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October 6, 2005
184288

DOCKET	
04-AFC-1	
DATE	OCT - 6 2005
RECD.	OCT - 7 2005

Mr. William Pfanner
Siting Project Manager
California Energy Commission
1516 Ninth Street, MS-15
Sacramento, CA 95814-5504

RE: Data Response Set 3E and Sarvey Response Set 1B
San Francisco Electric Reliability Project (04-AFC-1)

Dear Bill:

On behalf of the City of San Francisco, please find attached 12 copies and one original of Data Response, Set 3E, in response to Staff's Data Requests dated May 2, 2005; and Data Response, Set 1B in response to Bob Sarvey's Data Requests dated June 24, 2005. Copies of the data responses are being filed both electronically and in hard copy.

Please call me if you have any questions.

Sincerely,

CH2M HILL

John L. Carrier, J.D.
Program Manager

c: Project File
Proof of Service List

**SAN FRANCISCO ELECTRIC
RELIABILITY PROJECT
(04-AFC-1)**

DATA RESPONSE, SET 3E
(Response to Data Request: 173)

Submitted by
CITY AND COUNTY OF SAN FRANCISCO

October 6, 2005



2485 Natomas Park Drive, Suite 600
Sacramento, California 95833-2937

**San Francisco Electric Reliability Project (SFERP)
(04-AFC-1)
Supplement A Data Response, Set 3E**

Technical Area: Cultural Resources

CEC Authors: Beverly E. Bastian and Gary Reinoehl

SFERP Author: Geof Spaulding

BACKGROUND

The Supplement A states that a geotechnical boring study of the proposed site will be done (p. 10G-4). Such a study could provide information on submerged cultural resources located on the former Bay floor.

DATA REQUEST

173. If geotechnical boring has not yet been completed, please have an archaeologist, who meets the Secretary of the Interior's Professional Standards, monitor the boring and write a report, consistent with ARMR format, on any cultural materials present in the cores, descriptions of sediments, and an assessment of the potential of the project to disturb buried cultural resources. Please provide staff with a copy of that report within 30 days of completion of the boring. If it is not possible to meet that schedule, please provide staff with a projected date for submitting the report.

Response: As stated in our response to Data Request #161 (see Data Response Set 3D), in monitoring the geotechnical borings, drill hole B-4 contained scattered wood fragments at a depth of about 100 feet. These fragments clearly come from the sediments at this depth and are not artifacts of drilling from a different level. Based on preliminary examination, the specimens are from an angiosperm/hardwood species. Because there is no evidence of association with human activity, they have been classified as a paleontological find and have been remanded to project paleontologist/paleoecologist Geof Spaulding and submitted to a laboratory for radiocarbon assay. The results will be provided in response to Data Request #173.

The referenced Paleontological technical memorandum describing the analysis of the wood fragments is provided as Attachment CR-173.

Paleontologic Sensitivity of Subsurface Sediments of Islais Creek Estuary

PREPARED FOR: John Carrier/SAC
COPIES: Doug Davy/SAC
PREPARED BY: Geof Spaulding/LAS
DATE: September 30, 2005

Introduction & Context

The San Francisco Electric Reliability Project (SFERP) entails the installation of three natural gas-fired generators by the San Francisco Public Utilities Commission (SFPUC) in or near San Francisco, and their operation under a contract with the California Department of Water Resources. The project has three main objectives:

- Improving San Francisco's electric reliability,
- Facilitating the shutdown of old and highly polluting in-city electric generation, and
- Minimizing the local impacts of electric generation.

The electric transmission system serving San Francisco is a radial extension of the northern California network that is particularly vulnerable to disruptions. Because the system serving San Francisco is not looped (allowing electricity to flow to the City from a different direction), San Francisco and the Peninsula depend upon older power plants in the City for electricity. San Francisco power plants range in age from 27 to 45 years old and they are inefficient and the source of significant amounts of air pollution. To allow shutdown of San Francisco's fleet of old generation stations, the SFPUC has determined that the SFERP should consist of three combustion turbines totaling 145 megawatts of generation.

