

**LVHAC 8/21/14
DRAFT MINUTES**

California Energy Commission

DOCKETED

15-GRDA-1A

TN # 75337

MAR 06 2015

9AM Thermal Subcommittee

Attendees:

Nick Criss, Mono County
David Harvey, GIM
Jim Howle, USGS
Gene Suemnicht, EGS Inc
Michael Sorry, Ormat consultant
Cheryl Eanes, Ormat
Charlene Wardlow, Ormat
Jack Truschel, CA DOGGR
Mike Lystad, BLM
Collin Reinhardt, BLM
Bill Evans, USGS
Brent Calloway, Mono County

10AM Public Meeting

Attendees, all of the Thermal Subcommittee attendees plus:

Tom Cage, MCWD Director
Dennis Domaille, MCWD Director
Forest Cross, MCWD
John Foster, SWC
Hannes Richter, Resident
Timothy Donahoe, Resident
Pat Hayes, MCWD
John Pederson, MCWD
Karl Schnadt, MCWD
Irene Yamashita, MCWD
Stacy Corless, Mono County, Supervisor Elect

I. Public Comment

Request Public comment be moved to end of meeting.

II. Status Reports from Subcommittees

Thermal Subcommittee: discussed upgrades to wells, including shelters around wellheads to protect from climatic "noise" data, shelters went on three wells, questions raised about 28-49 if signatures were seasonal or equipment noise, and downward trend in pressure which is an indicator of injection well. 12-31 viability of static monitoring point, still open for discussion. 66-31 was a useful well before Basalt Canyon, problems with tubing construction, since 2006 it has been a noisy record, prevailing wisdom is it is not worth fixing but might be a good data point.

III. CD-IV Project Update

Reinhardt - No progress as far as project implementation, only changes are admin actions. Project has gone through appeal, waiting decision from IBLA, could be 6 months to a year. Since our last meeting EIR certified by GBUAPCD, and suits have been filed on EIR. BLM still working on monitoring plans that all agree on, two plans at forefront are shallow water and subsidence plans. Will set up meeting schedule with interested parties for monitoring plan approval.

Evans - Nighttime aerial thermography of entire mammoth area. Is going forward in October if funding comes from BLM and vendor is approved, a couple hurdles but optimistic it will occur before first snow accumulation. USGS does gas measurements every year, makes a temperature map updated annually. The aerial data would cover a much larger area. Would allow focused groundwork.

Hayes –JPL in 1992, talked with them they think they can make sense of it and would be good baseline, might pick up new thermal areas, steady migration westward from casa diablo towards shady rest park. BLM hosted a meeting on June 3 and 23, incremental progress made, first task was to have problem statement, has been completed, started discussion of objectives of monitoring, particularly water quality, District 100 percent supports starting monitoring immediately. Third meeting was anticipated, but 2 months have gone by with no meeting.

IV. Status review of the Sundry Notices for the groundwater monitoring wells

Reinhardt – Deciding what NEPA will be required, prefer to wait until full scope is agreed and avoid NEPA duplication.

Wardlow – Everyone agrees these wells are necessary, Ormat has agreed to pay for them, they need to be done before stress test, would push to get them in soon.

Hayes –Wells are a component of the USGS plan, USGS has recommended sets of wells, into the geothermal level, with monitoring in the hot, warm and cold zones, something around 4 wells needed.

Howle – Recommends that geothermal monitoring is in separate well, single bore could be used for warm and cold, but not feasible for all three zones.

Wardlow – We have two idle wells that should satisfy the need for geothermal, if those don't work we can move forward with a dedicated well.

Hayes – There was a static well, had structural problems, emitting H₂S gas, has been destroyed, there is no static well there now. The production wells that are idle are no longer idle when production begins, we think a true static well is needed.

Wardlow –We calculate dynamic data and it is adjusted to static, if everyone agrees that doesn't work we will drill a dedicated static well.

Hayes – Re well 12-31, district staff noticed door was open and no instrumentation, what is the status?

Eanes – Have been upgrading instrumentation, it is now operational. In process on other wells.

Reinhardt – Will tell managers they should move forward with NEPA for two wells.

