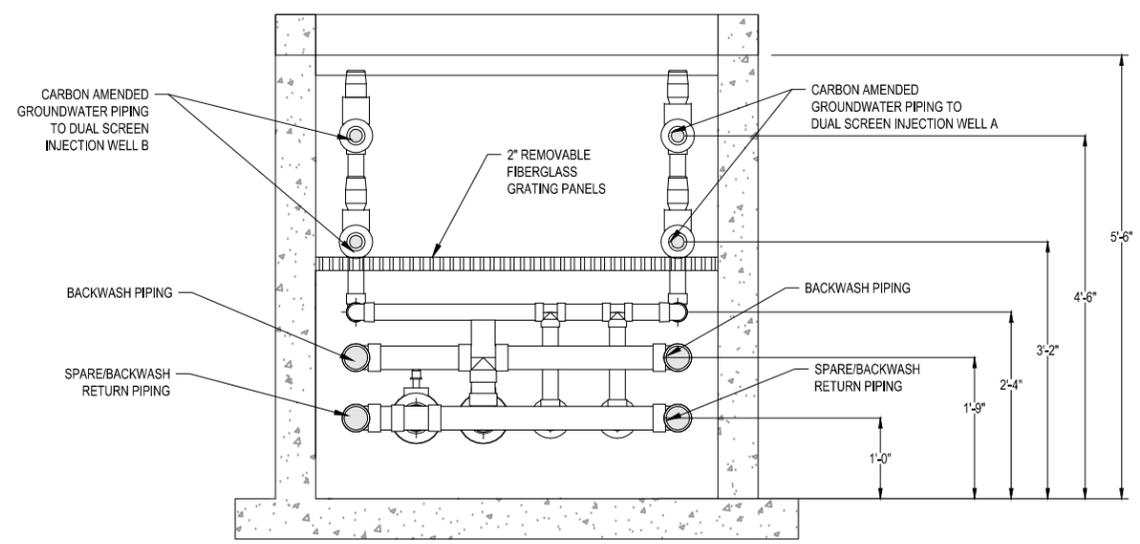
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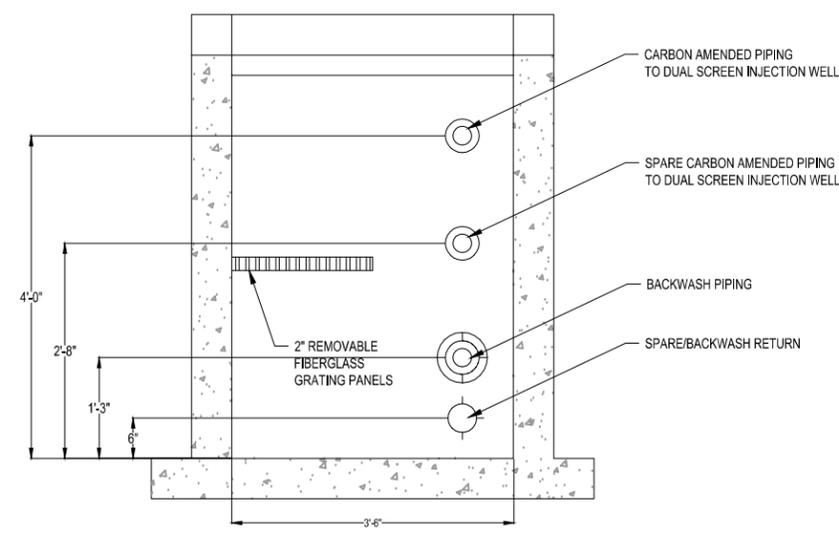
A INJECTION VALVE VAULT AND INJECTION WELL VAULT SECTION
M-14A
1"=1'

WELL VAULT SCHEDULE				
ITEM	PIPE SIZE	PIPE MAT.	PROCESS FLOW	DESCRIPTION
1	0'-2"	HDPE	CARBON AMENDED GROUNDWATER	
2	0'-2"	HDPE	CARBON AMENDED GROUNDWATER	
3	0'-3"	HDPE	BACKWASH	
4	0'-3"	HDPE	SPARE/BACKWASH RETURN	

- NOTES:
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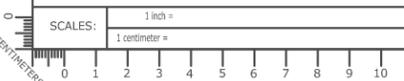


B INJECTION VALVE VAULT SECTION
M-14A
1"=1'



C INJECTION WELL VAULT SECTION
M-14A
1"=1'

DATUM: HORIZONTAL:	PROJECTION:	NOV 2011	PRELIMINARY PLANS - NOT FOR CONSTRUCTION	APPR BY:	AUTHORIZATION:
VERTICAL:	UNITS:			BY: JB	
REFERENCE DWGS:				DR: LK	
				CH: JF	
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				DATE:	



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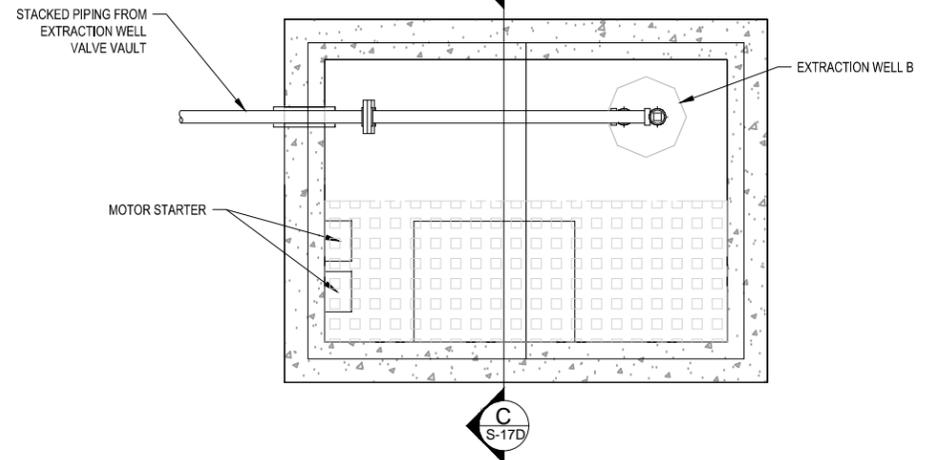
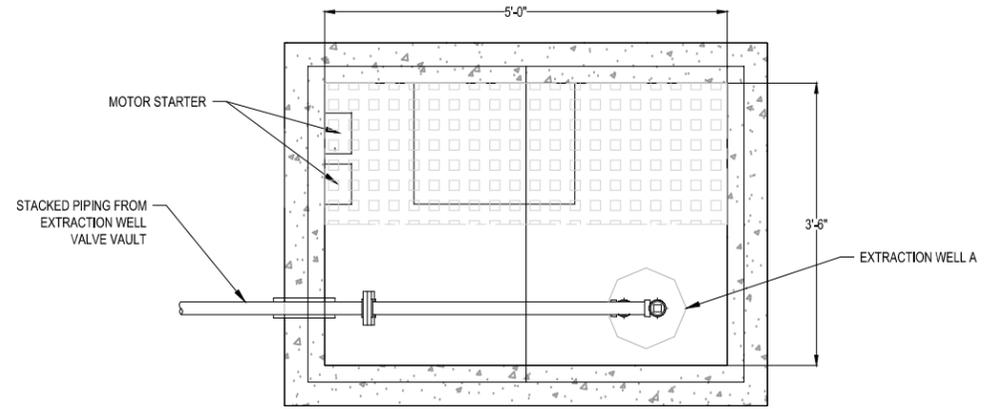
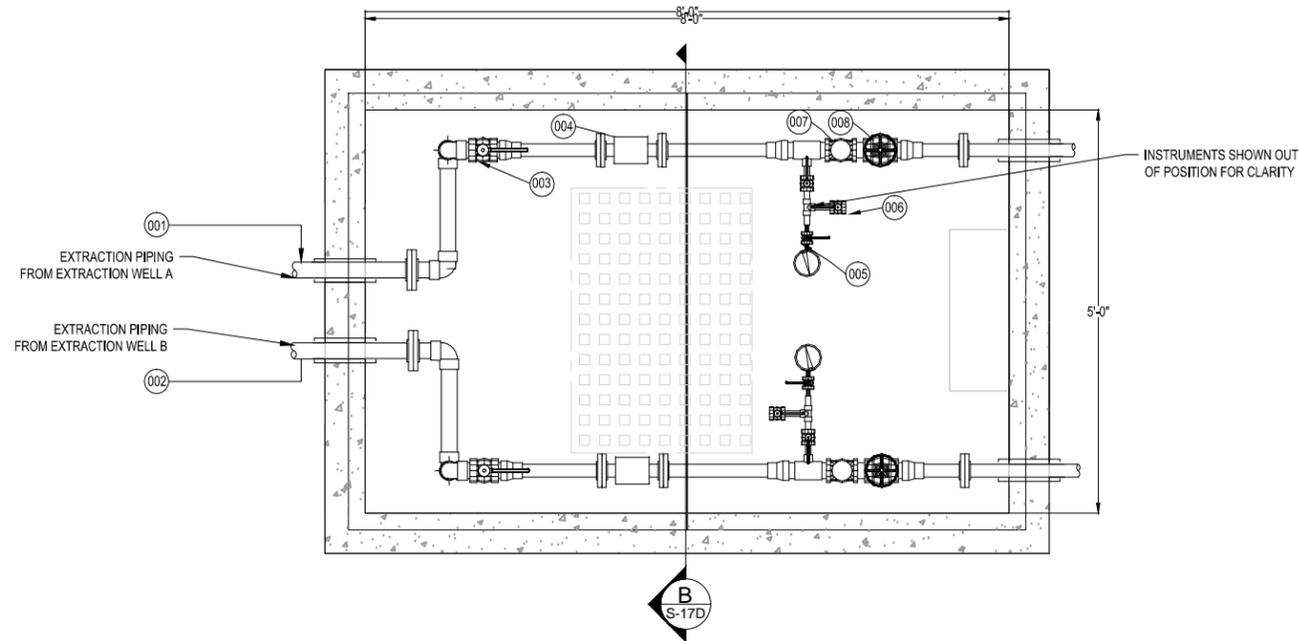
TOPOCK GROUNDWATER REMEDIATION PROJECT
MECHANICAL SECTIONS
INJECTION WELL VAULTS
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA



JCN	AREA	COUNTY	PROFILE
SHEET NO.	OF	DRAWING NUMBER	CHANGE
		M-14B	

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EXTRACTION WELL VALVE VAULT AND WELL VAULT PLAN



NOTES:

1. ALL PIPING, INSTRUMENTATION, AND OTHER COMPONENTS SHALL BE INSTALLED AS PER THE MANUFACTURER'S GUIDELINES.
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10. ALL FLANGES SHALL BE CLASS 150 RAISED FACE FLANGES UNLESS OTHERWISE NOTED.
11. ALL TRANSITION FITTINGS FOR HDPE PIPING SHALL BE FLANGED WITH BACKING RINGS.
12. DIMENSIONS ARE PRELIMINARY AND SUBJECT TO CHANGE DURING THE DETAILED ENGINEERING DESIGN.
13. ALL VAULTS WILL INCLUDE AN INTEGRAL CONCRETE SUMP AND FLOORS SLOPED TO THE SUMP. SUMP LOCATIONS WILL BE IDENTIFIED IN A FUTURE SUBMITTAL.

WELL VAULT SCHEDULE

ITEM	PIPE SIZE	PIPE MAT.	PROCESS FLOW	DESCRIPTION
1	0'-2"	CPVC	GROUNDWATER	
2	0'-2"	CPVC	GROUNDWATER	
3	0'-2"	CPVC	GROUNDWATER	ISOLATION BALL VALVE - EQUIPPED WITH STEM EXTENSION TO ALLOW FOR OPERATION FROM OUTSIDE OF VAULT
4	0'-2"	TEFLON	GROUNDWATER	MAGNETIC FLOWMETER
5	0'-0 1/2"	TBD	GROUNDWATER	PRESSURE GAUGE ASSEMBLY
6	0'-0 1/4"	TBD	GROUNDWATER	SAMPLE PORT
7	0'-2"	CPVC	GROUNDWATER	CHECK VALVE
8	0'-2"	CPVC	GROUNDWATER	GLOBE VALVE

DATUM: HORIZONTAL:	PROJECTION:	NOV 2011	PRELIMINARY PLANS - NOT FOR CONSTRUCTION	APPRO. BY:	AUTHORIZATION:
VERTICAL:	UNITS:			BY: JB	
REFERENCE DWGS:				DR: LK	
				CH: JF	
				O.K.: JF	
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TOPOCK GROUNDWATER REMEDIATION PROJECT

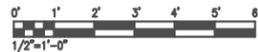
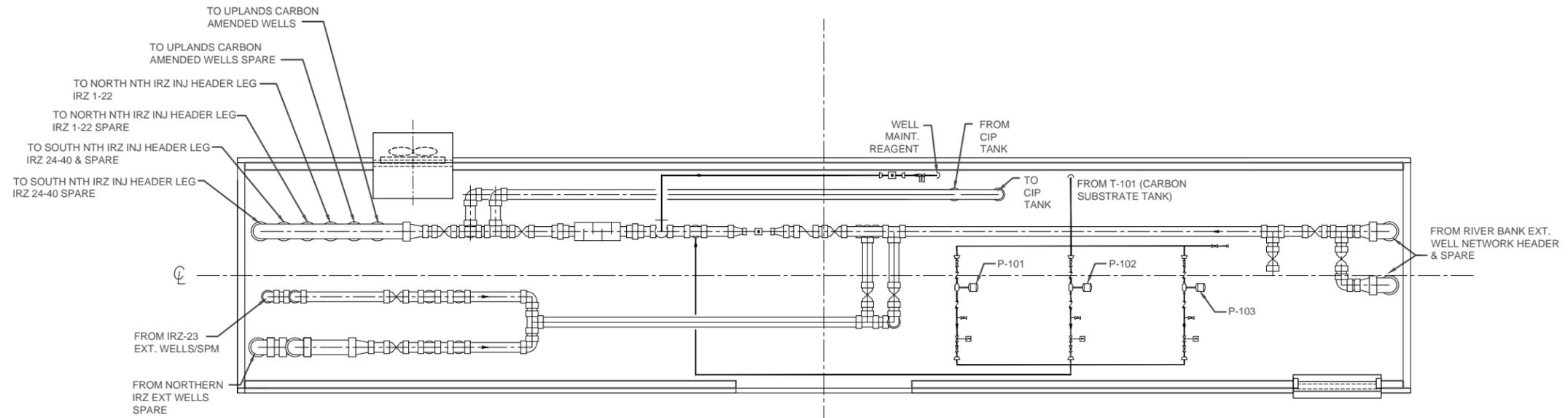
MECHANICAL DETAILS
EXTRACTION WELLS
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA



JCN	AREA	COUNTY	PROFILE
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TOPOCK GROUNDWATER REMEDIATION PROJECT
MECHANICAL LAYOUT
NTH IRZ CARBON AMENDMENT BUILDING
 PACIFIC GAS AND ELECTRIC COMPANY
 SAN FRANCISCO, CALIFORNIA

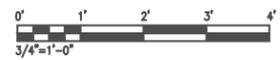
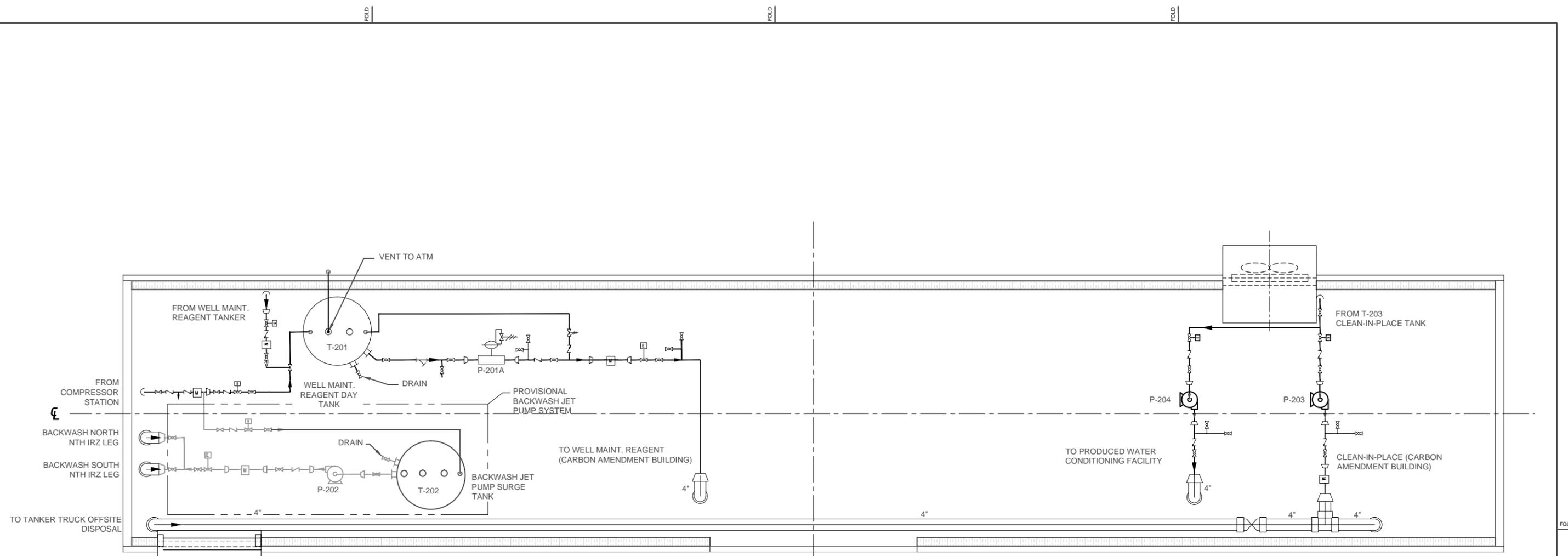


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REVISIONS																																												

APPRD BY:	AUTHORIZATION:
BY: JB	DR: CK
CH: JF	O.K.: JF
O.K.: JF	DATE:

TOPOCK GROUNDWATER REMEDIATION PROJECT
MECHANICAL LAYOUT
NTH IRZ WELL MAINTENANCE BUILDING
 PACIFIC GAS AND ELECTRIC COMPANY
 SAN FRANCISCO, CALIFORNIA



JCN:	AREA:	COUNTY:	PROFILE:
SHEET NO.:	DRAWING NUMBER:	OF:	CHANGE:
M-16			

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SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
COMPONENTS		SWITCHES - PROCESS		DEVICES - RELAY		WIRING - CONNECTIONS	
	RESISTOR		FLOW SWITCH - CLOSSES UPON INCREASING FLOW		CONTACTOR OR STARTER M1		PANEL OR EQUIPMENT WIRING
	SOLENOID COIL		FLOW SWITCH - OPENS UPON INCREASING FLOW		CONTROL RELAY CR1		FIELD WIRING
	HEATER		LEVEL SWITCH - CLOSSES UPON INCREASING LEVEL		TIME DELAY RELAY TR2 - ADJUSTABLE TIME DELAY RANGE & SETTING AS SHOWN		CONDUCTORS - NOT CONNECTED
	CAPACITOR		LEVEL SWITCH - OPENS UPON INCREASING LEVEL		TIME DELAY ON ENERGIZATION / TIME DELAY ON DE-ENERGIZATION		CONDUCTORS - CONNECTED
	DIODE		PRESSURE SWITCH - CLOSSES UPON INCREASING PRESSURE (DECREASING VACUUM)		REFERENCED RELAY WITH N.O. CONTACT ON LINE 107 N.C. CONTACT ON LINE 121		GROUND CONNECTION
	DIODE, ZENER		PRESSURE SWITCH - OPENS UPON INCREASING PRESSURE (DECREASING VACUUM)		NORMALLY OPEN, RELAY CONTACT - ACTUATED BY RELAY CR1 COIL LOCATED ON LINE 105		PLUG AND RECEPTACLE
	METAL OXIDE VARISTOR		TEMPERATURE SWITCH - CLOSSES UPON INCREASING TEMPERATURE		NORMALLY CLOSED, RELAY CONTACT - ACTUATED BY RELAY CR1		INCOMING LINE
	AUDIBLE ALARM		TEMPERATURE SWITCH - OPENS UPON INCREASING TEMPERATURE		NORMALLY OPEN, TIME DELAY RELAY CONTACT - CONTACT CLOSSES AFTER TR2 IS ENERGIZED		TERMINAL BLOCKS WITH TERMINAL NUMBER AS SHOWN
	3 PHASE MOTOR ? = MOTOR HP		LIMIT SWITCH - CLOSSES AT SET LIMIT		NORMALLY CLOSED, TIME DELAY RELAY CONTACT - CONTACT OPENS AFTER TR2 IS ENERGIZED		TERMINAL BLOCKS WITH TERMINAL NUMBER DETERMINED BY SUBMITTAL
	3 PHASE MOTOR		LIMIT SWITCH - OPENS AT SET LIMIT		NORMALLY OPEN, TIME DELAY RELAY CONTACT - CONTACT OPENS AFTER TR2 IS ENERGIZED		SHIELDED CABLE
	SINGLE PHASE MOTOR		TORQUE SWITCH - CLOSSES UPON INCREASING TORQUE		NORMALLY CLOSED, TIME DELAY RELAY CONTACT - CONTACT CLOSSES AFTER TR2 IS DE-ENERGIZED	PLAN - SYMBOLS	
	TRANSFORMER SIZE AND VOLTAGE AS SHOWN		TORQUE SWITCH - OPENS UPON INCREASING TORQUE		NORMALLY OPEN, TIME DELAY RELAY CONTACT - CONTACT OPENS AFTER TR2 IS DE-ENERGIZED		CONDUIT, EXPOSED CONDUIT, IN SLAB OR BELOW GRADE CONDUIT, CONCEALED IN WALL OR CEILING CONDUIT STUBBED OUT & CAPPED CONDUIT BENDS TOWARD OBSERVER CONDUIT BENDS AWAY FROM OBSERVER CONDUIT ENDS FLEXIBLE CONDUIT CONNECTION FROM J-BOX TO EQUIPMENT CONDUIT CHANGE IN ELEVATION
	UTILITY POWER METER		GROUND ROD		NORMALLY CLOSED, TIME DELAY RELAY CONTACT - CONTACT CLOSSES AFTER TR2 IS DE-ENERGIZED		BARE COPPER GROUND WIRE GROUND CONNECTION BOLTED TYPE GROUND CONNECTION EXOTHERMIC WELD TYPE DISCONNECT SWITCH FIELD MOUNTED DEVICE SPECIAL RECEPTACLE TELEPHONE/DATA RECEPTACLE 2 PORT TA568A, 2 CAT 6 CABLES
	UFER GROUND		CURRENT TRANSFORMER RATIO AS NOTED		CONTACT OPENS AND CLOSSES IN A TIMED REPEAT CYCLE		CONDUIT REFERENCE TO SCHEDULE THERMOSTAT EYES SEAL JUNCTION BOX PULL BOX OF SIZE SHOWN (CHRISTY BOX SIZE MINIMUM) LIGHTING FIXTURE # - CIRCUIT BREAKER NUMBER A - FIXTURE SCHEDULE REF. α - CONTROL SWITCH REFERENCE
	GROUND ROD	SWITCHES - OPERATOR		DEVICES - FRONT PANEL		DEVICES - PROTECTIVE	
	CURRENT TRANSFORMER RATIO AS NOTED		TOGGLE OR DISCONNECT SWITCH		INDICATING LIGHT, LETTER "X" INDICATES COLOR: R=RED G=GREEN, A=AMBER, W=WHITE Y=YELLOW, B=BLUE		LOW VOLTAGE MOLDED CASE, INSULATED CASE OR POWER CIRCUIT BREAKER. RATINGS AS SHOWN IN DRAWINGS AND AS DEFINED BELOW: xA: CIRCUIT BREAKER AMPERAGE xAT: AMPERAGE TRIP xAF: AMPERAGE FRAME xP: NUMBER OF POLES xT: TRIP PROTECTION MCP: MOTOR CIRCUIT PROTECTION TM: THERMAL MAGNETIC L: LONG TIME DELAY S: SHORT TIME DELAY I: INSTANTANEOUS TRIP G: GROUND FAULT A: ARC FLASH PROTECTION 100% DUTY RATED y: BREAKER FEATURES / OPTIONS - SHUNT TRIP - KIRK-KEY INTERLOCK - MANUALLY CHARGED PUSHBUTTON OPERATION - ELECTRICALLY CHARGED PUSHBUTTON OPERATION
			PUSHBUTTON - NORMALLY OPEN, MOMENTARY ACTION		INDICATING LIGHT, PUSH TO TEST		THERMAL OVERLOAD CONTACT
			PUSHBUTTON - NORMALLY CLOSED, MOMENTARY UNLESS LOS (LOCK OUT STOP) WHERE MECHANICALLY HELD		ELAPSED TIME METER		THERMAL OVERLOAD ELEMENT
			PUSHBUTTON, MECHANICALLY CONNECTED, DOUBLE CIRCUIT - NORMALLY CLOSED AND NORMALLY OPEN		100%		FUSE MEDIUM VOLTAGE CIRCUIT BREAKER
			SELECTOR SWITCH, 3 POSITION - CONTACT STATUS SHOWN EXISTS I.E. AT POSITION OF HAND, OFF, OR AUTO		52		TRIP FUNCTIONS PER DRAWINGS AND SPECIFICATIONS
			SELECTOR SWITCH, 2 POSITION - MIDDLE POSITION IS DELETED		MFR		T = TIMER SWITCH
			POTENTIOMETER				