The SFERP site is located in the Potrero District, between Cesar Chavez St. and 25th St., less than 1,000 feet north of the current channel of Islais Creek. This area, the Islais Creek Estuary, is one of several historically estuarine areas on the east shore of the San Francisco Peninsula that is currently thoroughly developed. During the 19th and early 20th Century great amounts of fill were dumped in these coves to raise their surfaces above sea level for primarily industrial development.

Prior to construction, subsurface investigations including geotechnical drilling are being performed. Drilling to depths exceeding the thickness of historic fill, and well into older sediments of the Bay and estuary allows characterization of subsurface stratigraphy, and can be used to establish paleontologic sensitivity of the underlying sediments. The subject of this memorandum is the age of sediments below historic fill and their consequent paleontologic sensitivity. The stratigraphy revealed by geotechnical investigations, prior work by the U.S. Geological Survey (Atwater et al., 1977) and radiocarbon dating were used to this end.

Attachment CR-173

Geochronological Setting

During the last 700,000 years at least 6 global ice ages occurred, separated by world-wide warming periods of which the current Holocene is the most recent. Each transition from glacial age to interglaciation, or from interglaciation to glacial age, was accompanied by a radical change in sea level as the continental ice sheets accumulated or released prodigious amounts of water. For most of the last glacial age, from about 80,000 to 14,000 B.P. (years before present), sea level was as much as 400 feet lower than at present because the expanded ice sheets locked up that much of the planet's water (Bloom, 1983). During that period, drainages such as Islais Creek down-cut in response to a lower base level, eroding channels potentially hundreds of feet deep in what was then a broad valley and not a bay. The Bay did not exist because the full-glacial Pacific coastline was then west of the present-day Farallon Islands (Atwater et al., 1977; Clifton and Leithold, 1991; Sloan and Lipps, 2002). When sea level began to rise at the end of the last glacial age, these streams began to aggrade until they reached their approximate present elevation in concert with rising sea level sometime between 6,000 and 3,500 B.P. As Wahrhaftig and Birman (1965) put it:

“During and after the postglacial rise in sea level, as much as 30 m (100 ft) of bay mud...have accumulated on the bay floor, partially burying an irregular topography carved on the Pleistocene formations.” (parentheses added)

Atwater and others (1977) calculated that the advancing deglacial shoreline passed the Golden Gate and entered southern San Francisco Bay, where the SFERP project site is located, 10,000 to 11,000 B.P. Prior to that time, sediments laid down in the Islais Creek Estuary were terrestrial and included eolian (dune) sand and alluvium. When the area was inundated, marine muds were laid down. The marine sediments directly underlying artificial fill at the SFERP site record this last, Holocene period of high sea level and are younger than sediments typically assigned high paleontologic sensitivity. As a matter of course, Pleistocene or older sediments (>10,000 B.P.) are assigned high paleontologic sensitivity (barring other factors), while Holocene sediments (<10,000 B.P.) are assigned low paleontologic sensitivity.

Stratigraphic and Geochronological Investigations

Geotechnical drilling at the SFERP site was to depths exceeding the thickness of historic fill, and well into older sediments of the Bay and Islais Creek Estuary. Drill Hole B-4, on the south side of the Concrete Batch Plant immediately west and north of Pier 80, yielded a sedimentary sequence reflecting the transgressions and retreats of sea level during the middle and late Pleistocene (Appendix CR-173A). The upper part of that sequence is summarized below:

- Artificial fill to a depth of about 29 feet below presents ground surface (bgs)
- “Young Bay Mud” of postglacial age (<10,000 B.P.) to ca. 68 feet bgs
- “Bayside Sands”; terrestrial sediment representing the last glacial age (and dry ground), to ca. 80 feet bgs
- “Older Bay Mud” dating to the last major interglacial sea level rise, from 80,000 to 128,000 B.P., extending to a depth of ca. 107 feet bgs

Attachment CR-173

Beneath this initial series of “mud-sand-mud” are older layers repeating the sequence (Attachment 1) and recording earlier glacial-interglacial cycles, representing a more complete series than typically encountered by Atwater et al. (1977) during their study.

