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From: Campos, Alicia@Energy
Sent: Wednesday, February 20, 2013 2:41 PM
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Subject: 12-AFC-03 Redondo Beach Energy Project - Public Comment/Galen Hunter, Dated February 20, 2013 - Please Docket and Post to the Web

Categories: Ready to Docket

From: Galen Hunter [mailto:hunter@oldsaltlake.org]
Sent: Wednesday, February 20, 2013 2:11 PM
To: Kelly, Patricia@Energy
Cc: Energy - Public Adviser's Office
Subject: Comment on Application for Certification, Redondo Beach Energy Project (12-AFC-03)

California Energy Commission
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Comments on the data adequacy of the Application for Certification for Redondo Beach Energy Project (12-AFC-03)

Patricia -

There are errors and critical mistakes in the:

- Geologic Hazards and Resources Assessment
- Applicant Data Adequacy Supplement TN-69327.

Of all the errors and mistakes in these reports, the most critical is the stated conclusion about the scientific significance of the site.

These reports are a very inadequate assessment of the geotechnical status of the site.

What follows is text excerpted from these AES reports – with my comments inline.

Moreover, I provide additional relevant on-site scientific data about the geotechnical status of the Old Salt Lake site - data not found in the AES reports. I obtained this data via independent research. Basic due diligence.

The data I obtained and am presenting here is evidence the AES position about the scientific significance of the site is incorrect. The AES assessment of the geotechnical status of the site, I argue, is more about them trying to control their future remediation costs.

I conclude with a suggestion about what geotechnical data is still missing and needed to begin to remedy the data inadequacy of the AES description of the physical status of the site.

Regards,
Galen Hunter
www.oldsaltlake.org

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AES Text and my inline comments

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_____ 5.4.1.5 Geologic Resources of Recreational, Commercial, or Scientific Value _____

"There are no known geologic resources of recreational, commercial, or scientific value present at the RBEP site, thus, project construction would have no effect on oil and gas production or on other geologic resources of commercial value or on the availability of such resources."

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[comment]

I suspect this AES text: "no known geologic resources of recreational, commercial, or scientific value present at the RBEP site, … ", is less about the "project construction", and more about remediation.

My understanding is that when AES purchased the property from So. Cal. Edison, AES became responsible for the remediation of the hazardous materials operations on the site since 1905. In order to control remediation costs, the company needs to redefine history and geography. In other words, control of the argument about the geotechnical status of the site. The status of the site is key to the question about recreational, commercial, or scientific value and thus clean-up costs. I will show that the AES case about the geotechnical status of the site is in error and its conclusion about no recreational, commercial, or scientific value is in error.

[/comment]

_____ 5.4.2.3 Geological Resources _____

"RBEP will not result in a loss of availability of a known mineral resource that would be of value to the region and the residents of the state. Additionally, RBEP will not result in the loss of availability of a locally important mineral resource recovery site delineated on a local plan, specific plan, or other land use plan. There are no such resources that have been identified on or near the site, so there will be no adverse impacts on geological resources."

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[comment]

Here AES (an international corporation) declares the famous local resource site (Old Salt Lake) – dead. This "5.4.2.3 Geological Resources" is in itself a remarkable artifact of our culture.

OK, two brief points:

1. First, any such "loss of availability of a locally important mineral resource recovery site delineated on a local plan, specific plan, or other land use plan" occurred as the <u>cumulative effect</u> of well-known historical and cultural patterns. One of these important patterns is the relationship between human complexity and ecological/historical footprint. The AES Application for Certification further compounds the cumulative effect.

2. Second, as I will show below, it has not been precisely scientifically determined there has been a "loss of availability of a known mineral resource". Obviously here AES is referring to the famous local salt resource, being entirely lost. Not so fast – the exact source and status of the source of the salt is still unknown and, the possibility exists, could be scientifically knowable. More about this below.