MISCELLANEOUS ABBREVIATIONS			
&	AND	MTR	MOTOR
⊕	AT	MUX	MULTIPLEXER
A	AMBER, AMPERES	MV	MERCURY VAPOR, MEDIUM VOLTAGE
AC	ALTERNATING CURRENT	N	NEUTRAL
ACK	ACKNOWLEDGE	NC	NORMALLY CLOSED
AFF	ABOVE FINISHED FLOOR	NHC	NORMALLY HELD CLOSED
AH	AMP HOUR	NHO	NORMALLY HELD OPEN
AI	ANALOG INPUT	NIC	NOT IN CONTRACT
AIC	AMP INTERRUPTING CAPACITY SYMMETRICAL	NL	NIGHT LIGHT
AM	AMP METER	NO	NORMALLY OPEN
AO	ANALOG OUTPUT	NTS	NOT TO SCALE
AWG	AMERICAN WIRE GAUGE	(N)	NEW
ATS	AUTOMATIC TRANSFER SWITCH	OC	ON CENTER
BATT	BATTERY	OI	OPERATOR INTERFACE
(B)	PROVIDED BY OWNER - INSTALLED BY CONTRACTOR	OL	OVERLOAD
BFC	BELOW FINISHED CEILING	ORP	OXIDATION REDUCTION POTENTIAL
BOD	BIOCHEMICAL OXYGEN DEMAND	P	POLE
BPF	BAND PASS FILTER	PB	PUSHBUTTON
BYP	BYPASS	PBX	PULL BOX
C	CONDUIT	PF	POWER FACTOR
CAP	CAPACITOR	PFR	POWER FAIL RELAY
CB	CIRCUIT BREAKER	PH	HYDROGEN ION CONCENTRATION
CKT	CIRCUIT	PLC	PROGRAMMABLE LOGIC CONTROLLER
COAX	COAXIAL CABLE	PM	POWER MONITOR
COMM	COMMUNICATION	PNL	PANEL
CR	CONTROL RELAY	POT	POTENTIOMETER
CT	CURRENT TRANSFORMER	PRESS	PRESSURE
CS	CONSTANT SPEED	PR	PAIR, TWISTED AND SHIELDED
CU	COPPER	PRI	PRIMARY
DC	DIRECT CURRENT	PROVIDE	FURNISH, INSTALL, AND CONNECT
DET	DETAIL	PS	PRESSURE SWITCH
DI	DIGITAL INPUT	PT	POTENTIAL TRANSFORMER
DISC	DISCONNECT	PTT	PUSH TO TEST
DO	DIGITAL OUTPUT	PVC	POLYVINYLCHLORIDE
DPDT	DOUBLE POLE DOUBLE THROW	PWR	POWER
DWG	DRAWING	REF	REFERENCE
E-DTL	ELECTRICAL DRAWING DETAIL	RFI	RADIO FREQUENCY INTERFERENCE
ELEV	ELEVATION	RMS	ROOT MEAN SQUARE
ENET	ETHERNET	RTD	RESISTANCE TEMPERATURE DETECTOR
ETM	ELAPSED TIME METER	RST	RESET
ESW	ETHERNET SWITCH	RVAT	REDUCE VOLTAGE AUTO TRANSFORMER
(E)	EXISTING	RTU	REMOTE TERMINAL UNIT
FCS	FIELD CONTROL STATION	(R)	REWIRE, RELOCATE, REVISE, REUSE
FLA	FULL LOAD AMPS	SCH	SCHEDULE
FLEX	FLEXIBLE LIQUID TIGHT CONDUIT	SEC	SECONDARY, SECOND
FRP	FIBERGLASS REINFORCED PLASTIC	SECS	SECONDS
FS	FULL SPEED	SEL	SELECTOR
FVNR	FULL VOLTAGE NON-REVERSING	SFA	SERVICE FACTOR AMPS
FVR	FULL VOLTAGE REVERSING	SPEC	SPECIFICATION
FWD	FORWARD	SS	STAINLESS STEEL
(F)	FUTURE	SSRC	STAINLESS STEEL RIGID CONDUIT
GALV	GALVANIZED	SSS	SOLID STATE STARTER
GFI	GROUND FAULT INTERRUPTER	STT	START
GND	GROUND	STP	STOP
GRS	GALVANIZED RIGID STEEL CONDUIT	SV	SOLENOID VALVE
GRS-PVC	PVC COATED GRS CONDUIT	SW	SWITCH
HI	HIGH	SWBD	SWITCHBOARD
HIM	HUMAN INTERFACE MODULE	SYMM	SYMMETRICAL
HOA	HAND OFF AUTO	TB	TERMINAL BLOCK
HP	HORSE POWER	TC	TIME CLOCK
HPS	HIGH PRESSURE SODIUM	TDOD	TIME DELAY ON DE-ENERGIZATION
HS	HAND SWITCH	TDOE	TIME DELAY ON ENERGIZATION
HTR	HEATER	TELCO	TELEPHONE COMPANY
HZ	HERTZ	TM	THERMAL MAGNETIC
HZD	HAZARD	TEMP	TEMPERATURE
I	INTERLOCK	TR	TIME DELAY RELAY
I-DTL	INSTRUMENTATION DRAWING DETAIL	TRIAD	TWISTED AND SHIELDED 3 CONDUCTOR
I/O	INPUT/OUTPUT	TS	TEMPERATURE SWITCH
INST	INSTANTANEOUS	TSPR	TWISTED AND SHIELDED PAIR
ISR	INTRINSICALLY SAFE RELAY	TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
IS	INTRINSICALLY SAFE	TYP	TYPICAL
J	JUNCTION BOX	UG	UNDERGROUND
K	KILO, PREFIX	ULH	ULTRA LOW HARMONIC
LA	LIGHTNING ARRESTOR	UON	UNLESS OTHERWISE NOTED
LC	LIGHTING CONTACTOR	UPS	UNINTERRUPTIBLE POWER SUPPLY
LEL	LOWER EXPLOSION LIMIT	V	VOLTAGE
LO	LOW	VA	VOLT AMPS
LOS	LOCK OUT STOP	VAR	VOLT AMPS REACTIVE
LR	LATCHING RELAY	VFD	VARIABLE FREQUENCY DRIVE
LS	LIMIT SWITCH	VLV	VALVE
M	MOTOR CONTACTOR	VM	VOLTMETER
MAG	MAGNETIC FLOWMETER	VMR	VOLTAGE MONITOR RELAY
MAX	MAXIMUM	VR	VOLTAGE RELAY
MCM	THOUSAND CIRCULAR MILS	W	WATTS
MCP	MOTOR CIRCUIT PROTECTOR	WP	WEATHER PROOF, NEMA 3R
MCS	MOLDED CASE SWITCH	WTP	WATER TREATMENT PLANT
MH	MANHOLE	WWT	WASTE WATER TREATMENT PLANT
MIN	MINIMUM, MINUTE	XFMR	TRANSFORMER
MODEM	MODEM	Z	IMPEDANCE
MOV	MOTOR OPERATED VALVE	ZS	LIMIT SWITCH

DATUM: HORIZONTAL: _____ PROJECTION: _____

VERTICAL: _____ UNITS: _____

REFERENCE DWGS: _____

NOV 2011 PRELIMINARY PLANS

SCALES: 1 inch = _____ 1 centimeter = _____

NO.	DATE	DESCRIPTION	APPD.	NO.	DATE	DESCRIPTION	APPD.	NO.	DATE	DESCRIPTION

APPD. BY	AUTHORIZATION
BY THOMAS FRISCH DR BRIAN WOODIN CH THOMAS FRISCH	
DATE	

TOPOCK GROUNDWATER REMEDIATION

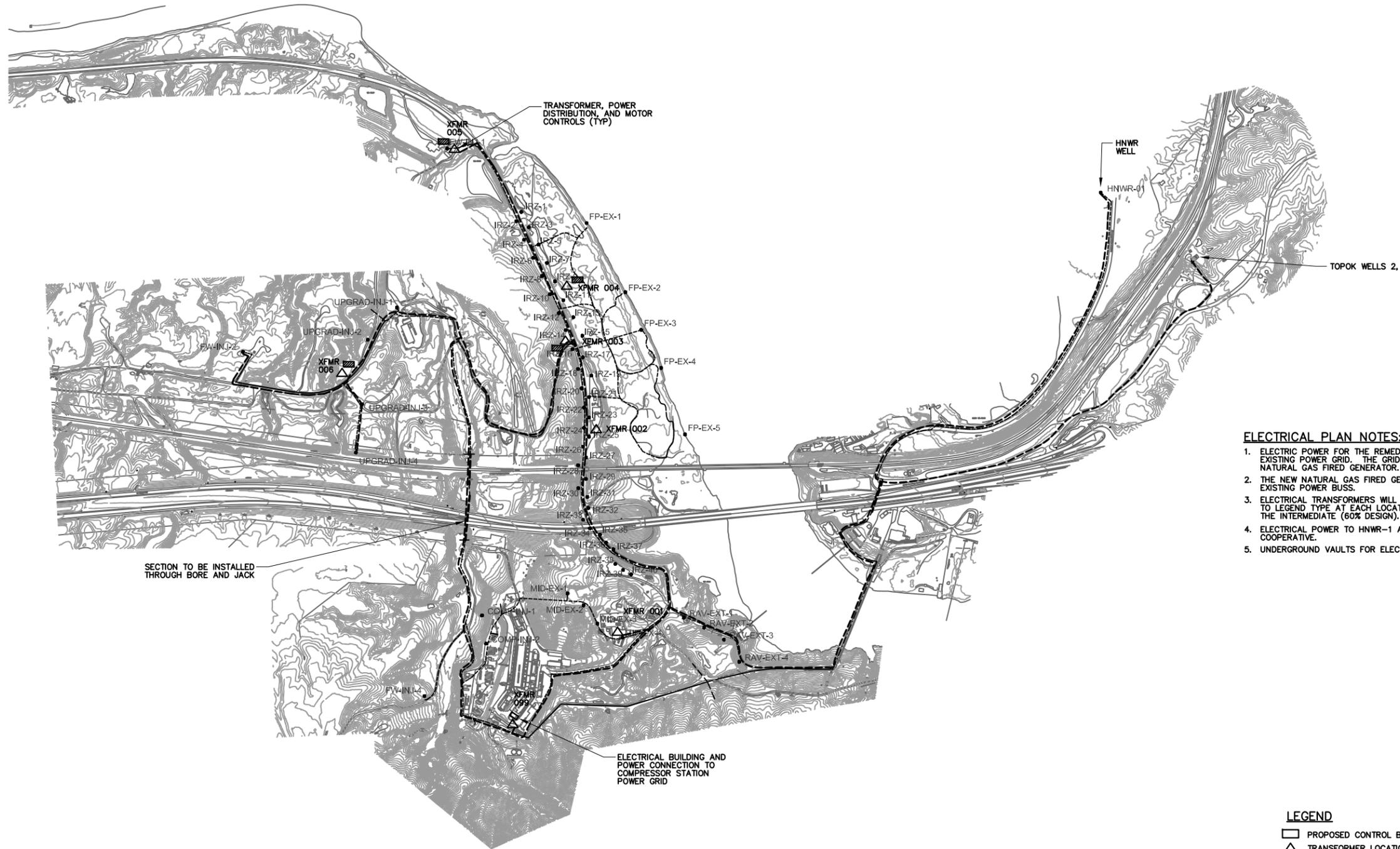
ELECTRICAL SYMBOLS AND ABBREVIATIONS

PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

JCN _____
AREA _____
COUNTY _____
PROFILE _____

SHEET NO. _____ OF _____
DRAWING NUMBER _____
CHANGE _____

E-1



- ELECTRICAL PLAN NOTES:**
1. ELECTRIC POWER FOR THE REMEDY WILL BE SUPPLIED BY THE COMPRESSOR STATION USING THE EXISTING POWER GRID. THE GRID CONSIST OF EXISTING POWER GENERATORS (P-UNITS) AND A NEW NATURAL GAS FIRED GENERATOR.
 2. THE NEW NATURAL GAS FIRED GENERATOR WILL SUPPLY 375KW, 480VAC, 3Ø, POWER MATCHING THE EXISTING POWER BUSS.
 3. ELECTRICAL TRANSFORMERS WILL BE INSTALLED BOTH ABOVE GROUND AND BELOW GROUND. REFER TO LEGEND TYPE AT EACH LOCATION. DETAILS OF UNDERGROUND VAULTS WILL BE INCLUDED IN THE INTERMEDIATE (60% DESIGN).
 4. ELECTRICAL POWER TO HNWR-1 AND TOPOCK 2 & 3 WELLS IS SUPPLIED BY MOHAVE ELECTRIC COOPERATIVE.
 5. UNDERGROUND VAULTS FOR ELECTRICAL TRANSFORMERS WILL CONFORM TO PG&E STANDARDS.

- LEGEND**
- PROPOSED CONTROL BUILDING
 - △ TRANSFORMER LOCATION (APPROX) ABOVE GRADE
 - ▲ TRANSFORMER LOCATION (APPROX) BELOW GRADE
 - UNDERGROUND 12KV DISTRIBUTION LOOP
 - PROPOSED OUTDOOR PEDESTAL

OVERALL ELECTRICAL SITE PLAN
SCALE: 1" = 400'



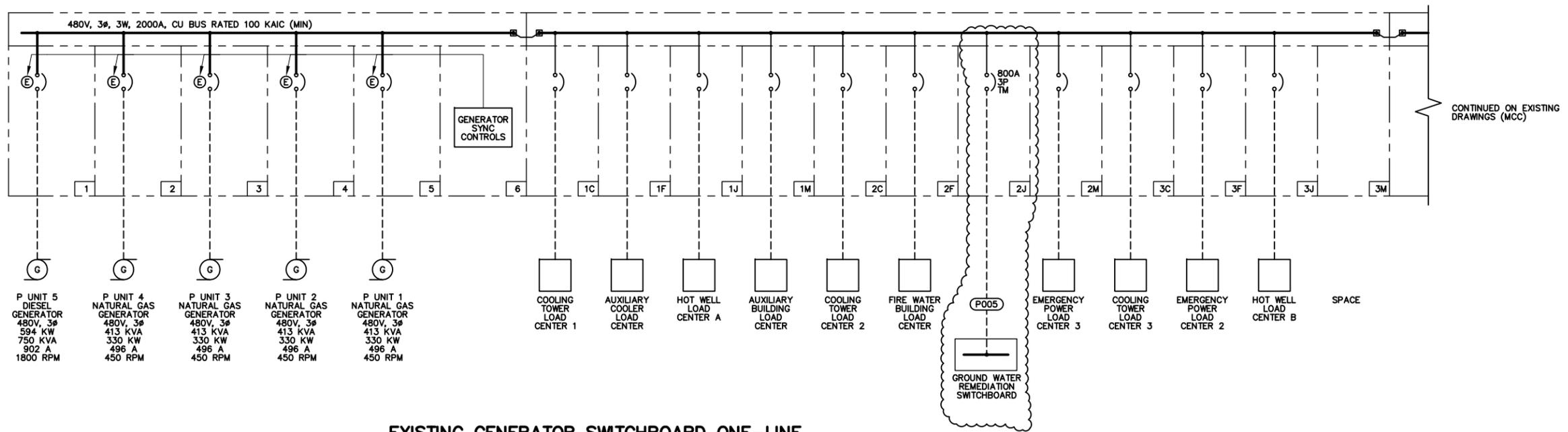
DATUM: HORIZONTAL:		PROJECTION:		NOV 2011 PRELIMINARY PLANS												APPRD BY		AUTHORIZATION									
VERTICAL:		UNITS:																									
REFERENCE DWGS:																											
SCALES: 1 inch = 1 centimeter =																											
REVISIONS														NO.		DATE		DESCRIPTION		APPRD. NO.		DATE		DESCRIPTION		APPRD.	

TOPOCK GROUNDWATER REMEDIATION
OVERALL ELECTRICAL SITE PLAN

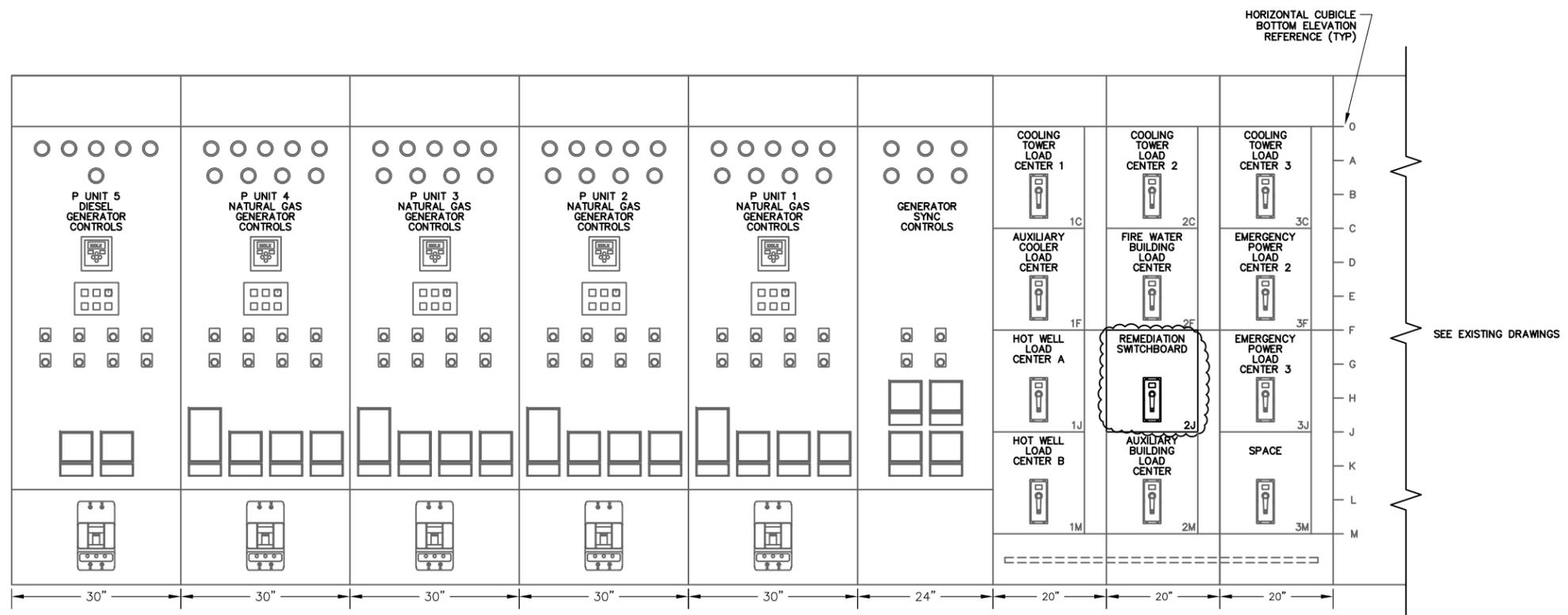
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

JCN _____
AREA _____
COUNTY _____
PROFILE _____

SHEET NO. _____ OF _____
DRAWING NUMBER _____
E-2



EXISTING GENERATOR SWITCHBOARD ONE-LINE



EXISTING GENERATOR SWITCHBOARD ELEVATION
(LOCATED AT COMPRESSOR STATION INSIDE GENERATOR ROOM)

DATUM: HORIZONTAL:	PROJECTION:	NOV 2011 PRELIMINARY PLANS
VERTICAL:	UNITS:	
REFERENCE DWGS:		
SCALES: 1 inch = 1 centimeter		

NO.	DATE	DESCRIPTION	APPD. NO.	DATE	DESCRIPTION	APPD. NO.	DATE	DESCRIPTION	APPD. NO.	DATE	DESCRIPTION
REVISIONS											

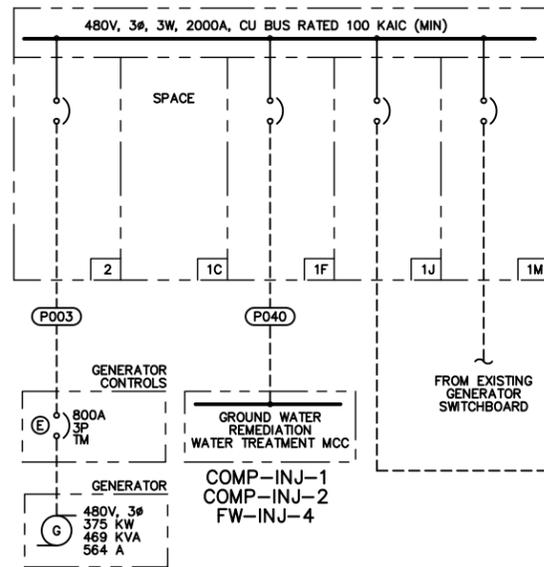
APPD BY	AUTHORIZATION
BY THOMAS FRISCH DR BRIAN WOODIN CH THOMAS FRISCH O,K, DATE	

TOPOCK GROUNDWATER REMEDIATION
EXISTING GENERATOR SWITCHBOARD ONE-LINE DIAGRAM AND ELEVATION
 PACIFIC GAS AND ELECTRIC COMPANY
 SAN FRANCISCO, CALIFORNIA

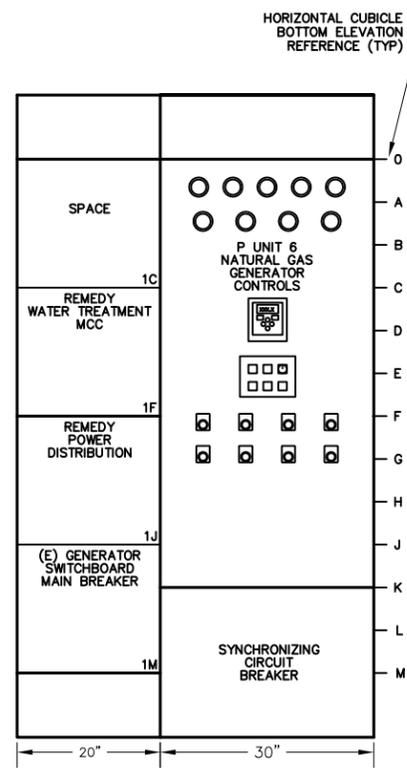
JCN _____
 AREA _____
 COUNTY _____
 PROFILE _____

SHEET NO. _____ OF _____
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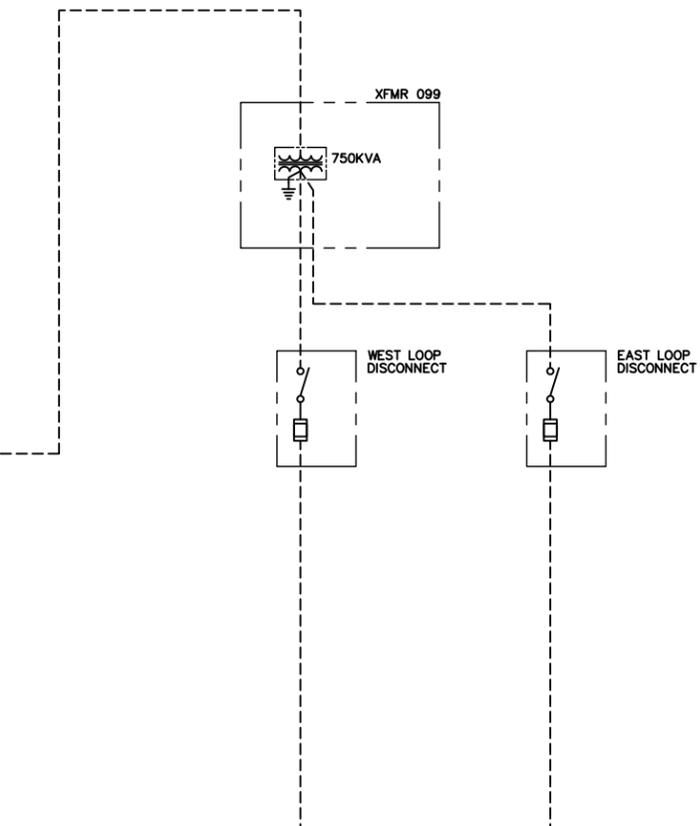
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GROUNDWATER REMEDIATION SWITCHBOARD ONE-LINE DIAGRAM