Because these ages are inferred and not directly tested, radiocarbon analysis was performed on a piece of subfossil wood approximately 3 cubic centimeters in size recovered from a depth of ca. 100 feet bgs in Drill Hole B-4. The sediment hosting the wood sample was an olive-black, organic-rich sandy mud with common small carbonized wood fragments. The sand grains are distinctly angular and polymineralic. The wood appeared unaltered other than being thoroughly blackened, and was evidently preserved through burial in an anaerobic environment. The drill log indicates that the specimen is from the lower stratum of the shallowest “Older Bay Mud” unit (Attachment 1), and therefore likely to date to the last interglaciation (80,000 to 128,000 B.P.) (Atwater et al., 1978). A subsample was submitted for AMS (accelerator mass spectrometry) ¹⁴C dating to Beta Analytic of Coral Gables, Florida. The result (Beta-208277) is >45,910 B.P., indicating that the sample is at least that age and likely older because no detectable ¹⁴C remains in the specimen. The hypothesis that this Older Bay Mud unit is 80,000 B.P. or older is therefore supported.

Conclusion

A model following that of Atwater and others (1977), in which the upper-most marine/estuarine sediments are Holocene in age, and in which older sediments are alternating sequences of terrestrial sands and “bay muds” marking glacial and interglacial environments, respectively, is supported by this study. The age of sediment at a depth of 100 feet below the surface at this locality in the Islais Creek Estuary exceeds the range of the ¹⁴C dating method and likely dates to the last interglacial (Sangamon, or Stage 5) sea level high of ca. 80,000 to 128,000 B.P.

Sediments of no paleontologic sensitivity (artificial fill) extend to a depth of approximately 29 feet bgs, with the Younger Bay Mud below it possessing low paleontologic sensitivity to a depth of ca. 68 feet bgs. High-sensitivity begins at a depth of about 68 feet bgs, and extends deeper (see Attachment 1). Sediments of low to no paleontologic sensitivity, therefore, extend to a depth of about 70 feet in the Islais Creek estuary.

References

- Atwater, B. F., C. W. Hedel, and E. J. Helley., 1977. Late Quaternary Depositional History, Holocene Sea-Level Changes, and Vertical Crustal Movement, Southern San Francisco Bay, California. *U. S. Geological Survey Professional Paper*. 1014, 15 p.
- Bloom, Arthur L., 1983. Sea Level and Coastal Morphology of the United States through the Late Wisconsin Glacial Maximum. In *Late Quaternary Environments of the United States, Volume 1, The Late Pleistocene*, edited by S. C. Porter, pp. 215-229. University of Minnesota Press, Minneapolis.
- Clifton, H. E., and E. L. Leithold, 1991. Quaternary Coastal and Shallow Marine Facies Sequences, Northern California and the Pacific Northwest. In *Quaternary Non-Glacial Geology: Conterminous U. S.*, Roger B. Morrison, ed. pp. 143-156. Geological Society of America, Boulder, CO.

Attachment CR-173

McGann, Mary, D. Sloan, and E. Wann. n.d. *Biostratigraphy Beneath Central San Francisco Bay along the San Francisco-Oakland Bay Bridge Transect*. geopubs.wr.usgs.gov/prof-paper/pp1658/ch3.pdf

Sloan, Doris, and J. H. Lipps, 2002. *Back to the Future: The History of San Francisco Bay*. Presentation at the University of California Museum of Paleontology, Berkeley. www.ucmp.berkeley.edu/museum/events/shortcourse2002/Lipps_SFBay.pdf

Wahrhaftig, Clyde, and J. H. Birman 1965 The Quaternary of the Pacific mountain system in California. In *The Quaternary of the United States*, edited by H. E. Wright, Jr., and D. G. Frey, pp. 299-340. Princeton University Press, New Jersey.