Evidently, AES hired consultants to select and report general scientific data consistent with AES's economic interest and exclude more relevant local scientific data not consistent with their economic interest. The consultants hired by AES carefully qualify themselves with this text: "Our geotechnical evaluation was based on review of readily available geologic, groundwater and seismic data". Key words "readily available". What does that mean exactly? I was able to find more relevant site-specific data and I'm nobody. Also, CEC staff doesn't help the matter by just requiring the consultants to supplement their initial reports with excerpts from additional generalized environmental studies that staff actually points to.

Now to the crux of the matter. It's about the very basics of life here. The problems to solve are: 1) What is the source of the salt and fresh water of the Old Salt Lake, and, 2) What is the exact status of these sources.

People for a long time and across multiple cultures here have studied and wondered about the source of the salt and fresh water of the Old Salt Lake.

Let's continue this old tradition, right now, by comparing the following AES text in "Summary of Local Paleoenvironments" with the data from the 1890 Preston Report "Lake Salinas, Los Angeles County". I found this on-site report by a geologist in 1890 by examining the old California State Mining Bureau reports. Then, let's further compare the content of the AES text with Dr. Barbara Javor's take on the 1890 Preston Report.

[comment /]

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Applicant Data Adequacy Supplement_TN-69327

_____ 6. Summary of Local Paleoenvironments (Appendix B (g)(2)(C)) _____

"Many of the observed landforms along the shoreline in southern California in the nineteenth century consisted of low hillock dunes, generally less than 5 feet in height, which ran along the beaches. Vegetation generally consisted of red sand verbena and occasional salt bush and silver beach weed. Generally, written historical accounts agree that shellfish was very abundant, more so than at present, along the shore at this time. Estuaries were common on the land side of the small barrier spits along the coasts. Salt marshes and grass covered areas surrounded these estuaries (Engstrom, 2006).

As late as the mid 1800s, estuaries along the coast connected to the ocean via inlets. These inlets could be seasonal. In winter, they would be open and useable, frequently due to rain, while in summer heavy waves would create dams, which blocked ocean access. Heavy deposition of sediment during winter could also block inlet access. Once access was blocked, the evaporation of the water would result in alkali flats and high salinity in the water (Engstrom, 2006). The RBEP site, located at the edge of a historic Salt Lake, was likely one area of this kind of depositional activity and it is quite possible that the original formation of this salt lake was very much as described above."

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[comment]

This excerpt just quotes from environmental studies of the generalized area that CEC staff pointed the AES consultants to - in order to satisfy some regulatory requirement to show they were all doing their jobs and really drilling down into the crux of the local environment of the project site. It's affectation.

The AES position is not to think to hard about the original condition of the site because it's not scientifically interesting.

The fact is, the source of the salt of the Old Salt Lake, and significantly, the status of the source of the salt of the Old Salt Lake - is still, to this day, open for scientific inquiry. The inquiry begins with scrutiny of the original condition of the site. Turns out it is scientifically interesting.

For instance, I contacted the International Society for Salt Lake Research (ISSLR) about the matter. They expressed interest in and were kind enough to refer me to Dr. Barbara Javor, an expert in saline environments. She was nice enough to address my query – by providing her take (below) on the remarkable 1890 Preston Report "Lake Salinas, Los Angeles County". Dr. Javor's review of the Preston Report follows my transcription of the 1890 Preston Report along with the other old California State Mining Bureau reports with Old Salt Lake data.

[/comment]

Data based on new independent research

"California State Mining Bureau" - old reports filtered for Old Salt Lake data
[Selected text and photos transcribed]

Caption: SALT WORKS, REDONDO, LOS ANGELES COUNTY.

1901 photo of Salt Works. Photo taken by Gilbert E. Bailey and published in his 1902 report "Saline Deposits of California", California State Mining Bureau, Bulletin No.24, (page 111). See more text and images from this Bailey report below.