GROUNDWATER REMEDIATION SWITCHBOARD ELEVATION



GROUND WATER REMEDIATION POWER DISTRIBUTION ONE-LINE DIAGRAM

TOTAL REMEDY LOAD CALCULATIONS									
LOAD DESCRIPTION	CONNECTED LOAD			DEMAND LOAD			GENERATOR LOAD		
	LOAD	QTY	TOTAL	LOAD	QTY	TOTAL	LOAD	QTY	TOTAL
REMEDY MCC	107.34 A	1	89239.1 VA	86.92 A	1	72267.2 VA	86.92 A	1	72267.2 VA
TRANSFORMER 001	85.2 A	1	70867.2 VA	61.59 A	1	51205.0 VA	61.59 A	1	51205.0 VA
TRANSFORMER 002	449.9 A	1	374014.9 VA	117.06 A	1	97321.9 VA	117.06 A	1	97321.9 VA
TRANSFORMER 003	553.9 A	1	460537.1 VA	8.36 A	1	6950.4 VA	8.36 A	1	6950.4 VA
TRANSFORMER 004	306.7 A	1	255018.8 VA	240.74 A	1	200147.5 VA	240.74 A	1	200147.5 VA
TRANSFORMER 005	81.9 A	1	68098.7 VA	5.04 A	1	4190.2 VA	5.04 A	1	4190.2 VA
TRANSFORMER 006	389.8 A	1	324081.9 VA	5.97 A	1	4963.4 VA	5.97 A	1	4963.4 VA
TOTAL LOAD =			1974.85 A	1641857.8 VA	525.68 A	437045.4 VA	525.68 A	437045.4 VA	
LOAD CORRECTION FACTORS									
LARGEST MOTOR LOAD x 25%:									
30 HP HP => 0.25 x 37412.3 VA			=	11.25 A	9353.1 VA	11.25 A	9353.1 VA	GENERATOR SIZE = 375 KW	
80% BREAKER DERATING = TOTAL x 0.25			=	496.52 A	412802.7 VA	134.23 A	111599.6 VA	SIZE = 468.75 KVA	
FOR CONTINUOUS LOADS NEC 210-20								AMPERAGE = 564 A	
SERVICE SIZE (MIN) =			2482.62 A	2064013.6VA	671.17 A	557998.1VA	UTILIZATION % = 93 %		
MAIN BREAKER SIZE REQUIRED =						1200 AMP	MAX VOLT DIP % = 5 %		
480V, 3 PHASE, 4 WIRE									

LOAD CALCULATIONS - REMEDY WWTP MCC									
LOAD DESCRIPTION	CONNECTED LOAD			DEMAND LOAD			GENERATOR LOAD		
	LOAD	QTY	TOTAL	LOAD	QTY	TOTAL	LOAD	QTY	TOTAL
7.5 HP COMP-INJ-1	11.0 A	1	9145.2 VA	11.00 A	1	9145.2 VA	11.00 A	1	9145.2 VA
7.5 HP COMP-INJ-2	11.0 A	1	9145.2 VA	11.00 A	1	9145.2 VA	11.00 A	1	9145.2 VA
40 HP FW-INJ-4	45.0 A	1	37412.3 VA	45.00 A	1	37412.3 VA	45.00 A	1	37412.3 VA
1HP INFLUENT STORAGE TANK MIXER	2.10 A	1	1745.9 VA	2.10 A	1	1745.9 VA	2.10 A	1	1745.9 VA
5 HP REMEDY WW FILTER PUMP	7.60 A	2	12637.0 VA	7.60 A	1	6318.5 VA	7.60 A	1	6318.5 VA
2 HP REMEDY WW TRUCK FILL PUMPS	3.40 A	2	5653.4 VA	3.40 A	0	0.0 VA	3.40 A	0	0.0 VA
30 KVA MSB TRANSFORMER	16.24 A	1	13500.0 VA	10.22 A	1	8500.0 VA	10.22 A	1	8500.0 VA
TOTAL LOAD =			107.34 A	89239.1 VA	86.92 A	72267.2 VA	86.92 A	72267.2 VA	
LOAD CORRECTION FACTORS									
LARGEST MOTOR LOAD x 25%:									
40 HP HP => 0.25 x 2826.7 VA			=	0.85 A	706.7 VA	0.85 A	706.7 VA		
80% BREAKER DERATING = TOTAL x 0.25			=	27.05 A	22486.4 VA	21.94 A	18243.5 VA		
FOR CONTINUOUS LOADS NEC 210-20									
SERVICE SIZE (MIN) =			135.23 A	112432.2VA	109.72 A	91217.3VA			
MAIN BREAKER SIZE REQUIRED =						400 AMP			
480V, 3 PHASE, 4 WIRE									

DATUM: HORIZONTAL: _____ PROJECTION: _____

VERTICAL: _____ UNITS: _____

REFERENCE DWGS: _____

NOV 2011 PRELIMINARY PLANS

NO. DATE DESCRIPTION APPD. NO. DATE DESCRIPTION

REVISIONS

SCALES: 1 inch = _____ 1 centimeter = _____

APPRD BY: _____ AUTHORIZATION: _____

BY THOMAS FRISCH
DR BRIAN WOODIN
CH THOMAS FRISCH
D,K,
DATE _____

TOPOCK GROUNDWATER REMEDIATION
REMEDY POWER DISTRIBUTION
ONE-LINE DIAGRAM

PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

JCN _____
AREA _____
COUNTY _____
PROFILE _____

SHEET NO. _____ OF _____
DRAWING NUMBER _____
CHANGE _____

E-5

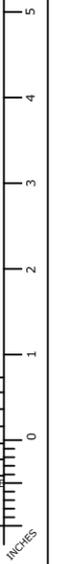
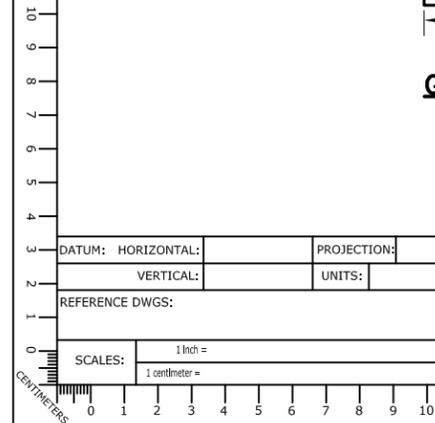


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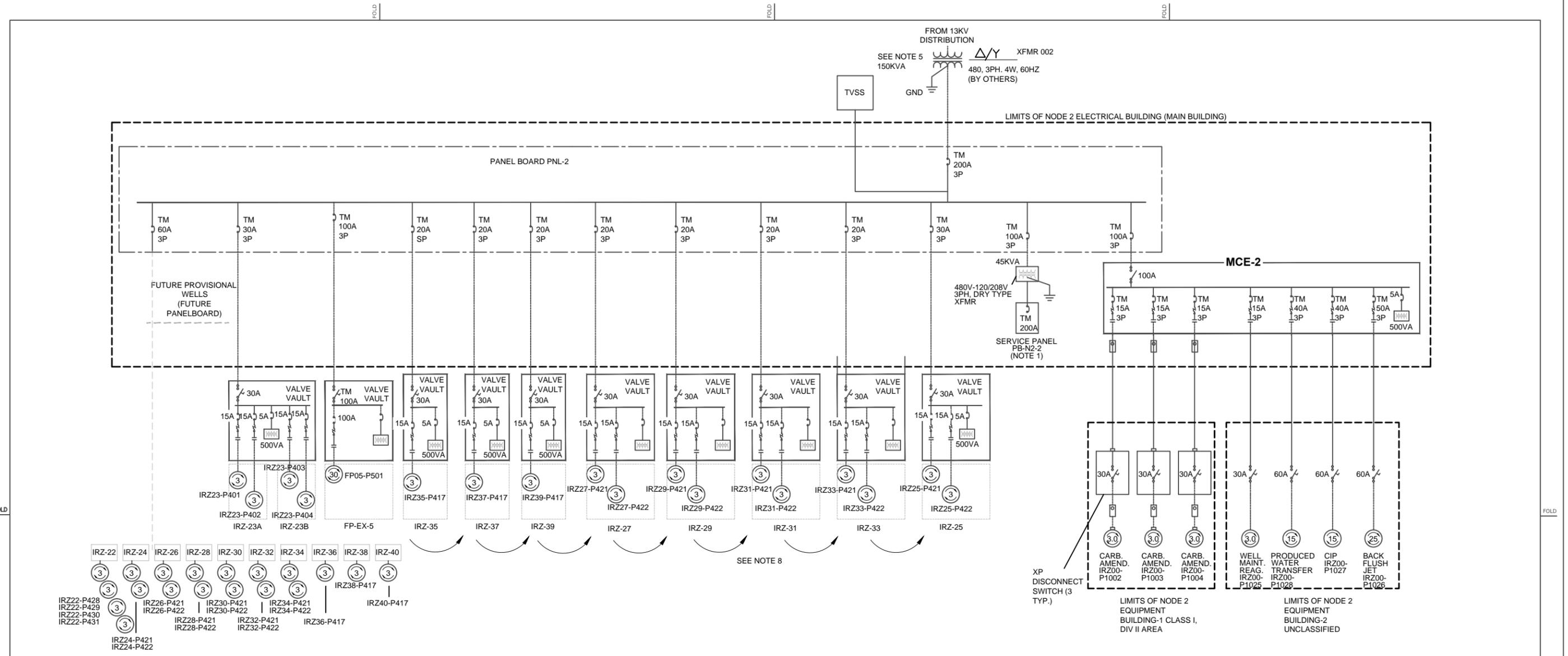
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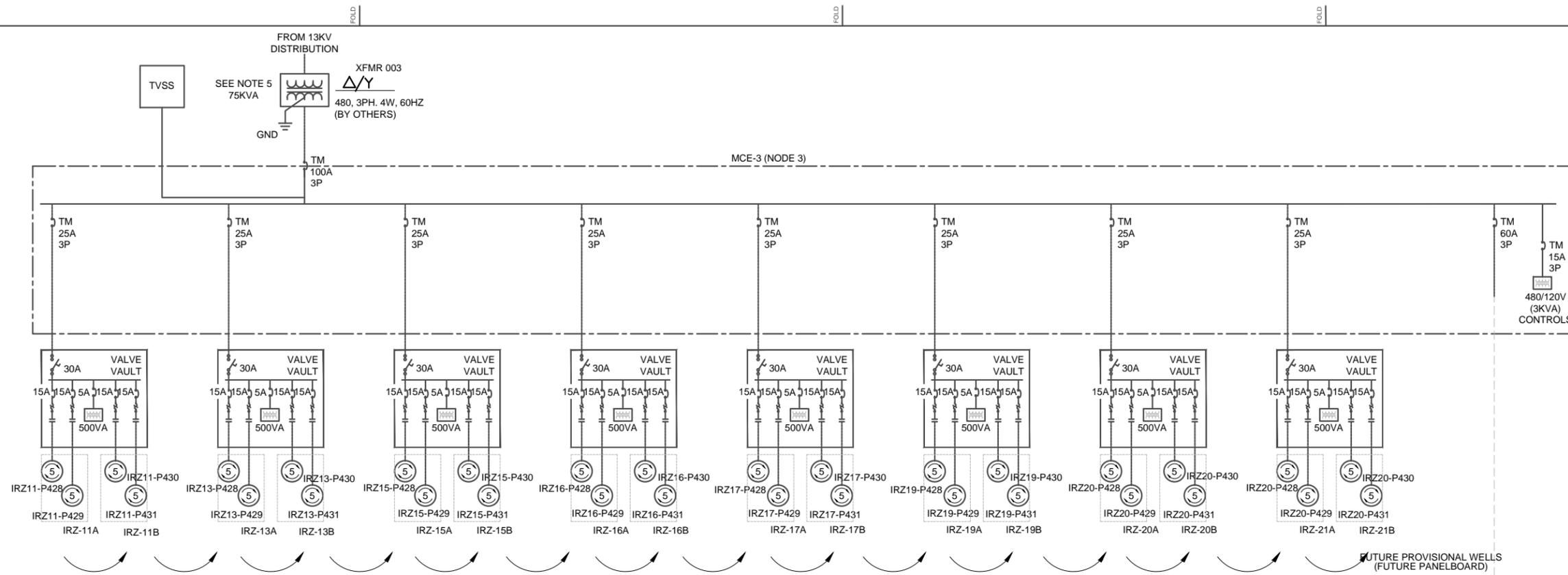
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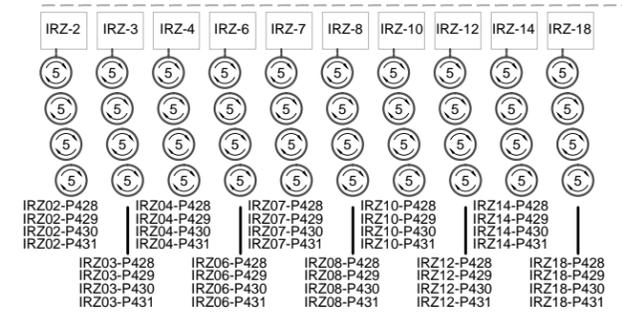
- NOTES:
- SERVICE PANEL PNL-1 TO PROVIDE POWER TO HVAC, RECEPTACLES, LIGHTING, AND FANS.
 - WIRE AND CONDUIT SIZES TO BE DETERMINED AT 60% AND 90% DESIGN.
 - BACKWASH PUMPS ARE LIGHT DUTY PUMPS THAT WILL BE OPERATED AT APPROXIMATELY 30 MINUTES PER WEEK. ONLY ONE BACKWASH PUMP WILL BE OPERATED AT A GIVEN TIME, AND WILL BE OPERATED IN SEQUENCE.
 - POWER METERING ASSUMED NOT TO BE REQUIRED AT INDIVIDUAL NODES.
 - 150KVA TRANSFORMER IS SIZED TO ACCOMMODATE FUTURE PROVISIONAL EXPANSION.
 - ALL ELECTRICAL WELL ENCLOSURES DEPLOYED IN SUBGRADE VAULTS SHOULD BE NEMA TYPE 6P PROVIDING A DEGREE OF PROTECTION AGAINST ENTRY OF WATER DURING PROLONGED SUBMERSION AT A LIMITED DEPTH.
 - SEAL-OFF FITTINGS SHALL BE INSTALLED ON ALL CONDUITS WHICH PENETRATE INTO CLASSIFIED AREAS. PLACE SEAL-OFF WITHIN 18" OF ENTERING OR LEAVING THE CLASSIFIED AREA.
 - EACH WELL PUMP JUNCTION BOX INSIDE WELL VAULT MUST BE LABELED INDICATING LOCKOUT/TAGOUT LOCATION INSIDE IT'S CORRESPONDING VALVE VAULT.

DATUM: HORIZONTAL:	PROJECTION:	NOV 2011	PRELIMINARY PLANS - NOT FOR CONSTRUCTION	APPRD BY:	AUTHORIZATION:	TOPOCK GROUNDWATER REMEDIATION PROJECT	JCN _____ AREA _____ COUNTY _____ PROFILE _____
VERTICAL:	UNITS:			BY MS DR CK CH RT O.K. JF	DATE:		
REFERENCE DWGS:						PACIFIC GAS AND ELECTRIC COMPANY SAN FRANCISCO, CALIFORNIA	DRAWING NUMBER E-7
SCALES: 1 inch = _____ 1 centimeter = _____							CHANGE _____

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SEE NOTE 7



- NOTES:
1. WIRE AND CONDUIT SIZES TO BE DETERMINED AT 60% AND 90% DESIGN.
 2. BACKWASH PUMPS ARE LIGHT DUTY PUMPS THAT WILL BE OPERATED AT APPROXIMATELY 30 MINUTES PER WEEK. ONLY ONE BACKWASH PUMP WILL BE OPERATED AT A GIVEN TIME, AND WILL BE OPERATED IN SEQUENCE.
 3. INJECTION WELL BACKWASH PUMPS RUN IN SEQUENCE AS SHOWN. TOTAL LOAD IS CALCULATED BASED ON THE SEQUENCE USING HIGHEST HP IN THE SET.
 4. POWER METERING ASSUMED NOT TO BE REQUIRED AT INDIVIDUAL NODES.
 5. 75KVA TRANSFORMER IS SIZED TO ACCOMMODATE FUTURE PROVISIONAL EXPANSION.
 6. ALL ELECTRICAL WELL ENCLOSURES DEPLOYED IN SUBGRADE VAULTS SHOULD BE NEMA TYPE 6P PROVIDING A DEGREE OF PROTECTION AGAINST ENTRY OF WATER DURING PROLONGED SUBMERSION AT A LIMITED DEPTH.
 7. EACH WELL PUMP JUNCTION BOX INSIDE WELL VAULT MUST BE LABELED INDICATING LOCKOUT/TAGOUT LOCATION INSIDE ITS CORRESPONDING VALVE VAULT.

DATE: NOV 2011		DESCRIPTION: PRELIMINARY PLANS - NOT FOR CONSTRUCTION		APPROVED BY:		AUTHORIZATION:		TOPOCK GROUNDWATER REMEDIATION PROJECT SINGLE LINE DIAGRAM NODE 3 PACIFIC GAS AND ELECTRIC COMPANY SAN FRANCISCO, CALIFORNIA				JCN _____ AREA _____ COUNTY _____ PROFILE _____	
SCALE: 1 inch = 1 centimeter		REVISIONS:		BY: MS		DATE:						SHEET NO. _____ OF _____ DRAWING NUMBER _____ E-8	

TRANSFORMER	KWH/YR
XFMR 001	65215.6
XFMR 002	278197.4
XFMR 003	26491.5
XFMR 004	640925.5
XFMR 005	23070.2
XFMR 006	28953.0
MAIN MCC	278517.8
TOTAL	1341370.9

XFMR 001 (NODE 1), ESTIMATED ACTUAL LOAD SCHEDULE							
DEVICE	VOLTAGE	PHASE	BHP	DUTY FACTOR	kW	kW-hr/yr	
MID01-P801	480	3	0.90	100.0%	0.67	5901	
MID02-P801	480	3	0.68	100.0%	0.50	4412	
MID03-P801	480	3	0.34	100.0%	0.25	2195	
MID04-P801	480	3	0.22	100.0%	0.17	1466	
RAV01-P701	480	3	0.16	50.0%	0.12	530	
RAV02-P701	480	3	0.16	50.0%	0.12	523	
RAV03-P701	480	3	0.16	50.0%	0.12	516	
RAV04-P701	480	3	0.16	50.0%	0.12	508	
TCS00-P904	480	3	1.80	30.0%	1.34	3528	
TCS00-P905	480	3	1.80	30.0%	1.34	3528	
TCS00-P906	480	3	1.80	5.0%	1.34	588	
45 kVA TRANSFORMER(1)	480	3	---	100.0%	30.60	26806	
MCE-1 CONTROLS	480	3	---	100.0%	0.68	5957	
TOTAL 6 KVA WELLS CONTROL TRANSFORMER	480	3	---	100.0%	1.00	8760	
SUBTOTALS :					38	65216	

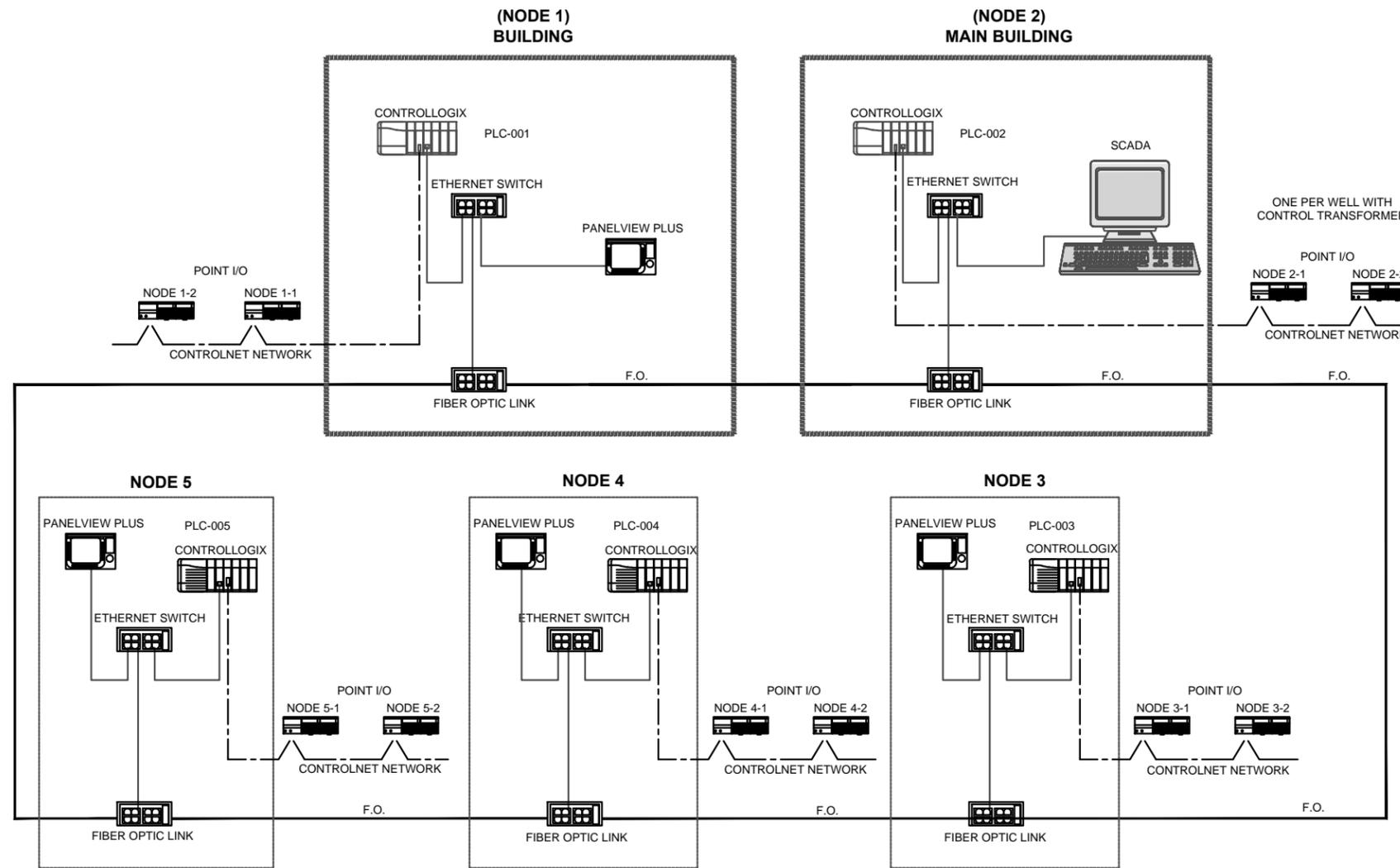
XFMR 002 (NODE 2), ESTIMATED ACTUAL LOAD SCHEDULE							
DEVICE	VOLTAGE	PHASE	BHP	DUTY FACTOR	kW	kW-hr/yr	
IRZ23-P401	480	3	4.86	50.0%	3.63	15880	
IRZ23-P402	480	3	4.86	50.0%	3.63	15880	
IRZ23-P403	480	3	4.86	50.0%	3.63	15880	
IRZ23-P404	480	3	4.86	50.0%	3.63	15880	
IRZ25-P421	480	3	2.60	0.3%	1.94	50	
IRZ25-P422	480	3	2.60	0.3%	1.94	50	
IRZ27-P421	480	3	2.60	0.3%	1.94	50	
IRZ27-P422	480	3	2.60	0.3%	1.94	50	
IRZ29-P421	480	3	2.60	0.3%	1.94	50	
IRZ29-P422	480	3	2.60	0.3%	1.94	50	
IRZ31-P421	480	3	2.60	0.3%	1.94	50	
IRZ31-P422	480	3	2.60	0.3%	1.94	50	
IRZ33-P421	480	3	2.60	0.3%	1.94	50	
IRZ33-P422	480	3	2.60	0.3%	1.94	50	
IRZ35-P421	480	3	2.60	0.3%	1.94	50	
IRZ37-P421	480	3	2.60	0.3%	1.94	50	
IRZ39-P421	480	3	2.60	0.3%	1.94	50	
FP05-P501	480	3	21.48	100.0%	16.02	140324	
IRZ22-P428 [Future Provisional]	480	3	2.60	0.0%	1.94	0	
IRZ22-P429 [Future Provisional]	480	3	2.60	0.0%	1.94	0	
IRZ22-P430 [Future Provisional]	480	3	2.60	0.0%	1.94	0	
IRZ22-P431 [Future Provisional]	480	3	2.60	0.0%	1.94	0	
IRZ24-P421 [Future Provisional]	480	3	2.60	0.0%	1.94	0	
IRZ24-P422 [Future Provisional]	480	3	2.60	0.0%	1.94	0	
IRZ26-P421 [Future Provisional]	480	3	2.60	0.0%	1.94	0	
IRZ26-P422 [Future Provisional]	480	3	2.60	0.0%	1.94	0	
IRZ28-P421 [Future Provisional]	480	3	2.60	0.0%	1.94	0	
IRZ28-P422 [Future Provisional]	480	3	2.60	0.0%	1.94	0	
IRZ30-P421 [Future Provisional]	480	3	2.60	0.0%	1.94	0	
IRZ30-P422 [Future Provisional]	480	3	2.60	0.0%	1.94	0	
IRZ32-P421 [Future Provisional]	480	3	2.60	0.0%	1.94	0	
IRZ32-P422 [Future Provisional]	480	3	2.60	0.0%	1.94	0	
IRZ34-P421 [Future Provisional]	480	3	2.60	0.0%	1.94	0	
IRZ34-P422 [Future Provisional]	480	3	2.60	0.0%	1.94	0	
IRZ36-P417 [Future Provisional]	480	3	2.60	0.0%	1.94	0	
IRZ38-P417 [Future Provisional]	480	3	2.60	0.0%	1.94	0	
IRZ40-P417 [Future Provisional]	480	3	2.60	0.0%	1.94	0	
IRZ00-P1002	480	3	1.80	30.0%	1.34	3528	
IRZ00-P1003	480	3	1.80	30.0%	1.34	3528	
IRZ00-P1004	480	3	1.80	30.0%	1.34	3528	
IRZ00-P1025	480	3	1.80	5.0%	1.34	588	
IRZ00-P1028	480	3	4.42	25.0%	3.30	7217	
IRZ00-P1027	480	3	16.93	5.0%	12.62	5528	
IRZ00-P1926	480	3	11.06	5.0%	8.25	3612	
45 kVA TRANSFORMER(1)	480	3	---	100.0%	30.60	40208	
MCE-2 CONTROLS	480	3	---	100.0%	0.68	5957	
TOTAL 5 KVA WELLS CONTROL TRANSFORMER#80					3	3	
SUBTOTALS :					157	278197	