LOG OF DRILL HOLE



JOB NO.: SF05019
 PROJECT: Muni Power Plant
 LOCATION: South Side of Concrete Batch Plant
 DRILLING METHOD: 8-inch Core Barrel and 5-inch Rotary Wash

LOGGED BY: J. Seibold
 CHECKED BY:

DRILL HOLE NO.: B-4
 DRILLING DATE: 7/23/2005
 ELEVATION:
 DATUM:

DEPTH (FEET)	SAMPLE	BLOW COUNT	TORVANE SHEAR STRENGTH (TSF)	POCKET PENETROMETER COMP. STRENGTH (TSF)	PHOTOVAC TIP READING (PPM)	GRAPHIC LOG	GEOTECHNICAL DESCRIPTION AND CLASSIFICATION	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	ATTERBERG LIMITS		UNCONFINED SHEAR STRENGTH (PSF)	ADDITIONAL TESTS
										LIQUID LIMIT (%)	PLASTIC LIMIT (%)		
5	Bulk Sample	40					"ARTIFICIAL FILL (af)" GRAVELLY SAND with SILT (SP-SM), light olive gray, damp, fine to medium grained sand, rounded to subrounded gravel to 1½-inch.						
10		10					Medium dense, fine to coarse grained sand, zones of decomposed serpentinite, trace brick and ceramic tile fragments.						
15		9					CLAYEY SAND (SC) with GRAVEL, light olive gray, damp, loose, predominantly decomposed serpentinite with angular gravel clasts to 1½-inches, serpentinite and greenstone clasts.						
20		13					Medium dense.						
25		19					Serpentinite gravel clasts to 2½-inches. 3-inch cobble in cuttings.						
30		7		0.20			"YOUNGER BAY MUD (Qybm)" FAT CLAY (CH), dark greenish gray, moist, very soft to soft, high plasticity clay with silt and scattered shell fragments.						
35		150 psi		0.55			Cobble.						
40		4	0.25	0.60			Soft to medium stiff, increasing shell fragments.						
45		75 psi					No apparent shell fragments.						
		6	0.28										

LOG_DRILL_HOLE_SF05019.GPJ GTC.GDT 8/11/05

LOG OF DRILL HOLE



JOB NO.: SF05019
 PROJECT: Muni Power Plant
 LOCATION: South Side of Concrete Batch Plant
 DRILLING METHOD: 8-inch Core Barrel and 5-inch Rotary Wash

LOGGED BY: J. Seibold
 CHECKED BY:

DRILL HOLE NO.: B-4
 DRILLING DATE: 7/23/2005
 ELEVATION:
 DATUM:

DEPTH (FEET)	SAMPLE	BLOW COUNT	TORVANE SHEAR STRENGTH (TSF)	POCKET PENETROMETER COMP. STRENGTH (TSF)	PHOTOVAC TIP READING (PPM)	GRAPHIC LOG	GEOTECHNICAL DESCRIPTION AND CLASSIFICATION	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	ATTERBERG LIMITS		UNCONFINED SHEAR STRENGTH (PSF)	ADDITIONAL TESTS
										LIQUID LIMIT (%)	PLASTIC LIMIT (%)		
55		0 psi		0.55									
60		0	0.31				SILTY CLAY (CH) with SAND, dark gray, moist, soft, high plasticity silty clay, approximately 5% very fine grained sand, trace organics at 60.5 feet.						
65		24	0.15				Greenish gray, grading to clayey sand.						
70		50/6"					"BAYSIDE SANDS (Qbs)" POORLY GRADED SAND (SP), yellowish gray grading to dark yellowish orange, moist, very dense, fine grained sand, approximately 2-5% silt.						
75		50/6"					POORLY GRADED SAND with SILT (SP-SM), moderate yellowish brown, wet, very dense, fine grained sand, approximately 10% silt.						
80							"OLDER BAY MUD (Qobm)" SILTY CLAY (CH), grayish blue green with minor grayish orange mottling, moist, medium stiff to stiff, high plasticity clay, approximately 15% silt.						
85		15		1.5									
90		0		0.55			Medium stiff, medium blue gray, no mottling.						
95													
		0					CLAYEY SILT (ML), olive black, wet, soft, scattered wood fragments.						