Note: This photo looking west, the ocean is on the other side of the great sand dune. On the dune (which, by the way, was some 20+ feet high) is a large iron tank - built some months prior, by Standard Oil Company for its oil-docking business right there.

1890, "Lake Salinas, Los Angeles County", by E. B. Preston, Assistant in the Field, California State Mining Bureau, Report X, (p. 281), California Geological Survey Library:

[*Transcribed*]

Lake Salinas

Within the town site of Redondo Beach is a small salt-water lake, about three hundred yards from the ocean, and about five feet above the high-water mark, that does not receive its water supply from the ocean, having an entirely different combination of salts, and has about it and its immediate surrounding features that make it of interest to the geologist and chemist.

The lake is about a half a mile long, and from four to six feet deep. At the south end is a large shallow basin connected by movable gates with the main lake, which is used for evaporating the water by the heat of the sun. The banks are low, gradually sloping up; a sand dune intervenes between the ocean and the lake; the bottom of the lake is a bed of clay. Around this lake on both sides, about thirty wells have been bored to an average depth of twelve feet into the clay that forms the bottom of the lake, and these all yield a good, soft drinking water. Between these sweet water wells next to the ocean, and the ocean itself, near the top of the dune a well has been sunk to a depth of twenty-six feet, which has passed through the clay for a distance of ten feet. The water obtained in this well is claimed as having medicinal qualities; it certainly tastes bad, if that is an criterion of its medicinal value.

The lake water is a much stronger solution of salts than the water from the open ocean, containing a very much greater proportion of chloride of magnesia; but the statement as made by the parties on the spot to the writer, that the water was ten times as saturated as the sea water, is evidently erroneous, as such a solution would pass the point of saturation. How to account for the presence of these different qualities of water in their relative positions, is not plainly to be seen. The salt water could be accounted for in several ways, as there are beds of saliferous shales and sandstones in the neighborhood; also, there are magnesian rocks on the flanks of the mountains surrounding the plain; but the fresh water in the wells surrounding the lake interferes, from the fact that these wells, terminating in the clay, compel the assumption that the water in them is drainage water from the near vicinity. To solve the question satisfactorily would require a closer investigation into the position of the different strata than the limited time at disposal afforded.

South of the town of Redondo Beach about three miles, the bluffs facing the ocean are composed largely of sandstones and shales, with a large bed of diatomaceous earth resting thereon; underlying these and running out to sea are beds of bituminous sandstones, showing natural bitumen in places. These continue in a southwesterly course out to sea as a reef for a distance of two and one half miles, at which point oil is seen coming to the top of the water in considerable quantities.

[/ *Transcribed*]

1902, Saline Deposits of California, by Gilbert E. Bailey, California State Mining Bureau, Bulletin No.24

[*Excerpt transcribed (page 122)*]

Salt works were erected some years ago near Redondo, on a small lagoon about half a mile north of the town. The waters of this lagoon contain a strong brine, but the work of making salt was interrupted first by one misfortune, and then by another. The works were equipped with considerable machinery, that was taken down and removed in the fall of 1901; and the present operations are confined to vat work and solar evaporation on a small scale.

At the present time, this business has been suspended for at least ten years.

[/ *Excerpt transcribed (page 122)*]

[Photo (page 120)]

SALT WORKS, REDONDO, LOS ANGELES COUNTY.

[Detail of map (folder in back of book)]

1916, Mines and Mineral Resources of Los Angeles County

[*Excerpt transcribed (pages 51-53)*]

SALT.

…

But one other salt manufacturing plant has been operating in this county. This was within the limits of Redondo Beach and was described as follows:

Lake Salinas, Redondo. In regard to this, Mr. E. B. Preston, writing in 1890, in Report X, p. 281, gave the follow description:

"Within the town site of Redondo Beach is a small salt-water lake, about three hundred yards from the ocean, and about five feet above the high-water mark, that does not receive its water supply from the ocean, having an entirely different combination of salts, and has about it and its immediate surrounding features that make it of interest to the geologist and chemist.