XFMR 003 (NODE 3), ESTIMATED ACTUAL LOAD SCHEDULE							
DEVICE	VOLTAGE	PHASE	BHP	DUTY FACTOR	kW	kW-hr/yr	
IRZ11-P428	480	3	2.60	0.3%	1.94	50	
IRZ11-P429	480	3	2.60	0.3%	1.94	50	
IRZ11-P430	480	3	2.60	0.3%	1.94	50	
IRZ11-P431	480	3	2.60	0.3%	1.94	50	
IRZ13-P428	480	3	2.60	0.3%	1.94	50	
IRZ13-P429	480	3	2.60	0.3%	1.94	50	
IRZ13-P430	480	3	2.60	0.3%	1.94	50	
IRZ13-P431	480	3	2.60	0.3%	1.94	50	
IRZ15-P428	480	3	2.60	0.3%	1.94	50	
IRZ15-P429	480	3	2.60	0.3%	1.94	50	
IRZ15-P430	480	3	2.60	0.3%	1.94	50	
IRZ15-P431	480	3	2.60	0.3%	1.94	50	
IRZ16-P428	480	3	2.60	0.3%	1.94	50	
IRZ16-P429	480	3	2.60	0.3%	1.94	50	
IRZ16-P430	480	3	2.60	0.3%	1.94	50	
IRZ16-P431	480	3	2.60	0.3%	1.94	50	
IRZ17-P428	480	3	2.60	0.3%	1.94	50	
IRZ17-P429	480	3	2.60	0.3%	1.94	50	
IRZ17-P430	480	3	2.60	0.3%	1.94	50	
IRZ17-P431	480	3	2.60	0.3%	1.94	50	
IRZ19-P428	480	3	2.60	0.3%	1.94	50	
IRZ19-P429	480	3	2.60	0.3%	1.94	50	
IRZ19-P430	480	3	2.60	0.3%	1.94	50	
IRZ19-P431	480	3	2.60	0.3%	1.94	50	
IRZ20-P428	480	3	2.60	0.3%	1.94	50	
IRZ20-P429	480	3	2.60	0.3%	1.94	50	
IRZ20-P430	480	3	2.60	0.3%	1.94	50	
IRZ20-P431	480	3	2.60	0.3%	1.94	50	
IRZ21-P428	480	3	2.60	0.3%	1.94	50	
IRZ21-P429	480	3	2.60	0.3%	1.94	50	
IRZ21-P430	480	3	2.60	0.3%	1.94	50	
IRZ21-P431	480	3	2.60	0.3%	1.94	50	
IRZ02-P428 [Future Provisional]	480	3	2.60	0.0%	1.94	0	
IRZ02-P429 [Future Provisional]	480	3	2.60	0.0%	1.94	0	
IRZ02-P430 [Future Provisional]	480	3	2.60	0.0%	1.94	0	
IRZ02-P431 [Future Provisional]	480	3	2.60	0.0%	1.94	0	
IRZ03-P428 [Future Provisional]	480	3	2.60	0.0%	1.94	0	
IRZ03-P429 [Future Provisional]	480	3	2.60	0.0%	1.94	0	
IRZ03-P430 [Future Provisional]	480	3	2.60	0.0%	1.94	0	
IRZ03-P431 [Future Provisional]	480	3	2.60	0.0%	1.94	0	
IRZ04-P428 [Future Provisional]	480	3	2.60	0.0%	1.94	0	
IRZ04-P429 [Future Provisional]	480	3	2.60	0.0%	1.94	0	
IRZ04-P430 [Future Provisional]	480	3	2.60	0.0%	1.94	0	
IRZ04-P431 [Future Provisional]	480	3	2.60	0.0%	1.94	0	
IRZ06-P428 [Future Provisional]	480	3	2.60	0.0%	1.94	0	
IRZ06-P429 [Future Provisional]	480	3	2.60	0.0%	1.94	0	
IRZ06-P430 [Future Provisional]	480	3	2.60	0.0%	1.94	0	
IRZ06-P431 [Future Provisional]	480	3	2.60	0.0%	1.94	0	
IRZ07-P428 [Future Provisional]	480	3	2.60	0.0%	1.94	0	
IRZ07-P429 [Future Provisional]	480	3	2.60	0.0%	1.94	0	
IRZ07-P430 [Future Provisional]	480	3	2.60	0.0%	1.94	0	
IRZ07-P431 [Future Provisional]	480	3	2.60	0.0%	1.94	0	
IRZ08-P428 [Future Provisional]	480	3	2.60	0.0%	1.94	0	
IRZ08-P429 [Future Provisional]	480	3	2.60	0.0%	1.94	0	
IRZ08-P430 [Future Provisional]	480	3	2.60	0.0%	1.94	0	
IRZ08-P431 [Future Provisional]	480	3	2.60	0.0%	1.94	0	
IRZ10-P428 [Future Provisional]	480	3	2.60	0.0%	1.94	0	
IRZ10-P429 [Future Provisional]	480	3	2.60	0.0%	1.94	0	
IRZ10-P430 [Future Provisional]	480	3	2.60	0.0%	1.94	0	
IRZ10-P431 [Future Provisional]	480	3	2.60	0.0%	1.94	0	
IRZ12-P428 [Future Provisional]	480	3	2.60	0.0%	1.94	0	
IRZ12-P429 [Future Provisional]	480	3	2.60	0.0%	1.94	0	
IRZ12-P430 [Future Provisional]	480	3	2.60	0.0%	1.94	0	
IRZ12-P431 [Future Provisional]	480	3	2.60	0.0%	1.94	0	
IRZ14-P428 [Future Provisional]	480	3	2.60	0.0%	1.94	0	
IRZ14-P429 [Future Provisional]	480	3	2.60	0.0%	1.94	0	
IRZ14-P430 [Future Provisional]	480	3	2.60	0.0%	1.94	0	
IRZ14-P431 [Future Provisional]	480	3	2.60	0.0%	1.94	0	
IRZ18-P428 [Future Provisional]	480	3	2.60	0.0%	1.94	0	
IRZ18-P429 [Future Provisional]	480	3	2.60	0.0%	1.94	0	
IRZ18-P430 [Future Provisional]	480	3	2.60	0.0%	1.94	0	
IRZ18-P431 [Future Provisional]	480	3	2.60	0.0%	1.94	0	
MCE-3 CONTROLS	480	3	---	100.0%	2.04	17870	
TOTAL 6 KVA WELLS CONTROL TRANSFORMER					480	3	
SUBTOTALS :					142	26492	

XFMR 004 (NODE 4), ESTIMATED ACTUAL LOAD SCHEDULE							
DEVICE	VOLTAGE	PHASE	BHP	DUTY FACTOR	kW	kW-hr/yr	
FP01-P501	480	3	21.48	100.0%	16.02	140324	
FP02-P501	480	3	21.07	0.0%	15.71	0	
FP03-P501	480	3	21.89	100.0%	16.33	143021	
FP04-P501	480	3	21.89	100.0%	16.33	143021	
IRZ01-P409	480	3	4.84	50.0%	3.61	15807	
IRZ01-P410	480	3	4.84	50.0%	3.61	15807	
IRZ01-P411	480	3	4.84	50.0%	3.61	15807	
IRZ01-P412	480	3	4.84	50.0%	3.61	15807	
IRZ05-P409	480	3	4.84	50.0%	3.61	15807	
IRZ05-P410	480	3	4.84	50.0%	3.61	15807	
IRZ05-P411	480	3	4.84	50.0%	3.61	15807	
IRZ05-P412	480	3	4.84	50.0%	3.61	15807	
IRZ09-P409	480	3	4.84	50.0%	3.61	15807	
IRZ09-P410	480	3	4.84	50.0%	3.61	15807	
IRZ09-P411	480	3	4.84	50.0%	3.61	15807	
IRZ09-P412	480	3	4.84	50.0%	3.61	15807	
MCE-4 CONTROLS	480	3	---	100.0%	2.04	17870	
TOTAL 6 KVA WELLS CONTROL TRANSFORMER	480	3	---	100.0%	0.80	7008	
SUBTOTALS :					111	640925	

XFMR 005 (NODE 5), ESTIMATED ACTUAL LOAD SCHEDULE							
DEVICE	VOLTAGE	PHASE	BHP	DUTY FACTOR	kW	kW-hr/yr	
FW-INJ-1	480	3	46.30	0.3%	34.53	907	
MCE-6 CONTROLS	480	3	---	100.0%	1.73	15155	
TOTAL 6 KVA WELLS CONTROL TRANSFORMER	480	3	---	100.0%	0.80	7008	
SUBTOTALS :					37	23070	

XFMR 006 (NODE 6), ESTIMATED ACTUAL LOAD SCHEDULE							
DEVICE	VOLTAGE	PHASE	BHP				



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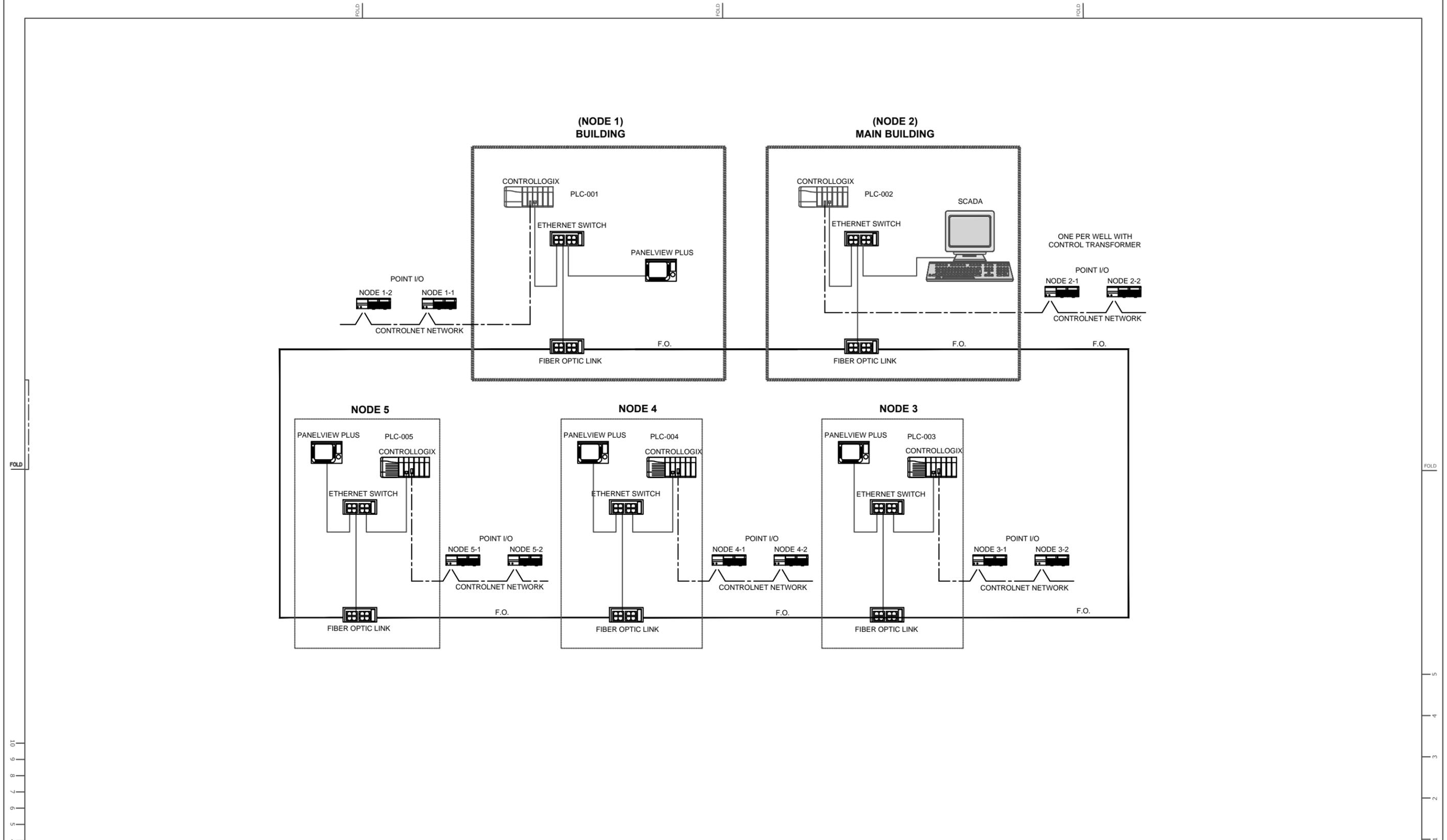
DATE: NOV 2011		DESCRIPTION: PRELIMINARY PLANS - NOT FOR CONSTRUCTION		APPROVED BY:		AUTHORIZATION:	
SCALES: 1 inch = 1 centimeter		REVISIONS		BY: MS		DATE:	
				DR: CK			
				CH: RT			
				O.K.: JF			
				DATE:			

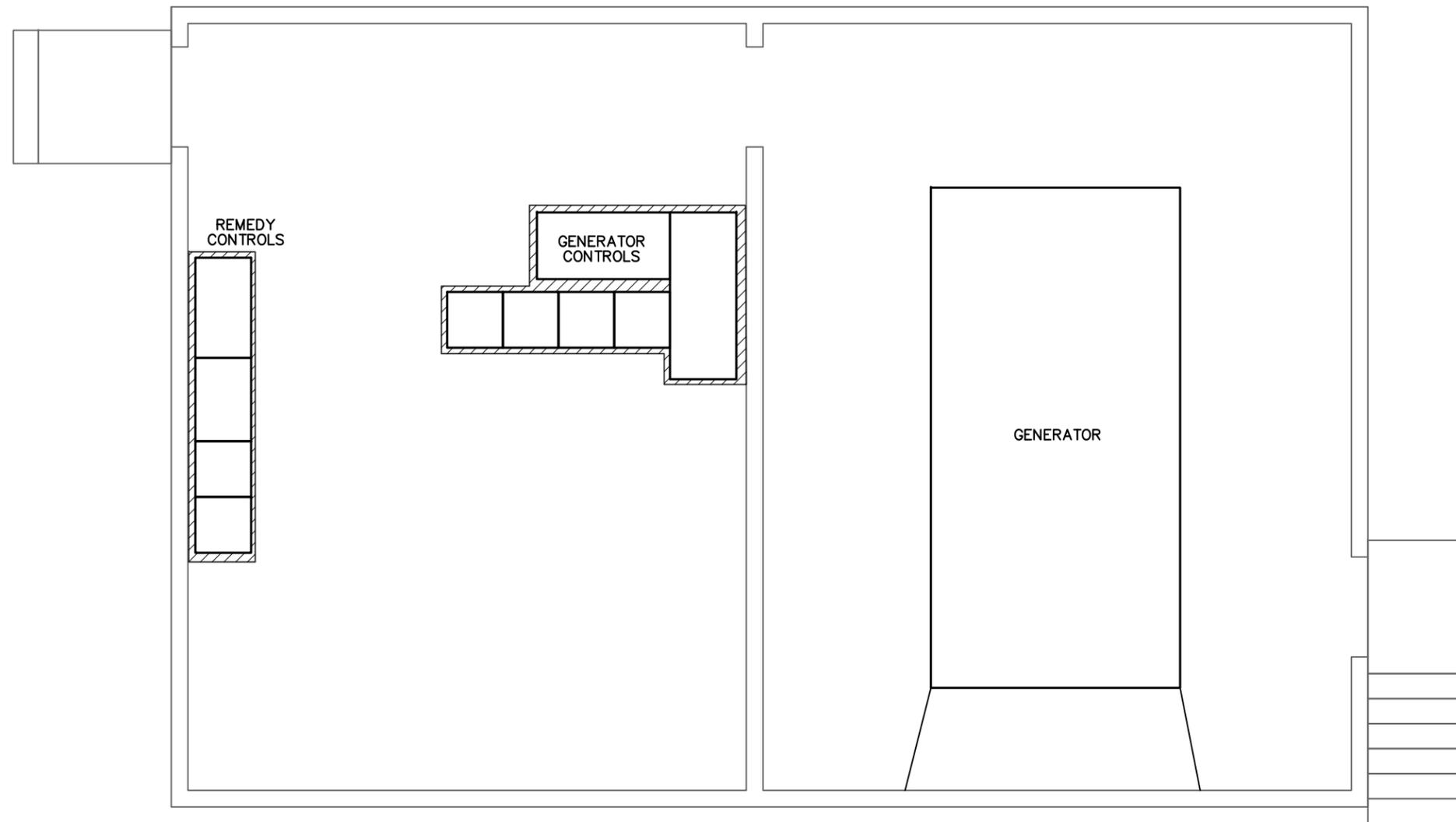
TOPOCK GROUNDWATER REMEDIATION PROJECT
SCADA NETWORK DIAGRAM

PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA



JCN	AREA	COUNTY	PROFILE
SHEET NO.	OF	DRAWING NUMBER	CHANGE
E-11			





ELECTRICAL BUILDING
SCALE: 1/2" = 1'

DATUM: HORIZONTAL:	PROJECTION:	NOV 2011 PRELIMINARY PLANS
VERTICAL:	UNITS:	
REFERENCE DWGS:		
NO.	DATE	DESCRIPTION
APPRD. NO.	DATE	DESCRIPTION
APPRD. NO.	DATE	DESCRIPTION
APPRD. NO.	DATE	DESCRIPTION
APPRD. NO.	DATE	DESCRIPTION

SCALES:	
1 inch =	
1 centimeter =	

APPRD. BY	AUTHORIZATION
BY THOMAS FRISCH	
DR BRIAN WOODIN	
CH THOMAS FRISCH	
D.O.K.	
DATE	

TOPOCK GROUNDWATER REMEDIATION
ELECTRICAL BUILDING PLAN
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA



JCN	AREA	COUNTY	PROFILE
SHEET NO.	DRAWING NUMBER	OF	CHANGE
	E-21		

FOLD

FOLD

FOLD

FOLD

10
9
8
7
6
5
4
3
2
1
0
CENTIMETERS

5
4
3
2
1
0
INCHES

P&ID ABBREVIATIONS				
INSTRUMENTATION SYMBOLS				
FIRST LETTER	MEASURED OR INITIATING VARIABLE	MODIFIER	SUCCESSING LETTERS	MODIFIER
			READOUT PASSIVE FUNCTION	OUTPUT FUNCTION
A	ANALYSIS		ALARM	USER'S CHOICE
B	BURNER, COMBUSTION		USER'S CHOICE	USER'S CHOICE
C	CONDUCTIVITY			CONTROLLER
D	DENSITY	DIFFERENTIAL		
E	VOLTAGE		SENSOR, PRIMARY ELEMENT	
F	FLOW	RATIO		
G	GENERAL		GLASS VIEWING DEVICE	
H	HAND			HIGH, OPENED
I	CURRENT		INDICATING, INDICATOR	
J	POWER	SCAN		
K	TIME, TIME SCHEDULED	TIME RATE OF CHANGE		CONTROL STATION
L	LEVEL		LIGHT	LOW, CLOSED
M	MOISTURE	MOMENTARY		MIDDLE
N	STATUS		STATUS	USER'S CHOICE
O	OPERATOR		ORIFICE, RESTRICTION	USER'S CHOICE
P	PRESSURE, VACUUM		POINT (TEST) CONNECTION	
Q	QUANTITY	INTEGRATE, TOTALIZE		
R	RESET		RECORD	
S	SPEED, FREQUENCY	SAFETY		SWITCH
T	TEMPERATURE			TEST
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION
V	VIBRATION			VAVE, DAMPER, LOUVER
W	WEIGHT		WELL	
X	SWITCH	X AXIS	UNCLASSIFIED	UNCLASSIFIED
Y	EVENT, STATE OF PRESENCE	Y AXIS		RELAY, COMPUTER, CONVERTER
Z	POSITION, DIMENSION	Z AXIS		DRIVER, ACTUATOR, UNCLASSIFIED FINAL CONTROL ELEMENT

P&ID ABBREVIATIONS			
SWITCH IDENTIFIER			
F/R	FORWARD/REVERSE	S/D	SHUTDOWN
HOA	HAND-OFF-AUTO	SEL	SELECTOR
HOR	HAND-OFF-REMOTE	S/S	START / STOP
LOS	LOCK OUT STOP	%	PERCENT ADJUSTMENT
MOA	MANUAL-OFF-AUTO		
OCA	OPEN-CLOSE-AUTO		
O/C	OPEN / CLOSE		
O/O	ON / OFF		
O/R	OVERRIDE		

P&ID SYMBOLS							
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
ISA SYMBOLS				PUMPS			
	FIELD MOUNTED INSTRUMENT		GATE VALVE		CENTRIFUGAL PUMP OR BLOWER		PIPE REDUCER
	INSTRUMENT MOUNTED ON DOOR OF LOCAL PANEL, OPERATOR ACCESSIBLE		CHECK VALVE		SUBMERSIBLE SEWAGE PUMP		RUPTURE DISC
	INSTRUMENT MOUNTED ON DOOR OF FIELD PANEL, OPERATOR ACCESSIBLE		PLUG VALVE		VERTICAL TURBINE PUMP OR WELL PUMP		PRESSURE OR VACUUM RELIEF VALVE
	INSTRUMENT MOUNTED WITHIN PANEL, OPERATOR INACCESSIBLE		BALL VALVE		SUBMERSIBLE WELL PUMP		DIAPHRAGM SEAL
	INSTRUMENT MOUNTED WITHIN FIELD PANEL, OPERATOR INACCESSIBLE		BALL CHECK VALVE		GEAR PUMP		ANNUAL SEAL
	OPERATION PERFORMED WITH LOGIC OR HARDWIRED DEVICES		BUTTERFLY VALVE		POSITIVE DISPLACEMENT PUMP OR BLOWER		MIXER
	ASSOCIATED MOTOR CONTROL ELEMENTARY IF APPLICABLE		RELIEF VALVE		DIAPHRAGM PUMP		FILTER
	VISUAL DISPLAY OF PLC ANALOG REGISTER SCALE TO UNITS AS SHOWN		DIAPHRAGM VALVE		PERISTALTIC PUMP		VENT W/CAP OR SCREEN
	VISUAL DISPLAY OF PLC ANALOG ALARM REGISTER		3-WAY VALVE		MOTOR		FLEXIBLE HOSE OR TUBING
	VISUAL DISPLAY OF PLC DIGITAL REGISTER		FLOW CONTROL VALVE	SENSORS			
	VISUAL DISPLAY OF PLC DIGITAL ALARM REGISTER		SOLENOID VALVE (2-WAY) (S->M FOR MOTORIZED VALVE)		ORIFICE PLATE		EJECTOR / EDUCTOR
	TAG DESCRIPTION		SOLENOID VALVE (3-WAY) (S->M FOR MOTORIZED VALVE)		MAGNETIC FLOWMETER		HOSE COUPLING
	PLC I/O TAG		SOLENOID VALVE (4-WAY) (S->M FOR MOTORIZED VALVE)		DENSITY METER		PULSATION DAMPENERS
	PLC DIGITAL INPUT		PNEUMATIC DIAPHRAGM CONTROL VALVE		ULTRASONIC FLOWMETER		OMNI ANTENNA NON-DIRECTIONAL
	PLC DIGITAL OUTPUT		PRESSURE SUSTAINING VALVE		TURBINE OR PROPELLER METER		YAGI ANTENNA DIRECTIONAL
	ANALOG INPUT		PRESSURE REGULATING VALVE		VENTURI TUBE		
	ANALOG OUTPUT		MULTIFUNCTION VALVE		THERMAL DISPERSION FLOWMETER OR SWITCH		
	AUDIBLE ALARM (BUZZER OR HORN)		SLUICE GATE (SG) OR SLIDE GATE (SLG)				
	LAMP INDICATION COLOR DENOTED BY "X" RED, BLU, GRN, WHT, AMBR		AIR RELIEF VALVE (ARV)				
	CONTINUATION TAG FROM ONE AREA TO ANOTHER AREA OF DIFFERENT DRAWINGS "o" TAG IDENTIFIER TO POINT ON DRAWING NUMBER XXXX.		FLOAT VALVE		ULTRASONIC LEVEL TRANSMITTER (FLOW IF OVER FLUME OR WEIR)		
	CONTINUED ON DWG I-X		STRAINER		CONDUCTANCE TYPE LEVEL ELEMENTS		
LINE TYPES				ACTUATORS			
	PRIMARY PROCESS LINE		MOTORIZED SOLENOID				
	SECONDARY PROCESS LINE		PNEUMATIC OPERATOR S- SOLENOID - OPEN/CLOSE A- POSITIONER - MODULATING				
	ELECTRICAL SIGNAL LINE (DIGITAL OR ANALOG)						
	SOFTWARE OR DATA LINK						
	BOUNDARY OF EQUIPMENT PACKAGE SYSTEM						
	COMMUNICATION CONNECTION						

DATUM: HORIZONTAL: _____ PROJECTION: _____

VERTICAL: _____ UNITS: _____

REFERENCE DWGS: _____

NOV 2011 PRELIMINARY PLANS

NO. DATE DESCRIPTION APPD. NO. DATE DESCRIPTION APPD. NO. DATE DESCRIPTION APPD.