LOG_DRILL_HOLE_SF05019.GPJ GTC.GDT 8/11/05

LOG OF DRILL HOLE



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DRILL HOLE NO.: B-4
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DEPTH (FEET)	SAMPLE	BLOW COUNT	TORVANE SHEAR STRENGTH (TSF)	POCKET PENETROMETER COMP. STRENGTH (TSF)	PHOTOVAC TIP READING (PPM)	GRAPHIC LOG	GEOTECHNICAL DESCRIPTION AND CLASSIFICATION	DRY DENSITY (PCF)	MOISTURE CONTENT (%)	ATTERBERG LIMITS		UNCONFINED SHEAR STRENGTH (PSF)	ADDITIONAL TESTS
										LIQUID LIMIT (%)	PLASTIC LIMIT (%)		
105													
110		50/6"					"BAYSIDE SANDS (Qbs)" POORLY GRADED SAND with SILT (SP-SM), yellowish to light olive gray, wet, very dense, fine grained sand.						
115							"OLDER BAY MUD (Qobm)" FAT CLAY (CH), dark greenish gray, moist, medium stiff, high plasticity clay.						
120		0		1.1									
125													
130		7											
135													
140													
145							SANDY CLAY (CL) with GRAVEL, grayish blue green, moist, very stiff to hard, low plasticity silty clay, approximately 20% very fine grained sand and 20% medium angular gravel (shale fragments).						
		71											

LOG_DRILL_HOLE_SF05019.GPJ GTC.GDT 8/11/05

LOG OF DRILL HOLE



JOB NO.: SF05019
 PROJECT: Muni Power Plant
 LOCATION: South Side of Concrete Batch Plant
 DRILLING METHOD: 8-inch Core Barrel and 5-inch Rotary Wash

LOGGED BY: J. Seibold
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										LIQUID LIMIT (%)	PLASTIC LIMIT (%)		
155						[Diagonal Hatching]							
160						[Diagonal Hatching]	FAT CLAY (CH), pale green, moist.						
165						[Diagonal Hatching]	SANDY CLAY (CL) with GRAVEL, pale green???, moist.						
170	100/2"					[Diagonal Hatching]	"FRANCISCAN COMPLEX (KJf)" SHALE (R), dark gray to black, moderately strong, fractured. 1) Bottom on boring at 168 feet and 2-inches. 2) Groundwater measured at 10 feet. 3) Boring backfilled with cement grout.						
175						[Diagonal Hatching]							
180						[Diagonal Hatching]							
185						[Diagonal Hatching]							
190						[Diagonal Hatching]							
195						[Diagonal Hatching]							

LOG_DRILL_HOLE_SF05019.GPJ GTC.GDT 8/11/05

**SAN FRANCISCO ELECTRIC
RELIABILITY PROJECT
(04-AFC-1)**

DATA RESPONSE, SARVEY SET 1B
(Supplemental Response to Data Request: 1-3)

Submitted by
CITY AND COUNTY OF SAN FRANCISCO

October 6, 2005



2485 Natomas Park Drive, Suite 600
Sacramento, California 95833-2937

Air Quality

Background: According to BAAQMD data presented for the BayCamp Monitoring Station at Hunter Points recorded violations of the Federal PM 2.5 standards occurred in October and November of 2004. The applicant's project manager mentioned at the informational and site visit that other local monitoring sites had also been set up.

Data Request

- 1-3. Please provide the location of the additional monitoring sites and the monitoring results for those sites and provide monthly reports after responding to this data request.

Response: In Data Response Set 1A, the City said that it would provide data to the public from its monitoring stations. That information is available from the SFPUC's webpage:

http://sfwater.org/detail.cfm/MSC_ID/64/MTO_ID/128/MC_ID/7/C_ID/2661/holdSession/1

Then at the bottom of the page it says:

To view the latest results from the SFPUC's air-quality monitoring, go to:

<http://www.sierraresearch.com/sfpuc/>



CALIFORNIA
ENERGY
COMMISSION

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ELECTRONIC PROOF OF SERVICE LIST
Revised 8-03-05

SAN FRANCISCO ELECTRIC RELIABILITY PROJECT
APPLICATION FOR CERTIFICATION,
DOCKET NO. 04-AFC-1

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I declare that I transmitted the foregoing document via e-mail, or as indicated by first class postal mail, to the above named on the date indicated thereby. I declare under penalty of perjury that the foregoing is true and correct.

John L. Carrier, J.D.
Program Manager
CH2M HILL