"The lake is about a half a mile long, and from four to six feet deep. At the south end is a large shallow basin connected by movable gates with the main lake, which is used for evaporating the water by the heat of the sun. The banks are low, gradually sloping up; a sand dune intervenes between the ocean and the lake; the bottom of the lake is a bed of clay. Around this lake on both sides, about thirty wells have been bored to an average depth of twelve feet into the clay that forms the bottom of the lake, and these all yield a good, soft drinking water. Between these sweet water wells next to the ocean, and the ocean itself, near the top of the dune a well has been sunk to a depth of twenty-six feet, which has passed through the clay for a distance of ten feet. The water obtained in this well is claimed as having medicinal qualities; it certainly tastes bad, if that is an criterion of its medicinal value.

"The lake water is a much stronger solution of salts than the water from the open ocean, containing a very much greater proportion of chloride of magnesia; but the statement as made by the parties on the spot to the writer, that the water was ten times as saturated as the sea water, is evidently erroneous, as such a solution would pass the point of saturation. How to account for the presence of these different qualities of water in their relative positions, is not plainly to be seen. The salt water could be accounted for in several ways, as there are beds of saliferous shales and sandstones in the neighborhood; also, there are magnesian rocks on the flanks of the mountains surrounding the plain; but the fresh water in the wells surrounding the lake interferes, from the fact that these wells, terminating in the clay, compel the assumption that the water in them is drainage water from the near vicinity. To solve the question satisfactorily would require a closer investigation into the position of the different strata than the limited time at disposal afforded."

Concerning this Salt Lake, Dr. Gilbert E. Bailey, in 1902, wrote in Bulletin No. 24, p. 122:

“Salt works were erected some years ago near Redondo, on a small lagoon about half a mile north of the town. The waters of this lagoon contain a strong brine, but the work of making salt was interrupted first by one misfortune, and then by another. The works were equipped with considerable machinery, that was taken down and removed in the fall of 1901; and the present operations are confined to vat work and solar evaporation on a small scale.”

At the present time, this business has been suspended for at least ten years.

[/ *Excerpt transcribed (pages 51-53)*]

1958, "Salt In California", Division of Mines Bulletin 175

[*Excerpt transcribed (page 15)*]

Salt Ponds. Preston (1890) has described an interesting salt pond that in the 1890's existed just north of Redondo Beach, and within 300 yards of the ocean. Lake Salinas, as the pond was called, has long ago been filled in. The pond was filled with a concentrated chloride brine having a much higher proportion of magnesium than sea water. Apparently no direct

connection with the sea existed, for the bottom of the pond was composed of fresh-water-bearing clay, and the pond level was about 5 feet above the high tide mark. The pond appeared to have received only the drainage of the immediate area, and perhaps it's saline content was derived from salt spray.

In 1901 and 1902, a company attempted to develop salt brine near Oceanside and Carlsbad, San Diego County. According to G. E. Bailey (1902, p. 133), brine was obtained from wells sunk in old, nearly dry lagoons. It would be interesting to know if this brine was merely sea water that seeped in from the ocean, or was, like the brine of Lake Salinas, of unusual composition.

[/ *Excerpt transcribed (page 15)*]

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2010, Analysis of 1890 Preston report on Lake Salinas, by Barbara Javor, Ph.D., Consultant to the solar salt industry, Author: Javor, B. 1989. Hypersaline Environments. Microbiology and Biogeochemistry. Springer-Verlag, New York, 328 p.