SCALES: 1 inch = _____ 1 centimeter = _____

REVISIONS

APPRD BY _____ AUTHORIZATION _____

BY THOMAS FRISCH
DR BRIAN WOODIN
CH THOMAS FRISCH
O,K,
DATE _____

TOPOCK GROUNDWATER REMEDIATION
INSTRUMENTATION SYMBOLS
AND ABBREVIATIONS

PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA



JCN _____ AREA _____ COUNTY _____ PROFILE _____

SHEET NO. _____ OF _____

DRAWING NUMBER _____ CHANGE _____

I-1

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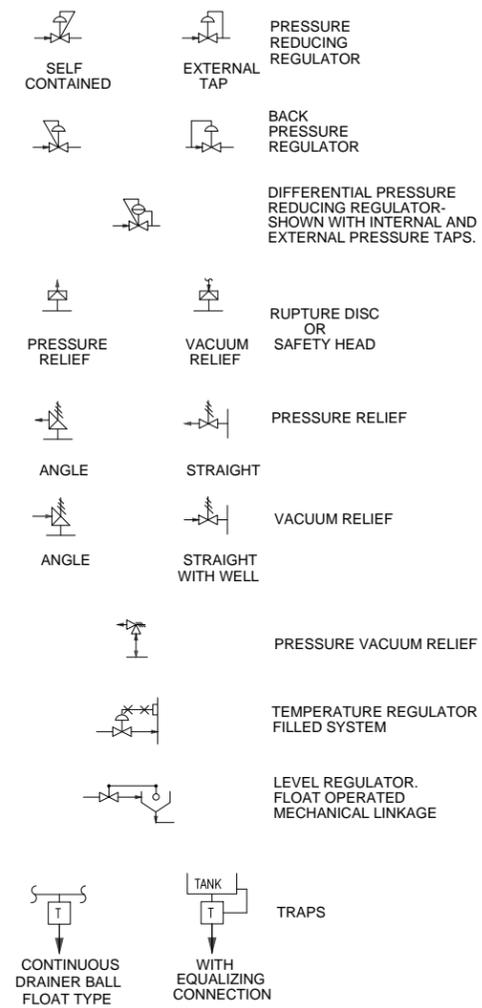
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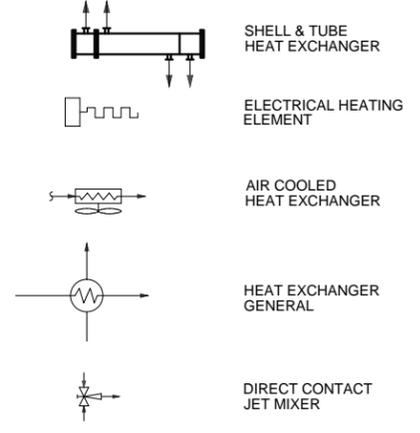
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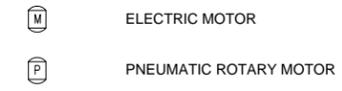
SYMBOLS FOR SELF-ACTUATED REGULATORS



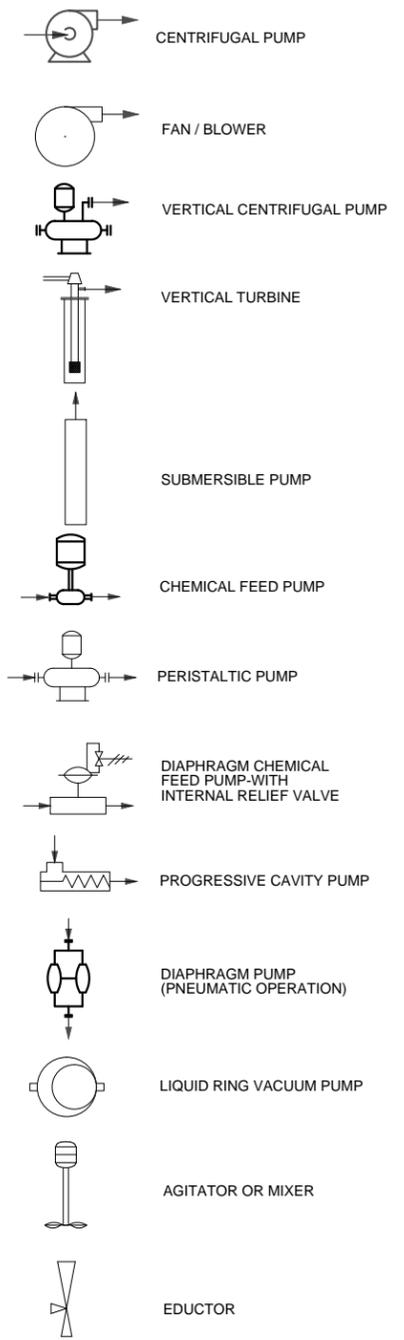
HEAT EXCHANGER SYMBOLS



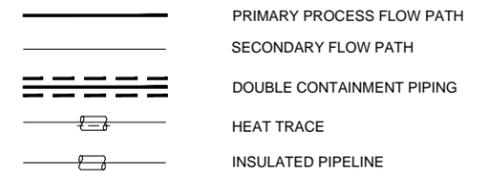
PRIME MOVERS FOR MOTOR DRIVEN EQUIPMENT



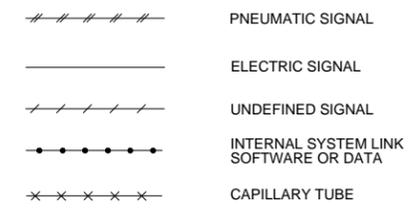
MOTOR DRIVEN EQUIPMENT



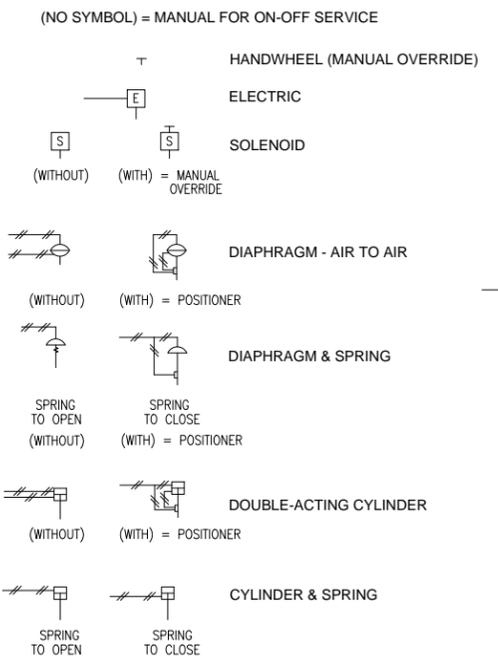
PIPING SYMBOLS



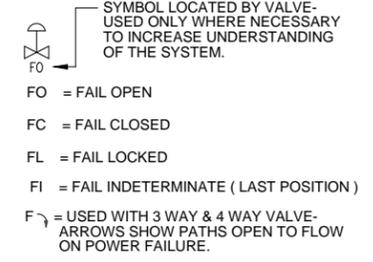
INSTRUMENT LINE SYMBOLS



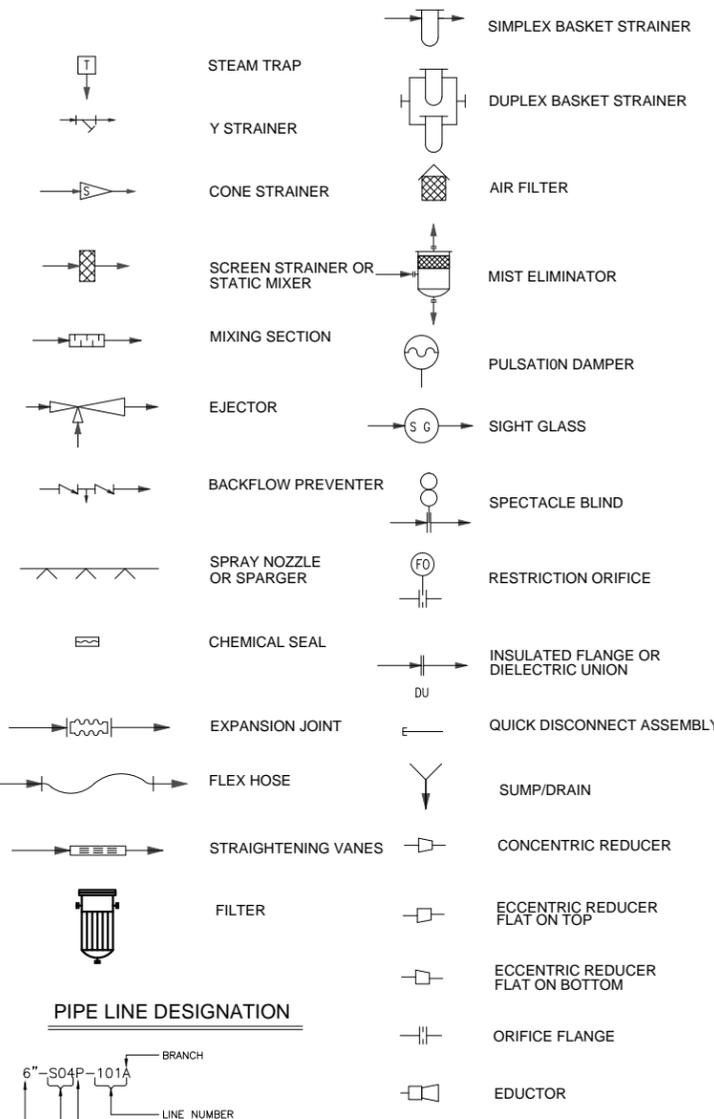
VALVE ACTUATOR SYMBOLS



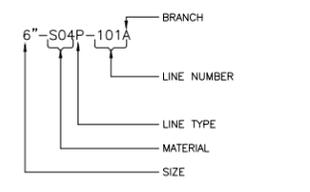
SYMBOLS FOR VALVE ACTION IN THE EVENT OF ACTUATOR POWER FAILURE.



PIPING ACCESSORIES AND DETAILS



PIPE LINE DESIGNATION



MATERIAL

BRZ - BRASS/BRONZE	PET - POLYETHYLENE	VIT - VITON
CIR - CAST IRON	POP - POLYPROPYLENE	
CST - CARBON STEEL	PVC - POLYVINYL CHLORIDE	
CPR - COPPER	RUB - RUBBER	
CVC - CHLORINATED POLYVINYL CHLORIDE	S04 - 304 STAINLESS STEEL	
DIR - DUCTILE IRON	S4L - 304L STAINLESS STEEL	
FRP - FIBERGLASS	S16 - 316 STAINLESS STEEL	
GCS - GALVANIZED CARBON STEEL	S6L - 316L STAINLESS STEEL	
LCS - LINED CARBON STEEL	TEF - TEFLON	

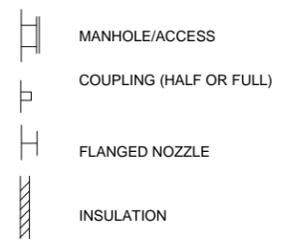
TYPE

D = DUCT P = PIPE
H = HOSE T = TUBE

VALVE SYMBOLS



TANK ACCESSORIES



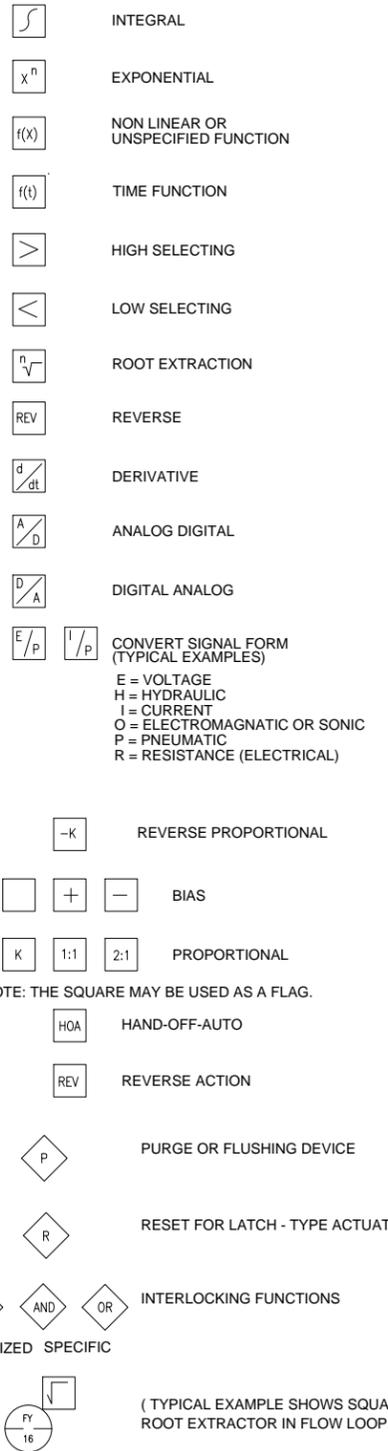
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1. THIS DRAWING IS PROVIDED FOR REFERENCE ONLY.

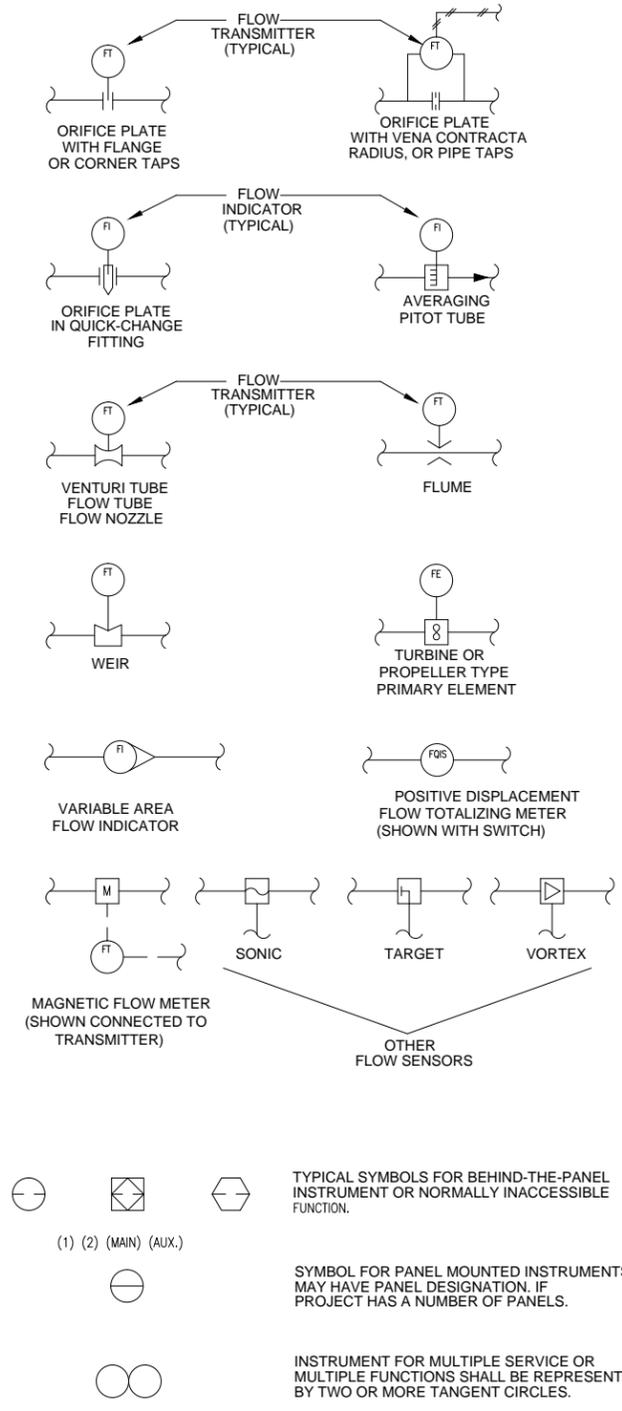
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SCALES: 1 inch = _____ 1 centimeter = _____		REVISIONS		NO. _____	DATE _____	DESCRIPTION _____
BY: PC CH: PC O.K.: PT DATE: _____		TOPOCK GROUNDWATER REMEDIATION PROJECT		PIPING AND INSTRUMENTATION DIAGRAM		LEGEND #1
PACIFIC GAS AND ELECTRIC COMPANY		SAN FRANCISCO, CALIFORNIA		PG&E LS & ES		JCN: _____ AREA: _____ COUNTY: _____ PROFILE: _____ SHEET NO. _____ OF _____ DRAWING NUMBER: I-2

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MISCELLANEOUS SYMBOLS



SYMBOLS FOR FLOW MEASUREMENT



INSTRUMENT IDENTIFICATION LETTERS

FIRST LETTER		SUCCEEDING LETTERS		
MEASURE OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A = ANALYSIS		ALARM		
B = BURNER, COMBUSTION		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
C = USER'S CHOICE			CONTROL	
D = USER'S CHOICE	DIFFERENTIAL			
E = VOLTAGE		SENSOR (PRIMARY ELEMENT)		
F = FLOW RATE	RATIO (FRACTION)			
G = USER'S CHOICE		GLASS, VIEWING DEVICE		
H = HAND				HIGH
I = CURRENT (ELECTRICAL)		INDICATE		
J = POWER	SCAN			
K = TIME, TIME SCHEDULE	TIME RATE OF CHANGE		CONTROL STATION	
L = LEVEL		LIGHT		LOW
M = USER'S CHOICE	MOMENTARY			MIDDLE, INTERMEDIATE
N = USER'S CHOICE		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
O = USER'S CHOICE		ORIFICE, RESTRICTION		
P = PRESSURE, VACUUM		POINT (TEST) CONNECTION		
Q = QUANTITY	INTERGRATE, TOTALIZE			
R = RADIATION		RECORD		
S = SPEED, FREQUENCY	SAFETY		SWITCH	
T = TEMPERATURE			TRANSMIT	
U = MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V = VIBRATION, MECH. ANALYSIS			VALVE, DAMPER, LOUVER	
W = WEIGHT, FORCE		WELL		
X = UNCLASSIFIED	X AXIS	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED
Y = EVENT. STATE OR PRESENCE	Y AXIS		RELAY, COMPUTE, CONVERT	
Z = POSITION, DIMENSION	Z AXIS		DRIVE, ACTUATOR, UNCLASSIFIED FINAL CONTROL ELEMENT	

INSTRUMENT SYMBOLS

	PRIMARY CONTROL PANEL NORMALLY ACCESSIBLE TO OPERATOR	FIELD MOUNTED	AUXILIARY PANEL OR RACK NORMALLY ACCESSIBLE TO OPERATOR
DISCRETE INSTRUMENTS			
SHARED DISPLAY, SHARED CONTROL			
COMPUTER FUNCTION INCLUDING DISTRIB. CNTL. SYS.			
PROGRAMMABLE LOGIC CONTROLLER FUNCTION			

NOTES:

- ANY FIRST LETTER COMBINED WITH MODIFIER REPRESENTS A NEW AND SEPARATE MEASURED VARIABLE. EXAMPLES: PD = DIFFERENTIAL PRESSURE FQ = TOTALIZED OR INTEGRATED FLOW. EXCEPTION IS THE MODIFIER "J" FOR MULTIPOINT SCANNING.
- FOR ANALYSIS NOT IDENTIFIED BY A SPECIFIC LETTER IN THE TABLE, USE FIRST LETTER "A" NEAR THE INSTRUMENT SYMBOL. SPECIFY THE NATURE OF THE ANALYSIS. EXAMPLE: PH MEANING OF A "USER CHOICE" LETTER SHALL BE CONSISTENT THROUGHOUT A PROJECT, AND SHALL BE SPECIFIED IN THE DRAWING LEGEND.
- UNCLASSIFIED LETTER MAY HAVE A FEW DIFFERENT MEANINGS ON A PROJECT. THE MEANING SHALL BE SPECIFIED NEAR EACH INSTRUMENT SYMBOL USING THE UNCLASSIFIED LETTER.
- THE MODIFIER "SCAN" APPLIES TO MULTIPOINT PRINTING INSTRUMENTS, SUCH AS CJRS (MULTIPOINT CONDUCTIVITY RECORDER WITH ALARM SWITCHES).

GENERAL NOTES:

- THIS DRAWING IS PROVIDED FOR REFERENCE ONLY.

DATUM: HORIZONTAL: _____		PROJECTION: _____		NOV 2011 PRELIMINARY PLANS - NOT FOR CONSTRUCTION		APPRD BY: _____		AUTHORIZATION: _____	
VERTICAL: _____		UNITS: _____							
REFERENCE DWGS:				NO. DATE DESCRIPTION				BY: PC	
SCALES: 1 inch = _____				APPRD. NO. DATE DESCRIPTION				CH: PC	
				REVISIONS				O.K. PT	
								DATE	

TOPOCK GROUNDWATER REMEDIATION PROJECT

PIPING AND INSTRUMENTATION DIAGRAM

LEGEND #2

PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

JCN: _____
 AREA: _____
 COUNTY: _____
 PROFILE: _____
 SHEET NO. OF: _____
 DRAWING NUMBER: I-3
 CHANGE: _____

SCADA DISPLAY

SCADA DISPLAY

PLC

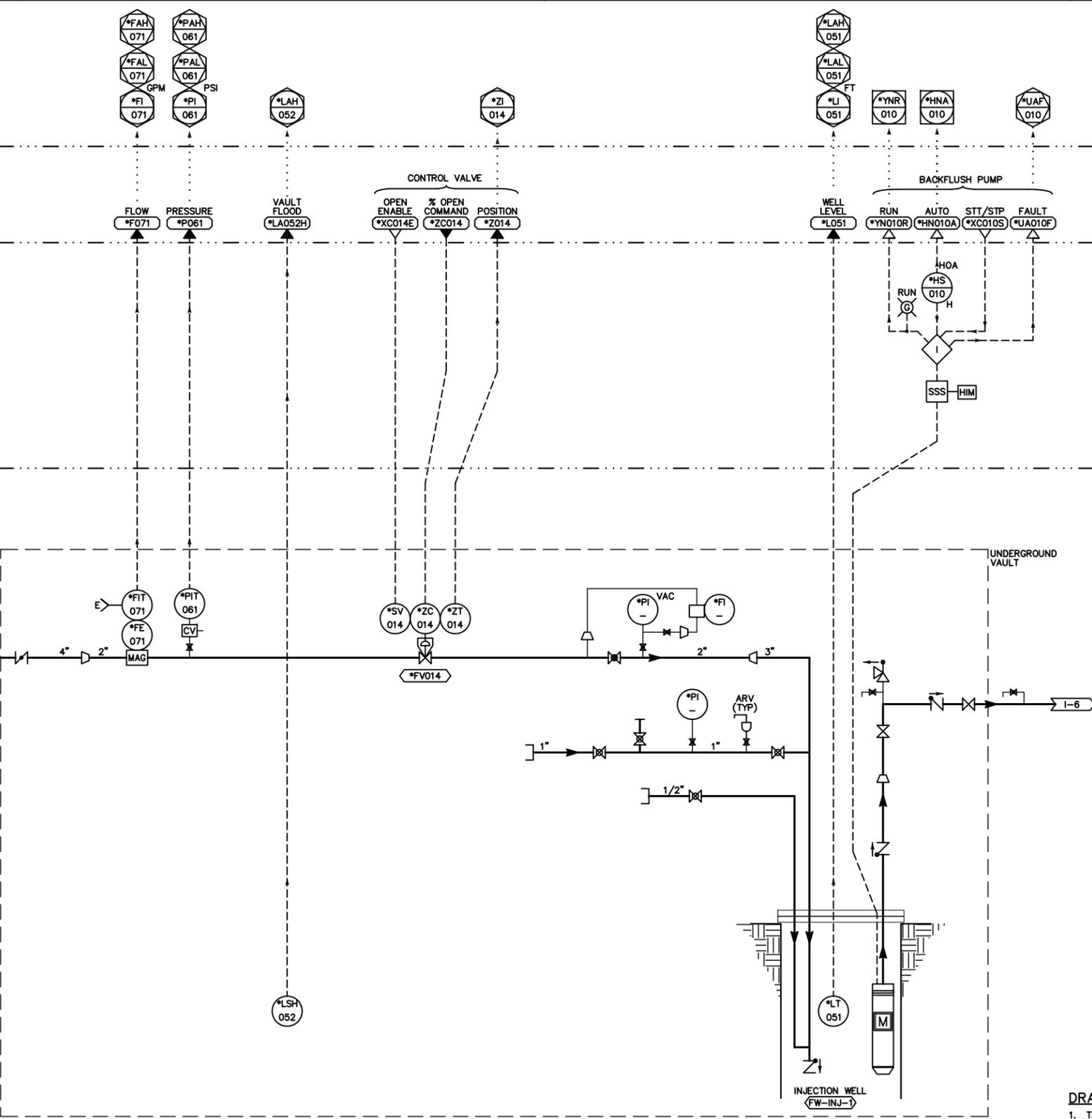
PLC

CONTROL PANEL

CONTROL PANEL

FIELD

FIELD



- DRAWING NOTES:**
1. TAG NUMBER "*" IS A PLACEHOLDER FOR THE STATION SCADA ID. THE LOCATION ID FOR THIS PROJECT IS FWI01-. EXCHANGE FWI01- FOR "*" TO COMPLETE TAG OR INSTRUMENT REFERENCE.
 2. DRAWING TYPICAL FOR FW-INJ-2, FW-INJ-4.

DATUM: HORIZONTAL:	PROJECTION:	NOV 2011 PRELIMINARY PLANS
VERTICAL:	UNITS:	
REFERENCE DWGS:		
SCALES: 1 inch =		
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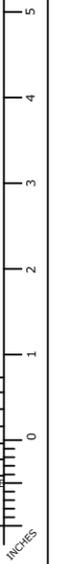
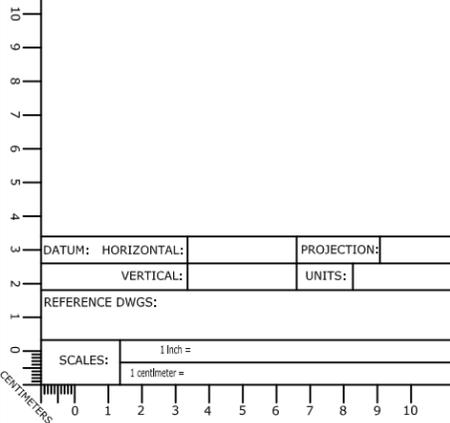
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REVISIONS									

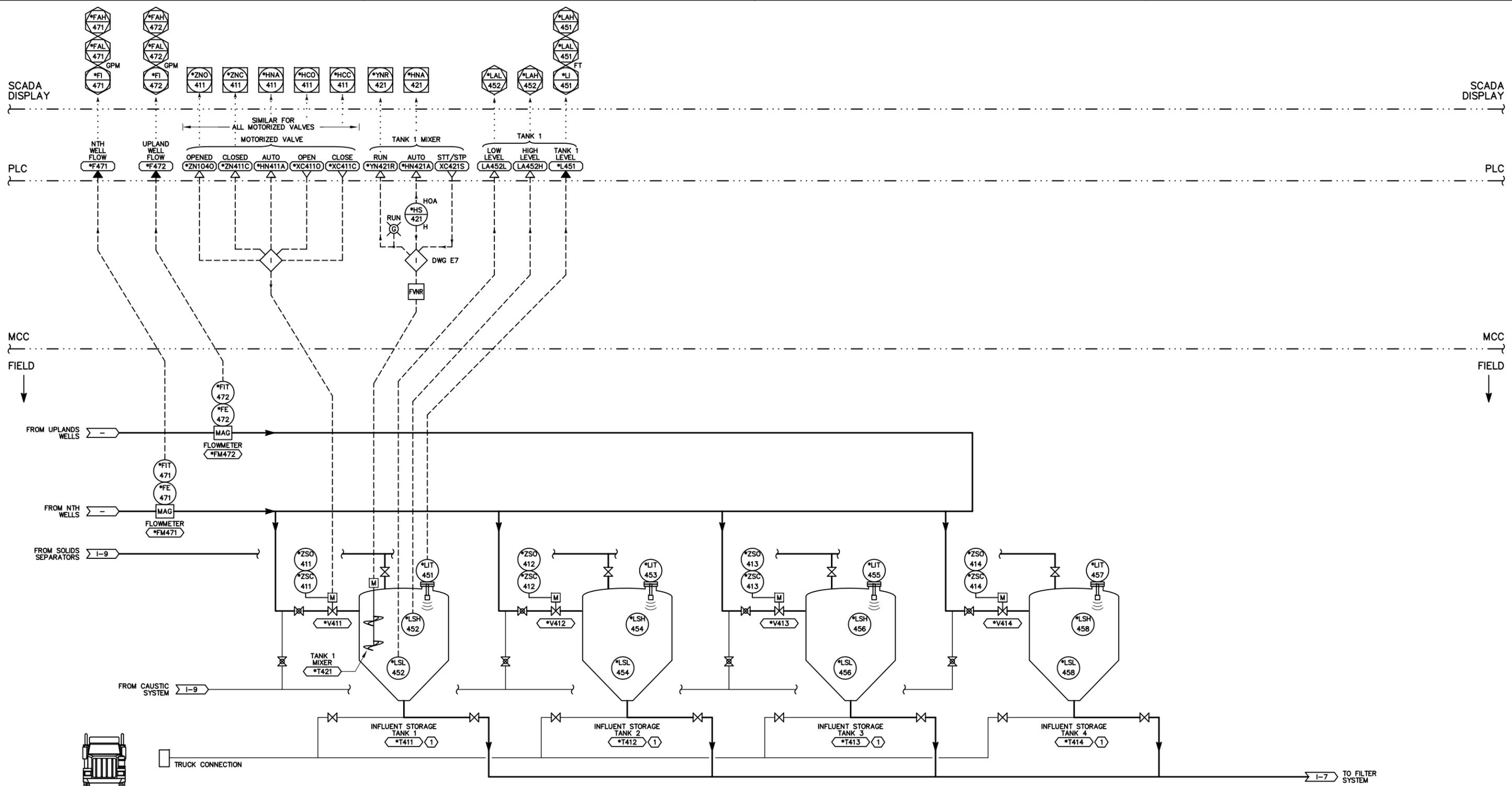
APPRD BY	AUTHORIZATION
BY THOMAS FRISCH DR BRIAN WOODIN CH THOMAS FRISCH O,K, DATE	

TOPOCK GROUNDWATER REMEDIATION
INJECTION WELL P&ID
PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA



JCN	AREA	COUNTY	PROFILE
SHEET NO.	OF	DRAWING NUMBER	CHANGE
		I-4	





REMEDY PRODUCED WATER TANKS

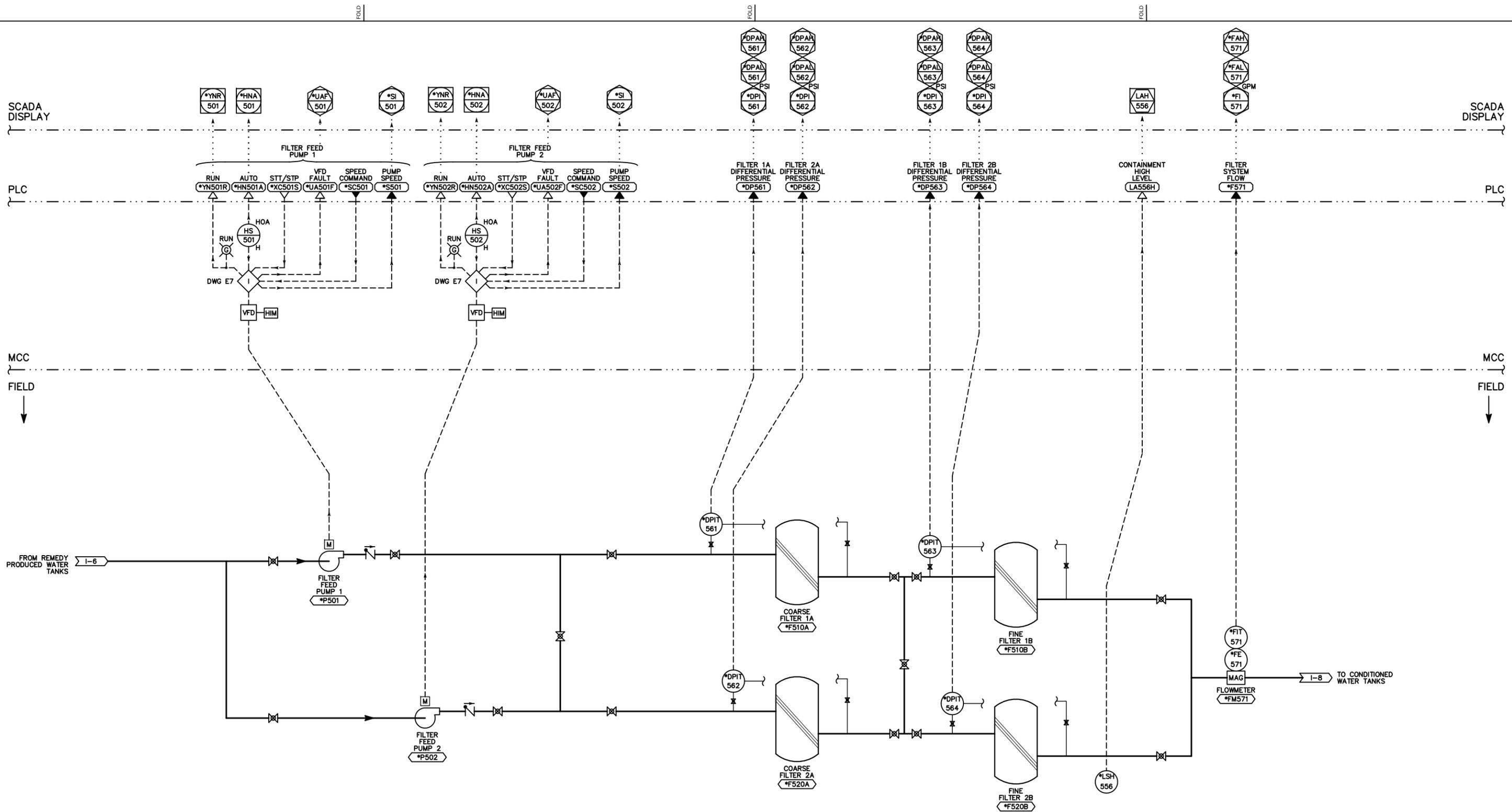
DRAWING NOTES:
 1. TAG NUMBER "*" IS A PLACEHOLDER FOR THE STATION SCADA ID. THE LOCATION ID FOR THIS PROJECT IS RWTP-. EXCHANGE RWTP- FOR "*" TO COMPLETE TAG OR INSTRUMENT REFERENCE.

NOTES REFERENCED IN DRAWING:
 (1) TANKS TO HAVE SECONDARY CONTAINMENT.

DATUM: HORIZONTAL:		PROJECTION:		NOV 2011 PRELIMINARY PLANS										APPD BY	AUTHORIZATION						
VERTICAL:		UNITS:																			
REFERENCE DWGS:														BY THOMAS FRISCH DR BRIAN WOODIN CH THOMAS FRISCH O,K, DATE		TOPOCK GROUNDWATER REMEDIATION REMEDY PRODUCED WATER TANK P&ID				JCN	
SCALES: 1 inch = _____ 1 centimeter = _____																				SHEET NO. OF	
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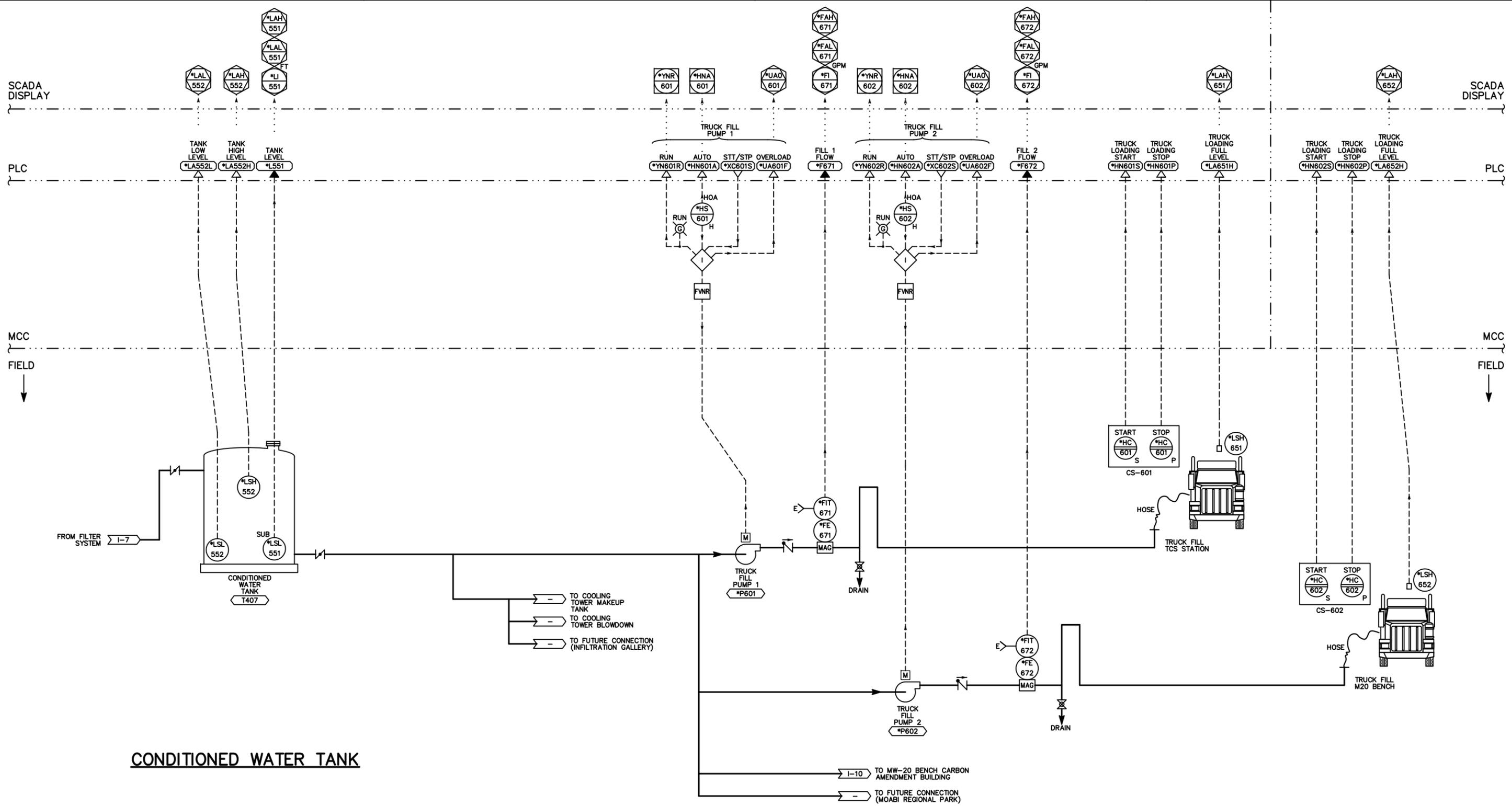


FILTER SYSTEM

DRAWING NOTES:
 1. TAG NUMBER "*" IS A PLACEHOLDER FOR THE STATION SCADA ID. THE LOCATION ID FOR THIS PROJECT IS RWTP-. EXCHANGE RWTP- FOR "*" TO COMPLETE TAG OR INSTRUMENT REFERENCE.

NOTES REFERENCED IN DRAWING:
 (1) FILTER SYSTEM TO HAVE SECONDARY CONTAINMENT.

DATUM: HORIZONTAL:		PROJECTION:		NOV 2011 PRELIMINARY PLANS		APPRD BY:		AUTHORIZATION:	
VERTICAL:		UNITS:						BY THOMAS FRISCH DR BRIAN WOODIN CH THOMAS FRISCH	
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								TOPOCK GROUNDWATER REMEDIATION FILTER SYSTEM P&ID	
								PACIFIC GAS AND ELECTRIC COMPANY SAN FRANCISCO, CALIFORNIA	
								JCN _____ AREA _____ COUNTY _____ PROFILE _____ SHEET NO. _____ OF _____ DRAWING NUMBER _____ CHANGE _____	



CONDITIONED WATER TANK

CONDITIONED WATER DISTRIBUTION

DRAWING NOTES:
 1. TAG NUMBER "*" IS A PLACEHOLDER FOR THE STATION SCADA ID. THE LOCATION ID FOR THIS PROJECT IS RWTP-. EXCHANGE RWTP- FOR "*" TO COMPLETE TAG OR INSTRUMENT REFERENCE.

DATUM: HORIZONTAL:	PROJECTION:	NOV 2011 PRELIMINARY PLANS
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REFERENCE DWGS:		
SCALES: 1 inch =		
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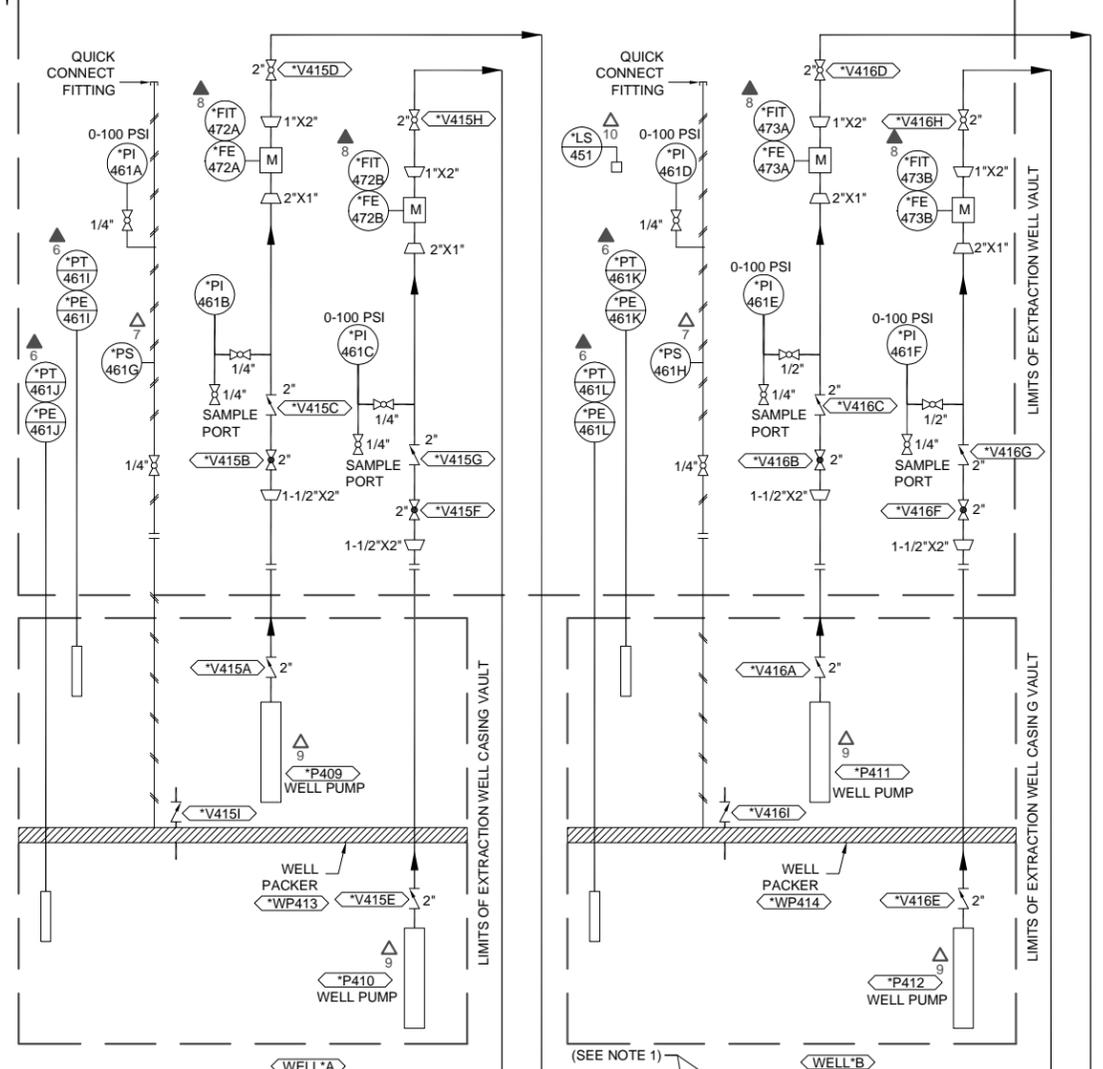
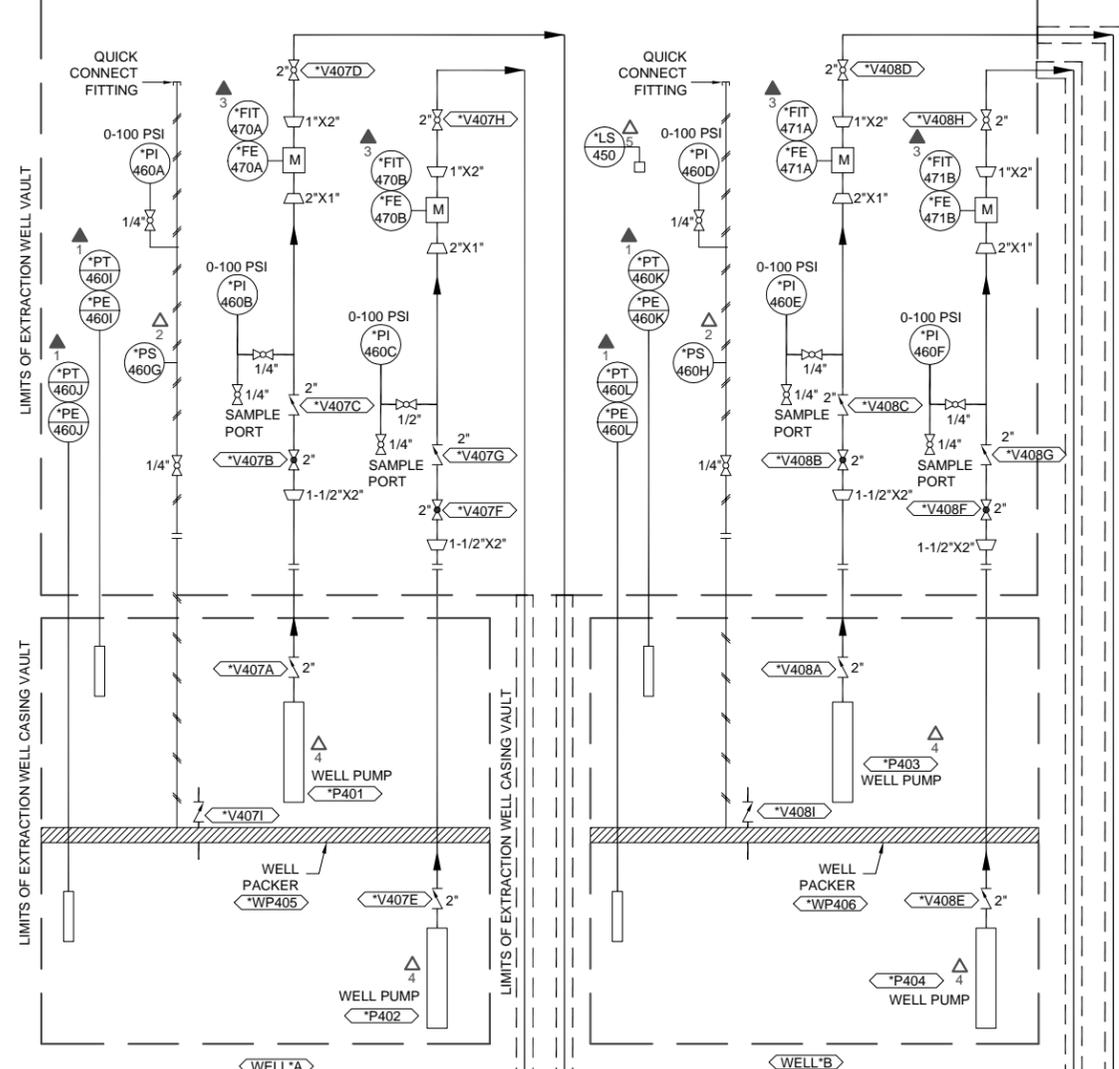
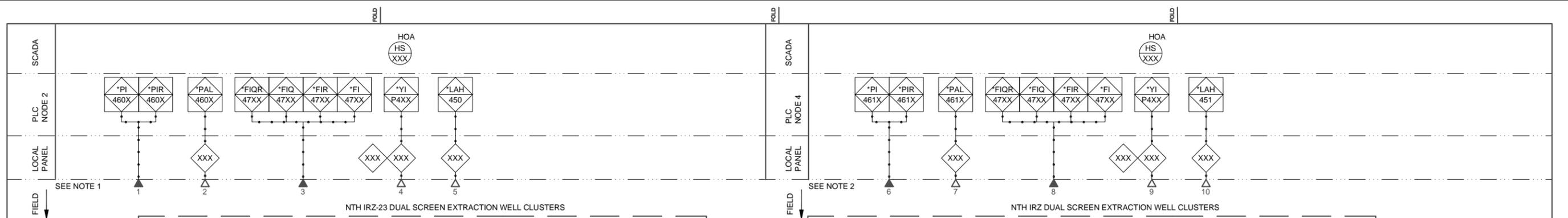
APPRD BY	AUTHORIZATION
BY THOMAS FRISCH DR BRIAN WOODIN CH THOMAS FRISCH O.K. DATE	

TOPOCK GROUNDWATER REMEDIATION
 CONDITIONED WATER P&ID
 PACIFIC GAS AND ELECTRIC COMPANY
 SAN FRANCISCO, CALIFORNIA



JCN	AREA	COUNTY	PROFILE
SHEET NO.	OF	DRAWING NUMBER	CHANGE
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- NOTES**
- EXTRACTION WELL CONNECTIONS FOR FUTURE PROVISIONAL EXTRACTION WELLS. SEE CIVIL SHEETS FOR LOCATIONS.
 - SIMILAR FOR EACH INTERVAL.
 - TAG NUMBER *** IS A PLACEHOLDER FOR THE STATION SCADA ID. THE LOCATION ID FOR THE NTH IRZ-23 EXTRACTION WELL IS "IRZ23-". FOR THE NORTHERN NTH IRZ EXTRACTION WELLS THE LOCATION IS "IRZXX-". EXCHANGE "IRZ23- OR "IRZXX-" FOR *** TO COMPLETE TAG OR INSTRUMENT REFERENCE. REFER TO SHEET I-15A FOR A TABLE OF LOCATION IDS.
 - SEE SHEET I-15A FOR INTERLOCK TABLE.