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“My take on the document is that the clay layer is an impervious zone that prevents the upper freshwater from mixing with the deeper saline water. Somewhere under the lake, the clay zone is likely breached, allowing the lake to fill with brine. Hence, a salt spring would never be visible to someone standing by the lake. It may not be a single point source either, but rather dispersed on the lake bottom as a large set of smaller percolation pores. Because the southern California coastal region has many petroleum zones on land (e.g., the oil fields in nearby Long Beach), it is not strange to find a buried saline aquifer bearing relict seawater from earlier geological times (i.e., possibly from the time of deposition of the marine organic matter that transformed into petroleum). The relationship between salt domes and petroleum deposits in Louisiana is a well-documented case of this phenomenon. Check out reports of oil drilling on land and you'll come across references to brines (google "oilfield brine" --- you'll get a lot of hits).”

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[comment]

Next is an excerpt from the 2007 environmental assessment of the site – by the West Basin Municipal Water District - for their current demonstration desalination project on the site.

Note the image below. The image shows “Contamination sources” at the site – the RBEP site - reaching the Manhattan/El Segundo Aquitard to the Silverado Aquifer at least. Evidently, the site is known to be polluted to the core. This pollution data is not in the AES Application for Certification.

My take is AES has an interest in redefining the history and geography and the actual geotechnical status of the site - as not scientifically significant - in order to control future remediation costs.

By the way, a desalination project on the Old Salt Lake site is classic historical irony. There are many levels of irony here and that’s scientifically interesting.

[/comment]

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2007, Draft Technical Memorandum, Appendix E, TM-2 Process Requirements Temporary Ocean Water Desalination Demonstration Project, West Basin Municipal Water District

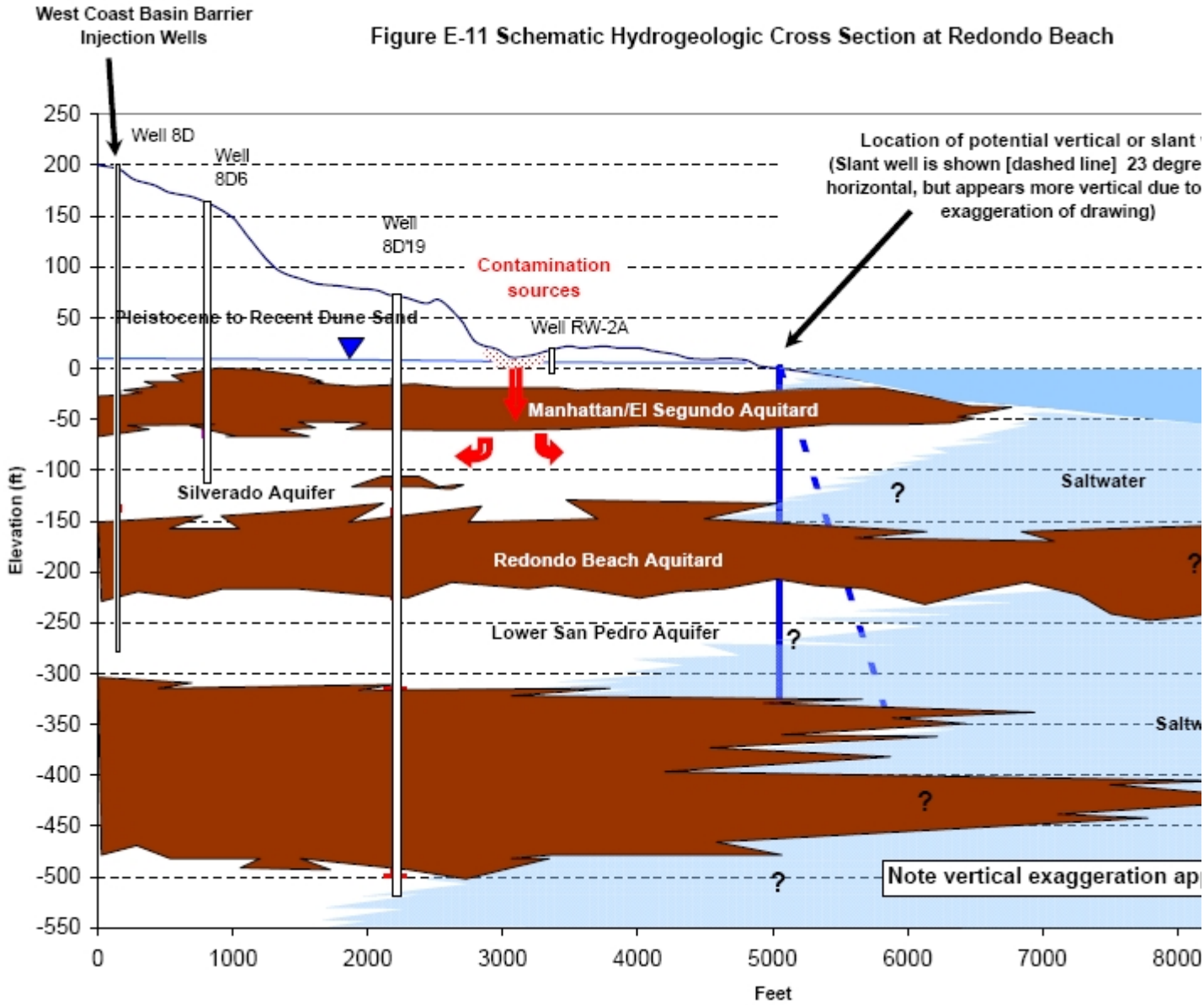
_____ Local Hydrogeologic Conditions Redondo Beach Site _____

[*Excerpt transcribed (pages E25, E27)*]

"In the Hazardous Waste Storage Area, carbon tetrachloride (13.6 µg/L), 1,1-DCA (22µg/L), benzene (12.7 µg/L), and trichloroethene (36.7 µg/L) concentrations exceed their respective USEPA MCL or CADHS Drinking Water Notification Level of 0.5, 5, 1, and 5 µg/L (CH2MHILL, 1997). Beryllium, cadmium, lead, and mercury were reported to have concentrations in the groundwater above the MCL but no values were given.

At the Solvent Wash Station, 1,1-DCA (20 µg/L), trichloroethene (25 µg/L), vinyl chloride (1 µg/L), and thallium (52 µg/L) exceeded their USEPA or CDHS MCL of 5, 5, 0.5, and 2 µg/L respectively. Lead and mercury concentrations in the groundwater at the Solvent Wash Station were also reported to exceed the MCL, however, no concentrations were given. Additionally it was reported to RWQCB in February 1987 that 180,000 gallons of wastewater was released from the retention basins. Of the 180,000 gallons of wastewater released, 80,000 gallons was discharged to the soil (CH2MHILL, 1997)."

…



[/ *Excerpt transcribed (pages E25, E27)*]

Suggestion about what is missing and needed to remedy the data inadequacy of the description of the geotechnical status of the Old Salt Lake site

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At the end of World War Two, Southern California Edison hired the great engineering firm Stone & Webster to design and build a new power plant at the Old Salt Lake site in Redondo Beach. Those Stone & Webster geotechnical documents of the site may be the only recent primary geotechnical resources describing the near original geography and geology of the place. The Stone & Webster geotechnical docs from Redondo Power Plant rebuild and expansion. The core boring logs, cross-sectionals, hydrology reports, etc., showing the original geology, topography and hydrology of the site. Not the building design specs. Just the geotechnical docs.

This would be the time to obtain and scrutinize all the early geotechnical records for this site and get the physical status right. As far as I can tell, nobody has bothered to obtain and examine, even account for, the Stone & Webster docs. Seems to me, these records should be a part of any adequate physical assessment of the place. The focus of the query being to try and determine the source of the salt and the status of the source of the salt of the Old Salt Lake.

Where are the Stone & Webster geotechnical docs?

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1946 photo inside Redondo Steam Station, engineering library, Turner & McBride of Stone & Webster.

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1946 Earthmovers working grading the Old Salt Lake.

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