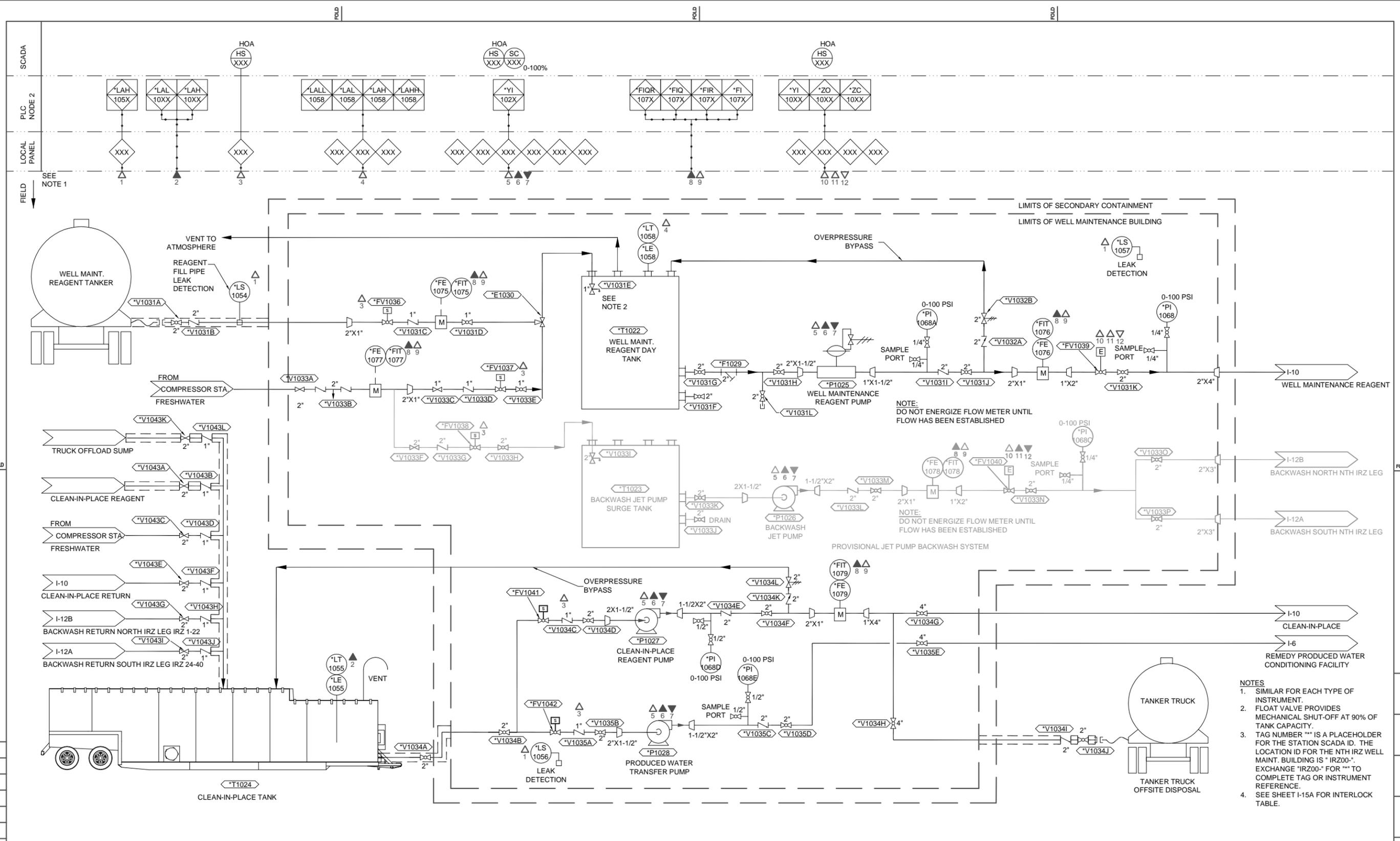
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SCALES: 1 inch =									
1 centimeter =									
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TOPOCK GROUNDWATER REMEDIATION PROJECT
NTH IRZ EXTRACTION WELLS P&ID

PACIFIC GAS AND ELECTRIC COMPANY
 SAN FRANCISCO, CALIFORNIA

JCN
 AREA
 COUNTY
 PROFILE
 SHEET NO. OF
 DRAWING NUMBER OF CHANGE
 I-9

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- NOTES**
1. SIMILAR FOR EACH TYPE OF INSTRUMENT.
 2. FLOAT VALVE PROVIDES MECHANICAL SHUT-OFF AT 90% OF TANK CAPACITY.
 3. TAG NUMBER "XX" IS A PLACEHOLDER FOR THE STATION SCADA ID. THE LOCATION ID FOR THE NTH IRZ WELL MAINT. BUILDING IS "IRZ00-". EXCHANGE "IRZ00-" FOR "XX" TO COMPLETE TAG OR INSTRUMENT REFERENCE.
 4. SEE SHEET I-15A FOR INTERLOCK TABLE.

DATUM: HORIZONTAL:		PROJECTION:		NOV 2011 PRELIMINARY PLANS - NOT FOR CONSTRUCTION		APPR BY:		AUTHORIZATION:	
VERTICAL:		UNITS:				BY: KD		DR: SS	
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SCALES: 1 inch =		1 centimeter =		REVISIONS					

TOPOCK GROUNDWATER REMEDIATION PROJECT
NTH IRZ WELL MAINTENANCE BUILDING P&ID

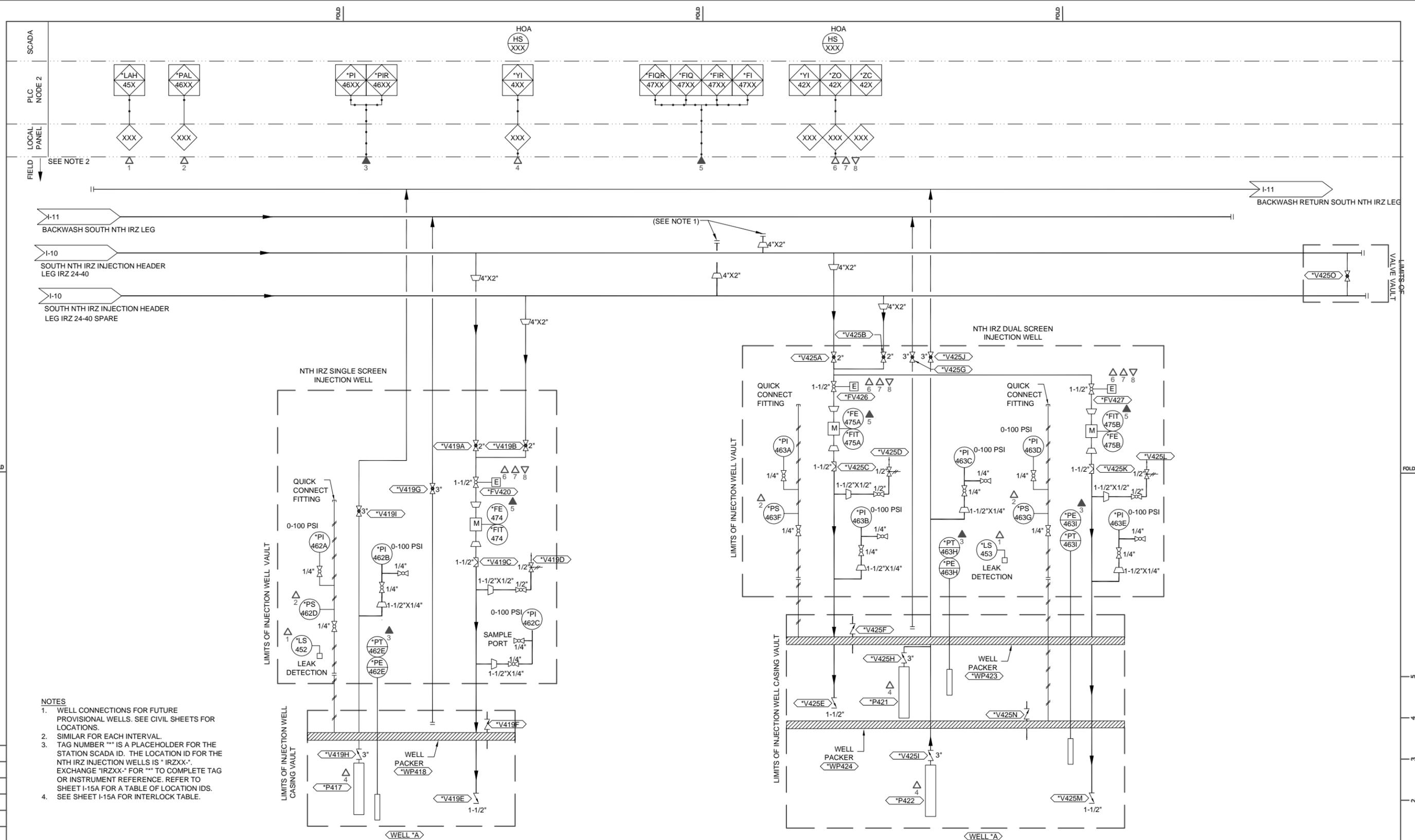
PACIFIC GAS AND ELECTRIC COMPANY
 SAN FRANCISCO, CALIFORNIA

JCN: _____
 AREA: _____
 COUNTY: _____
 PROFILE: _____

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- NOTES**
1. WELL CONNECTIONS FOR FUTURE PROVISIONAL WELLS. SEE CIVIL SHEETS FOR LOCATIONS.
 2. SIMILAR FOR EACH INTERVAL.
 3. TAG NUMBER "*" IS A PLACEHOLDER FOR THE STATION SCADA ID. THE LOCATION ID FOR THE NTH IRZ INJECTION WELLS IS "IRZXX-". EXCHANGE "IRZXX-" FOR "*" TO COMPLETE TAG OR INSTRUMENT REFERENCE. REFER TO SHEET I-15A FOR A TABLE OF LOCATION IDS.
 4. SEE SHEET I-15A FOR INTERLOCK TABLE.

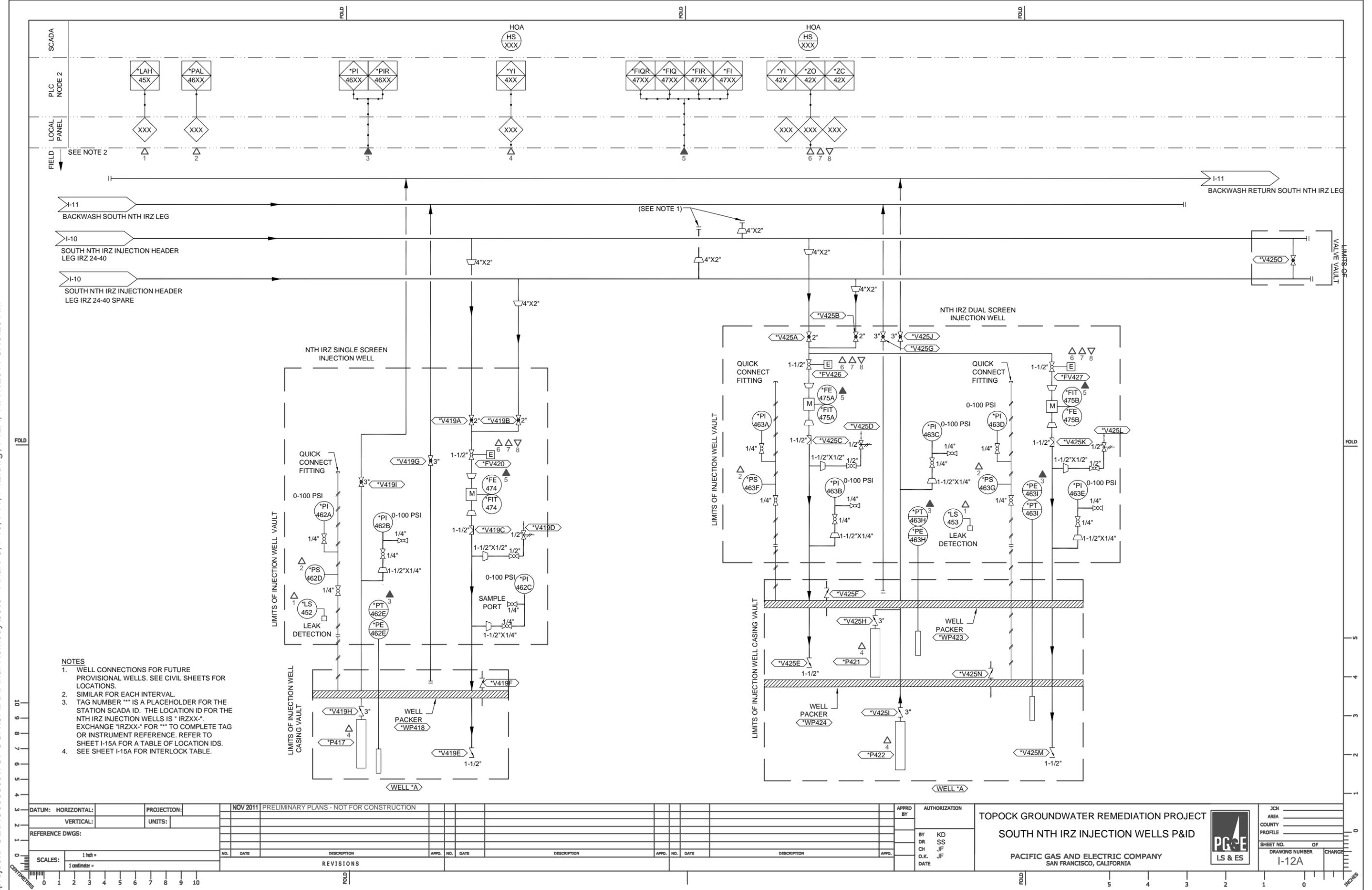
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SCALES: 1 inch =				NO. DATE DESCRIPTION		APPRD. NO. DATE DESCRIPTION		APPRD. NO. DATE DESCRIPTION	
1 centimeter =				REVISIONS					

TOPOCK GROUNDWATER REMEDIATION PROJECT
SOUTH NTH IRZ INJECTION WELLS P&ID

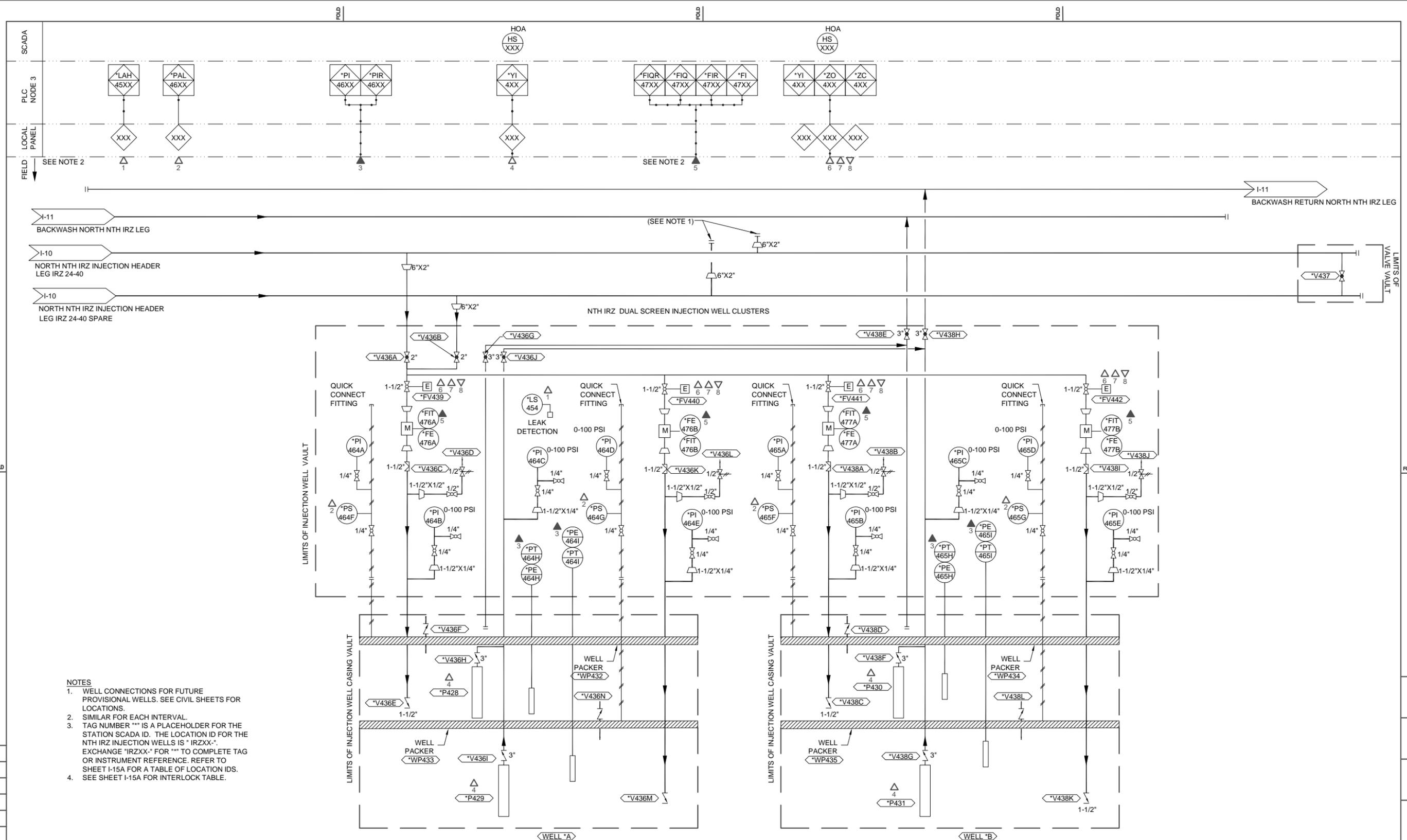
PACIFIC GAS AND ELECTRIC COMPANY
 SAN FRANCISCO, CALIFORNIA



JCN	AREA	COUNTY	PROFILE
SHEET NO.	DRAWING NUMBER	OF	CHANGE
	I-12A		



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- NOTES**
1. WELL CONNECTIONS FOR FUTURE PROVISIONAL WELLS. SEE CIVIL SHEETS FOR LOCATIONS.
 2. SIMILAR FOR EACH INTERVAL.
 3. TAG NUMBER "***" IS A PLACEHOLDER FOR THE STATION SCADA ID. THE LOCATION ID FOR THE NTH IRZ INJECTION WELLS IS "IRZXX-". EXCHANGE "IRZXX-" FOR "***" TO COMPLETE TAG OR INSTRUMENT REFERENCE. REFER TO SHEET I-15A FOR A TABLE OF LOCATION IDS.
 4. SEE SHEET I-15A FOR INTERLOCK TABLE.

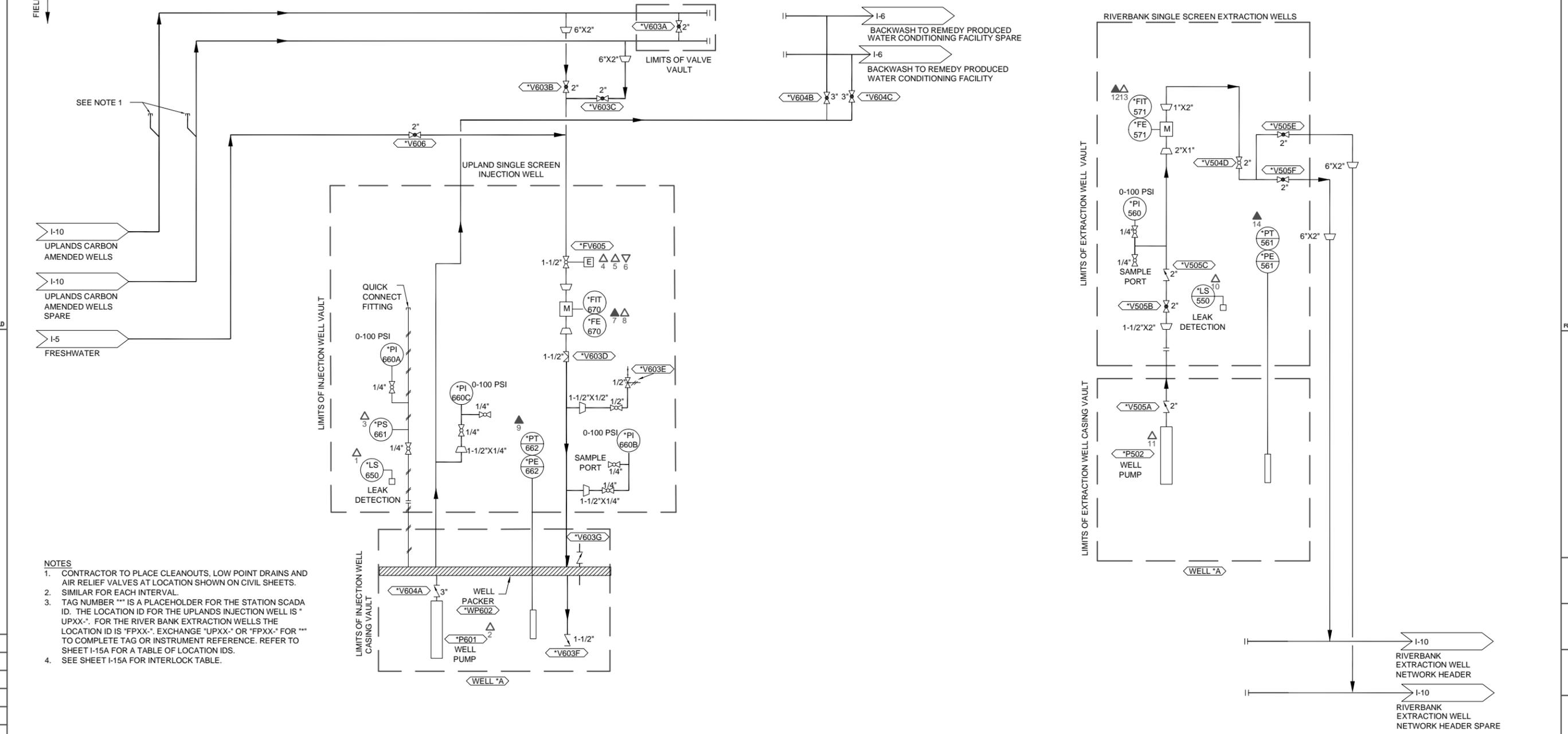
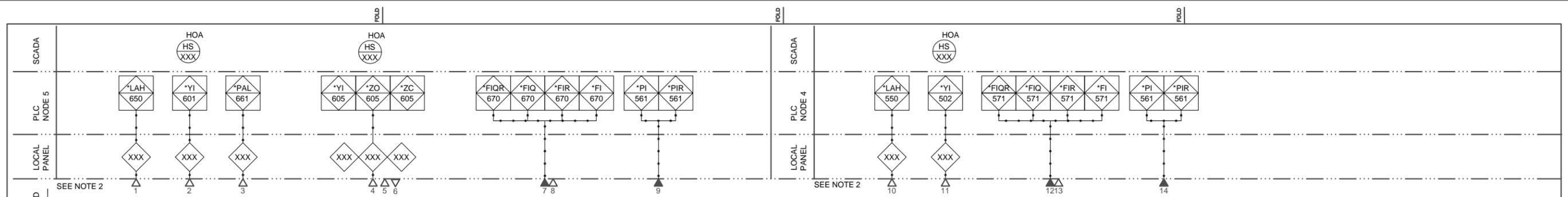
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REVISIONS			
NO.	DATE	DESCRIPTION	APPD. NO. DATE

TOPOCK GROUNDWATER REMEDIATION PROJECT NORTH NTH IRZ INJECTION WELLS P&ID PACIFIC GAS AND ELECTRIC COMPANY SAN FRANCISCO, CALIFORNIA		JCN _____ AREA _____ COUNTY _____ PROFILE _____ SHEET NO. _____ OF _____ DRAWING NUMBER _____ I-12B CHANGE _____
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G:\project\PG&E\RC000689\TOPOCK\CADD\Final Remedy\30% - Final\I-2, I-3, I-13, I-14, I-15, I-15A.dwg, I-13, 11/17/2011 11:39:34 AM



- NOTES**
- CONTRACTOR TO PLACE CLEANOUTS, LOW POINT DRAINS AND AIR RELIEF VALVES AT LOCATION SHOWN ON CIVIL SHEETS. SIMILAR FOR EACH INTERVAL.
 - TAG NUMBER "XXX" IS A PLACEHOLDER FOR THE STATION SCADA ID. THE LOCATION ID FOR THE UPLANDS INJECTION WELL IS "UPXX-". FOR THE RIVER BANK EXTRACTION WELLS THE LOCATION ID IS "FPXX-". EXCHANGE "UPXX-" OR "FPXX-" FOR "XXX" TO COMPLETE TAG OR INSTRUMENT REFERENCE. REFER TO SHEET I-15A FOR A TABLE OF LOCATION IDS.
 - SEE SHEET I-15A FOR INTERLOCK TABLE.

DATUM: HORIZONTAL:		PROJECTION:		NOV 2011 PRELIMINARY PLANS - NOT FOR CONSTRUCTION		APPRD BY:		AUTHORIZATION:	
VERTICAL:		UNITS:				BY: KD		DR: SS	
REFERENCE DWGS:						CH: JF		DATE:	
SCALES: 1 inch =						APPRD:		DATE:	
1 centimeter =									
CENTIMETERS		INCHES		REVISIONS					
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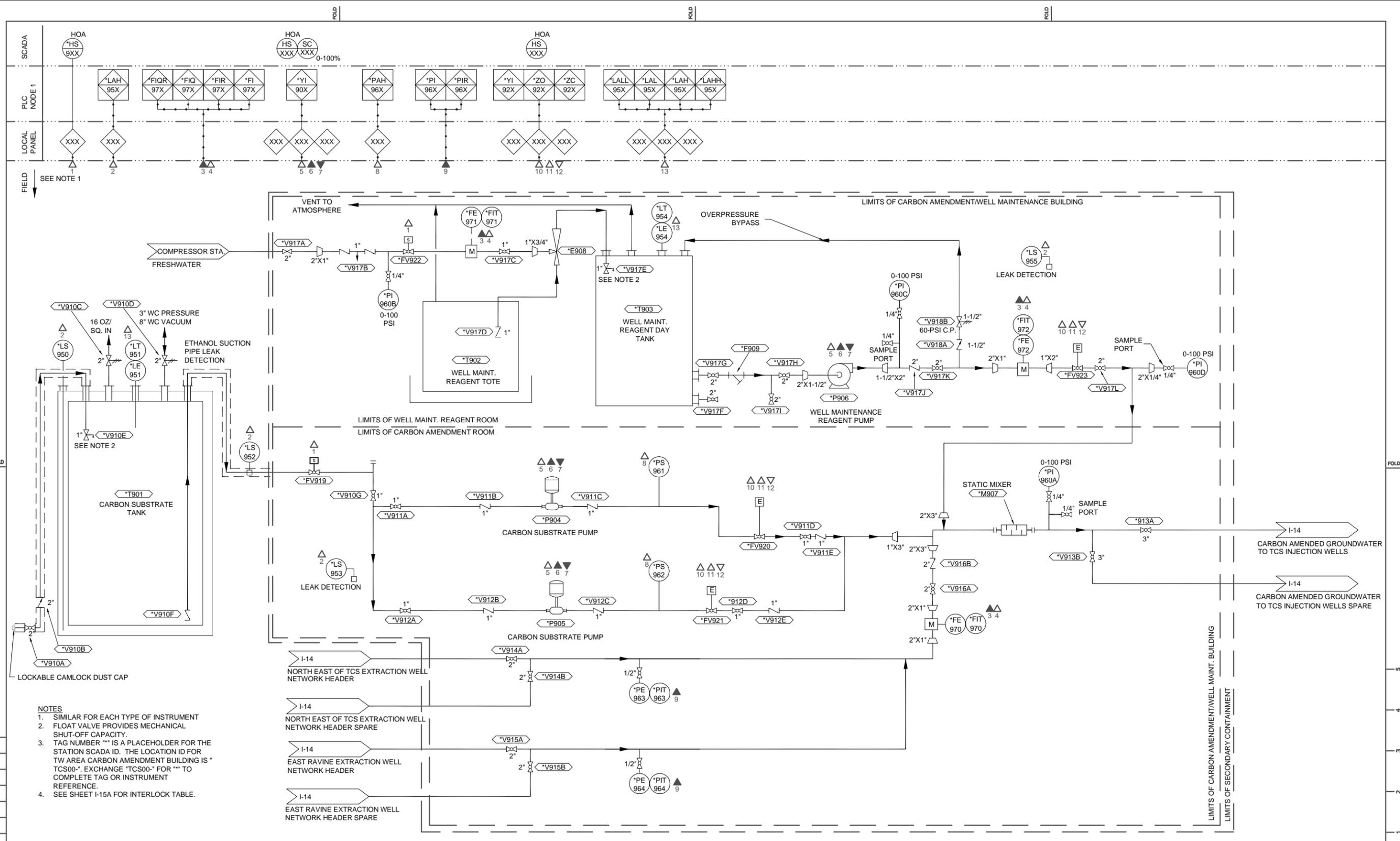
TOPOCK GROUNDWATER REMEDIATION PROJECT
RIVER BANK EXTRACTION AND UPLAND
INJECTION WELLS P&ID

PACIFIC GAS AND ELECTRIC COMPANY
 SAN FRANCISCO, CALIFORNIA

JCH
 AREA
 COUNTY
 PROFILE

SHEET NO. OF
 I-13

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- NOTES**
1. SIMILAR FOR EACH TYPE OF INSTRUMENT
 2. FLOAT VALVE PROVIDES MECHANICAL SHUT-OFF CAPACITY.
 3. TAG NUMBER "XX" IS A PLACEHOLDER FOR THE STATION SCADA ID. THE LOCATION ID FOR TW AREA CARBON AMENDMENT BUILDING IS "TCS00". EXCHANGE "TCS00-" FOR "XX" TO COMPLETE TAG OR INSTRUMENT REFERENCE.
 4. SEE SHEET I-15A FOR INTERLOCK TABLE.

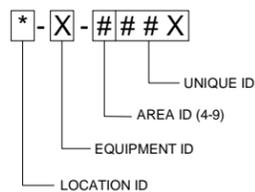
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VERTICAL:		UNITS:				BY: KD		DR: SS	
REFERENCE DWGS:						CH: JF		O.K.: JF	
SCALES: 1 inch =						DATE:			
1 centimeter =									
				REVISIONS					
				NO. DATE DESCRIPTION		APPD. NO. DATE DESCRIPTION		APPD. NO. DATE DESCRIPTION	

TOPOCK GROUNDWATER REMEDIATION PROJECT
TW BENCH CARBON AMENDMENT BUILDING
P&ID
 PACIFIC GAS AND ELECTRIC COMPANY
 SAN FRANCISCO, CALIFORNIA

JCN: _____
 AREA: _____
 COUNTY: _____
 PROFILE: _____
 SHEET NO. OF: _____
 DRAWING NUMBER: I-15 OF _____
 CHANGE: _____



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NOTES

1. AREA ID 10 DENOTES NTH IRZ CARBON AMENDMENT AND WELL MAINTENANCE BUILDINGS

INTERLOCKS

- NODE BUILDING LEAK DETECTION
DISABLE PUMPS P-XXX. DISABLE FLOW CONTROL VALVES FV-XXX.
- WELL MAINTENANCE REAGENT DAY TANK LEVEL
DISABLE PUMP P-XXX.
- WELL MAINT. REAGENT DOSING SEQUENCE
DISABLE PUMPS P-XXX. CLOSE SOLENOID VALVES FV-XXX.
- FORCEMAIN LOW PRESSURE DETECTION
DISABLE PUMPS P-XXX. DISABLE FLOW CONTROL VALVES FV-XXX.
- PIPELINE LEAK DETECTION
DISABLE PUMP P-XXX. DISABLE FLOW CONTROL VALVE FV-XXX.
- WELL HEAD VAULT FLOAT SWITCH INTERLOCK
DISABLE PUMPS P-XXX. DISABLE FLOW CONTROL VALVES FV-XXX.

IRZ (AREA ID 4)			
WELL NUMBER	LOCATION ID	WELL SCREEN INTERVAL	PHYSICAL WELL ID
IRZ-1	IRZ01-	1	IRZ01-A
IRZ-1	IRZ01-	2	IRZ01-A
IRZ-1	IRZ01-	3	IRZ01-B
IRZ-1	IRZ01-	4	IRZ01-B
IRZ-5	IRZ05-	1	IRZ05-A
IRZ-5	IRZ05-	2	IRZ05-A
IRZ-5	IRZ05-	3	IRZ05-B
IRZ-5	IRZ05-	4	IRZ05-B
IRZ-9	IRZ09-	1	IRZ09-A
IRZ-9	IRZ09-	2	IRZ09-A
IRZ-9	IRZ09-	3	IRZ09-B
IRZ-9	IRZ09-	4	IRZ09-B
IRZ-11	IRZ11-	1	IRZ11-A
IRZ-11	IRZ11-	2	IRZ11-A
IRZ-11	IRZ11-	3	IRZ11-B
IRZ-11	IRZ11-	4	IRZ11-B
IRZ-13	IRZ13-	1	IRZ13-A
IRZ-13	IRZ13-	2	IRZ13-A
IRZ-13	IRZ13-	3	IRZ13-B
IRZ-13	IRZ13-	4	IRZ13-B
IRZ-15	IRZ15-	1	IRZ15-A
IRZ-15	IRZ15-	2	IRZ15-A
IRZ-15	IRZ15-	3	IRZ15-B
IRZ-15	IRZ15-	4	IRZ15-B
IRZ-16	IRZ16-	1	IRZ16-A
IRZ-16	IRZ16-	2	IRZ16-A
IRZ-16	IRZ16-	3	IRZ16-B
IRZ-16	IRZ16-	4	IRZ16-B
IRZ-17	IRZ17-	1	IRZ17-A
IRZ-17	IRZ17-	2	IRZ17-A
IRZ-17	IRZ17-	3	IRZ17-B
IRZ-17	IRZ17-	4	IRZ17-B
IRZ-19	IRZ19-	1	IRZ19-A
IRZ-19	IRZ19-	2	IRZ19-A
IRZ-19	IRZ19-	3	IRZ19-B
IRZ-19	IRZ19-	4	IRZ19-B
IRZ-20	IRZ20-	1	IRZ20-A
IRZ-20	IRZ20-	2	IRZ20-A
IRZ-20	IRZ20-	3	IRZ20-B
IRZ-20	IRZ20-	4	IRZ20-B
IRZ-21	IRZ21-	1	IRZ21-A
IRZ-21	IRZ21-	2	IRZ21-A
IRZ-21	IRZ21-	3	IRZ21-B
IRZ-21	IRZ21-	4	IRZ21-B
IRZ-23	IRZ23-	1	IRZ23-A
IRZ-23	IRZ23-	2	IRZ23-A
IRZ-23	IRZ23-	3	IRZ23-B
IRZ-23	IRZ23-	4	IRZ23-B
IRZ-25	IRZ25-	1	IRZ25-A
IRZ-25	IRZ25-	3	IRZ25-A
IRZ-27	IRZ27-	1	IRZ27-A
IRZ-27	IRZ27-	3	IRZ27-A
IRZ-29	IRZ29-	1	IRZ29-A
IRZ-29	IRZ29-	3	IRZ29-A
IRZ-31	IRZ31-	1	IRZ31-A
IRZ-31	IRZ31-	3	IRZ31-A
IRZ-33	IRZ33-	1	IRZ33-A
IRZ-33	IRZ33-	3	IRZ33-A
IRZ-35	IRZ35-	1	IRZ35-A
IRZ-37	IRZ37-	1	IRZ37-A
IRZ-39	IRZ39-	1	IRZ39-A

FUTURE PROVISIONAL IRZ (AREA ID 4)			
WELL NUMBER	LOCATION ID	WELL SCREEN INTERVAL	PHYSICAL WELL ID
IRZ-2	IRZ02-	1	IRZ02-A
IRZ-2	IRZ02-	2	IRZ02-A
IRZ-2	IRZ02-	3	IRZ02-B
IRZ-2	IRZ02-	4	IRZ02-B
IRZ-3	IRZ03-	1	IRZ03-A
IRZ-3	IRZ03-	2	IRZ03-A
IRZ-3	IRZ03-	3	IRZ03-B
IRZ-3	IRZ03-	4	IRZ03-B
IRZ-4	IRZ04-	1	IRZ04-A
IRZ-4	IRZ04-	2	IRZ04-A
IRZ-4	IRZ04-	3	IRZ04-B
IRZ-4	IRZ04-	4	IRZ04-B
IRZ-6	IRZ06-	1	IRZ06-A
IRZ-6	IRZ06-	2	IRZ06-A
IRZ-6	IRZ06-	3	IRZ06-B
IRZ-6	IRZ06-	4	IRZ06-B
IRZ-7	IRZ07-	1	IRZ07-A
IRZ-7	IRZ07-	2	IRZ07-A
IRZ-7	IRZ07-	3	IRZ07-B
IRZ-7	IRZ07-	4	IRZ07-B
IRZ-8	IRZ08-	1	IRZ08-A
IRZ-8	IRZ08-	2	IRZ08-A
IRZ-8	IRZ08-	3	IRZ08-B
IRZ-8	IRZ08-	4	IRZ08-B
IRZ-10	IRZ10-	1	IRZ10-A
IRZ-10	IRZ10-	2	IRZ10-A
IRZ-10	IRZ10-	3	IRZ10-B
IRZ-10	IRZ10-	4	IRZ10-B
IRZ-12	IRZ12-	1	IRZ12-A
IRZ-12	IRZ12-	2	IRZ12-A
IRZ-12	IRZ12-	3	IRZ12-B
IRZ-12	IRZ12-	4	IRZ12-B
IRZ-14	IRZ14-	1	IRZ14-A
IRZ-14	IRZ14-	2	IRZ14-A
IRZ-14	IRZ14-	3	IRZ14-B
IRZ-14	IRZ14-	4	IRZ14-B
IRZ-18	IRZ18-	1	IRZ18-A
IRZ-18	IRZ18-	2	IRZ18-A
IRZ-18	IRZ18-	3	IRZ18-B
IRZ-18	IRZ18-	4	IRZ18-B
IRZ-22	IRZ22-	1	IRZ22-A
IRZ-22	IRZ22-	2	IRZ22-A
IRZ-22	IRZ22-	3	IRZ22-B
IRZ-22	IRZ22-	4	IRZ22-B
IRZ-24	IRZ24-	1	IRZ24-A
IRZ-24	IRZ24-	3	IRZ24-A
IRZ-26	IRZ26-	1	IRZ26-A
IRZ-26	IRZ26-	3	IRZ26-A
IRZ-28	IRZ28-	1	IRZ28-A
IRZ-28	IRZ28-	3	IRZ28-A
IRZ-30	IRZ30-	1	IRZ30-A
IRZ-30	IRZ30-	3	IRZ30-A
IRZ-32	IRZ32-	1	IRZ32-A
IRZ-32	IRZ32-	3	IRZ32-A
IRZ-34	IRZ34-	1	IRZ34-A
IRZ-34	IRZ34-	3	IRZ34-A
IRZ-36	IRZ36-	1	IRZ36-A
IRZ-38	IRZ38-	1	IRZ38-A
IRZ-40	IRZ40-	1	IRZ40-A

RIVERBANK (AREA ID 5)			
WELL NUMBER	LOCATION ID	WELL SCREEN INTERVAL	PHYSICAL WELL ID
FR-EX-1	FP01-	1	FP01-A
FP-EX-2	FP02-	1	FP02-A
FP-EX-3	FP03-	1	FP03-A
FP-EX-4	FP04-	1	FP04-A
FP-EX-5	FP05-	1	FP05-A

UPLANDS (AREA ID 6)			
WELL NUMBER	LOCATION ID	WELL SCREEN INTERVAL	UNIQUE ID
UPGRAD-INJ-1	UP01-	1	UP01-A
UPGRAD-INJ-2	UP02-	1	UP02-A
UPGRAD-INJ-3	UP03-	1	UP03-A
UPGRAD-INJ-4	UP04-	1	UP04-A

EAST RAVINE (AREA ID 7)			
WELL NUMBER	LOCATION ID	WELL SCREEN INTERVAL	UNIQUE ID
RAV-EX-1	RAV01-	1	RAV01-A
RAV-EX-2	RAV02-	1	RAV02-A
RAV-EX-3	RAV03-	1	RAV03-A
RAV-EX-4	RAV04-	1	RAV04-A

NORTHEAST OF TCS (AREA ID 8)			
WELL NUMBER	LOCATION ID	WELL SCREEN INTERVAL	UNIQUE ID
MID-EX-1	MID01-	1	MID01-A
MID-EX-2	MID02-	1	MID02-A
MID-EX-3	MID03-	1	MID03-A
MID-EX-4	MID04-	1	MID04-A

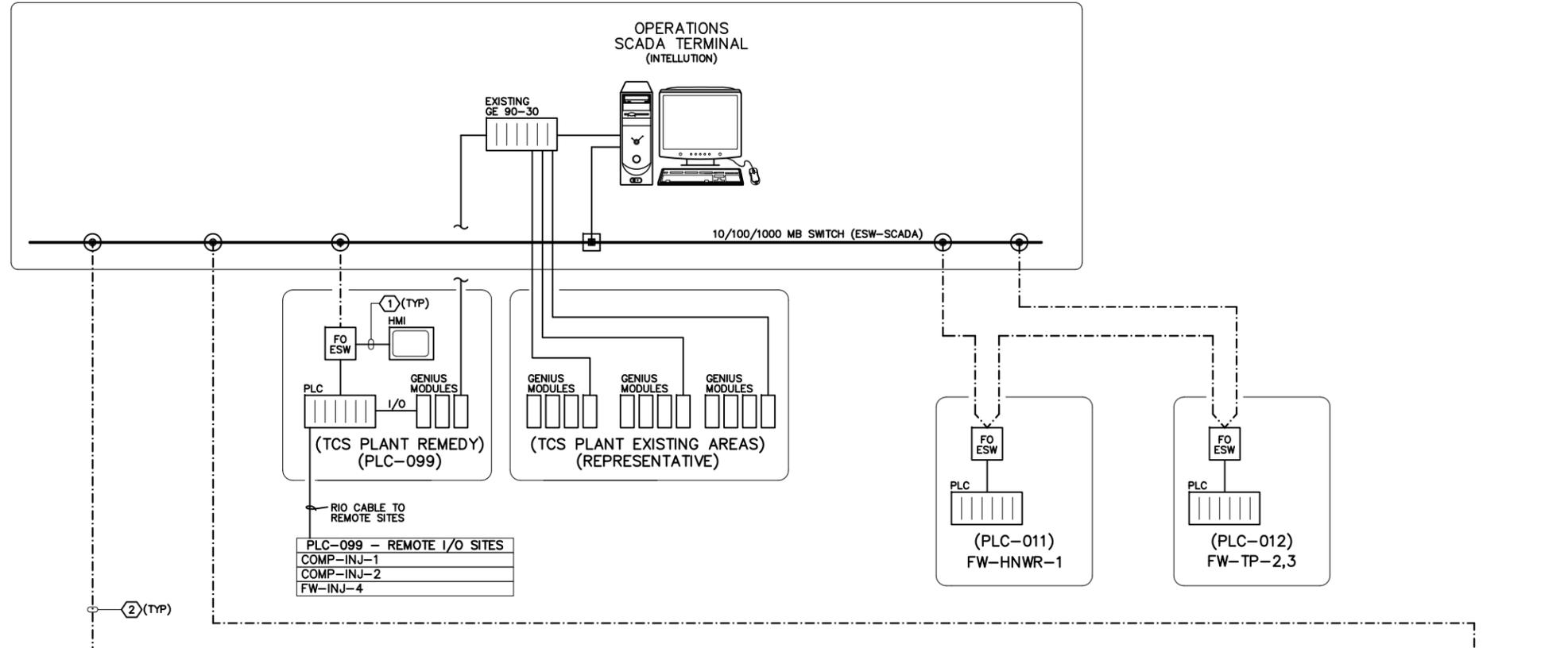
TCS AREA (AREA ID 9)			
WELL NUMBER	LOCATION ID	WELL SCREEN INTERVAL	UNIQUE ID
COMP-INJ-1	TCS01-	1	TCS01-A
COMP-INJ-1	TCS01-	3	TCS01-A
COMP-INJ-2	TCS02-	1	TCS02-A
COMP-INJ-2	TCS02-	3	TCS02-A

DATUM: HORIZONTAL:	PROJECTION:	NOV 2011 PRELIMINARY PLANS - NOT FOR CONSTRUCTION																						
VERTICAL:	UNITS:																							
REFERENCE DWGS:																								
SCALES: 1 inch = 10 feet																								
1 centimeter = 10 meters																								
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NO.	DATE	DESCRIPTION	APPD.	NO.	DATE	DESCRIPTION	APPD.	NO.	DATE	DESCRIPTION														
REVISIONS																								

TOPOCK GROUNDWATER REMEDIATION PROJECT REMEDY WELL ID SCHEDULE			JCN _____ AREA _____ COUNTY _____ PROFILE _____
PACIFIC GAS AND ELECTRIC COMPANY SAN FRANCISCO, CALIFORNIA			SHEET NO. _____ OF _____ DRAWING NUMBER I-15A

TCS OPERATIONS BUILDING

OPERATIONS SCADA TERMINAL (INTELLUTION)



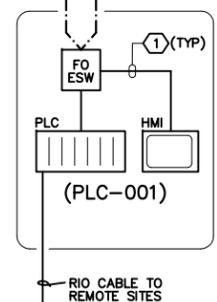
LEGEND	
SYMBOL	DESCRIPTION
	PLC CONTROL PANEL
	HUMAN MACHINE INTERFACE LOCAL TOUCHSCREEN PANEL
	FIBER OPTIC ETHERNET SWITCH
	FIBER OPTIC LC SFP MODULE GIGABIT CONNECTION
	RJ-45 ETHERNET (CAT6) GIGABIT CONNECTION

NOTES:

- ① CAT-5 ETHERNET CABLE CONNECTION
- ② FIBER OPTIC (SINGLEMODE) CABLE CONNECTION

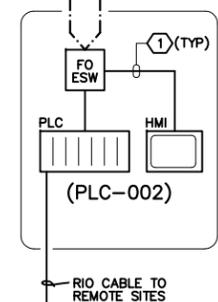
PLC-099 - REMOTE I/O SITES

COMP-INJ-1
COMP-INJ-2
FW-INJ-4



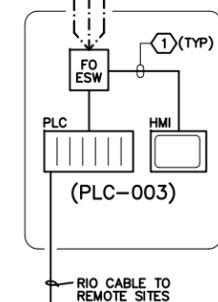
PLC-001 - REMOTE I/O SITES
TWB CARBON AMENDMENT

RAV-EXT-1
RAV-EXT-2
RAV-EXT-3
RAV-EXT-4
MID-EX-1
MID-EX-2
MID-EX-3
MID-EX-4



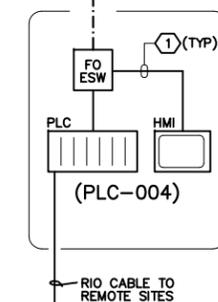
PLC-002 - REMOTE I/O SITES
NTH CARBON AMENDMENT

IRZ-22
IRZ-23
IRZ-24
IRZ-25
IRZ-26
IRZ-27
IRZ-28
IRZ-29
IRZ-30
IRZ-31
IRZ-32
IRZ-33
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IRZ-40



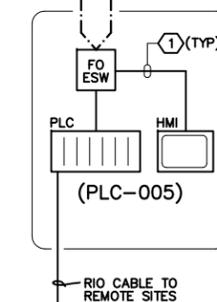
PLC-003 - REMOTE I/O SITES

IRZ-2
IRZ-4
IRZ-6
IRZ-8
IRZ-10
IRZ-11
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IRZ-14
IRZ-15
IRZ-16
IRZ-17
IRZ-18
IRZ-19
IRZ-20
IRZ-21



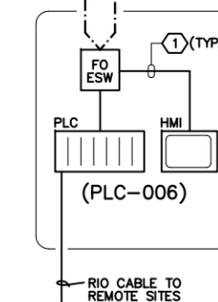
PLC-004 - REMOTE I/O SITES

FP-EX-1
FP-EX-2
FP-EX-3
FP-EX-4
FP-EX-5
IRZ-1
IRZ-3
IRZ-5
IRZ-7
IRZ-9



PLC-005 - REMOTE I/O SITES

FW-INJ-1



PLC-006 - REMOTE I/O SITES

FW-INJ-2
UPGRAD-INJ-1
UPGRAD-INJ-2
UPGRAD-INJ-3
UPGRAD-INJ-4

DATUM: HORIZONTAL: PROJECTION: NOV 2011 PRELIMINARY PLANS

VERTICAL: UNITS: REFERENCE DWGS:

SCALES: 1 Inch = 1 centimeter =

NO.	DATE	DESCRIPTION	APPD.	NO.	DATE	DESCRIPTION	APPD.	NO.	DATE	DESCRIPTION	APPD.
REVISIONS											

APPRD BY: AUTHORIZATION

BY THOMAS FRISCH
DR BRIAN WOODIN
CH THOMAS FRISCH
O,K,
DATE

TOPOCK GROUNDWATER REMEDIATION
SCADA BLOCK DIAGRAM

PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

JCN	AREA	COUNTY	PROFILE
SHEET NO.	OF	DRAWING NUMBER	CHANGE
I-16			

FOLD

FOLD

10
9
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CENTIMETERS

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INCHES