V. Review of USGS data

Howle - Data focused on fish hatchery and mammoth/hot creek. Early concerns were impacts to fish hatchery spring temps. Springs are constrained by amount of water due to climatic fluctuations. Hot creek gorge considered a vital tourist attraction, early concern thermal features would disappear. This is unpublished provisional data, combination of flow, temp and chemistry, there is some limited interpretation. Data for two wells, hot creek gorge drilled in 1980s. Two new sites in Sherwin gorge now being monitored, also monitor spring discharge since 1980s. Calculate percentage of water that is thermal. Hot Creek flume continuous data, estimated thermal water discharge, reflects many inputs and is all over the place. Precipitation from Mammoth ranger station, monthly totals, last year, only 1 month above monthly mean, entering third year of below normal precipitation. Drought is likely cause of low discharge. Well level data, near historic lows, japan earthquake created a signal displayed in well level data, well was originally drilled to measure stress/strain for volcanic monitoring. Well LV19, east of

airport, large diurnal recharge typical, very slight two winters ago, almost no recharge this winter, clear indicator of lack of water input to system, at new record low. Daily mean flows at fish hatchery springs, spring distance from creek has effect on diurnal fluctuations due to groundwater influence, record currently not at record lows, was lower during 1992 during 7 year drought. CDFG was most concerned with temp, fluctuations represent tectonic and magmatic, but has essentially held steady, ideal for trout and Tui Chub. Calculated thermal water component at 2-3 percent, is at historic low, appears to be drought related. Thermal % changes in 1990s thought to be due to changes in injection depth, deepening of injection, less hot water entering shallow system. Since that change, has been pretty continuous, therefore springs are fed by shallow system. Hot creek flume discharge, near record low, creek temp is up due to lack of cold water, vegetation is disappearing. Gorge springs are difficult to measure, so collect integrated sample above and below springs, chloride and boron concentrations used to estimate thermal component, may be a shortcoming as chloride and boron concentrations may have fluctuated, but assumed to be stable, lots of discussion about drop in 2004 and recent peak...but no conclusions, this is a very complex system. Also collect from hottest spring, 96 C the hottest measured and it does change over time.

Hayes – Asked if USGS could provide formal write up with conclusions. Would like to see USGS report back on costs for comprehensive written analysis/report.

Howle – Not done in the past. We could, but not currently required or funded. Would be very complex lengthy process.

Sorey – the geyser period, 2006, enough public interest USGS did use data in published documents, funded “story” of shallow hydrothermal system, other factsheets published.

Suemnicht - data used/published in peer reviewed journals, info was published on all Ormat wells in 2007-2008

Wardlow – Ormat pays for current data collection, around 70k per year.

Reinhardt – BLM administration is concerned about the federal advisory act in how we participate, can't take an official advisory status.

Cage – if subcommittee sees a problem can LVHAC do anything about it?

Hayes – 2005-6 two new wells in basalt canyon drilled, was there a discussion about additional monitoring at that time due to proximity to groundwater? There was a recommendation that additional monitoring be done from Chris Farrar, July 22 2006, memo to committee, explains potential impacts from additional wells. Mr Farrar also submitted comments on EIS,

Sorey - monitoring that was in place at that time, shady rest soil temps, has enhanced monitoring on the west side. We put out an effort for more monitoring, while not a lot was published, some was. Might be time now to improve the monitoring, that data is made available to people on the LVHAC subcommittee.

Wardlow – BLM did address the water districts concerns in the Env documents.

VI. Review the outline for the monitoring plan

Dropped

VII. Drought Discussion

Hayes – Reported on drought conditions normally runoff is 200-220 cfs, this year did not exceed 25-30. have become reliant on groundwater, 75 percent of supply. Level 1 restrictions, about 14 percent

reduction community wide, several wells stressed need to be rested, model used has a worst case scenario of three year drought.

VIII. Report on LVHAC status including bylaw revisions, current membership and

Calloway/Criss - County website can host LVHAC. Will look for pre 1986 documents about LVHAC creation. Reviewed outdated bylaws and suggested some revisions. Group agreed bylaws will be reviewed and brought back to next meeting.

Resume public comment.

Cage – I hope this group realizes the moment of pause created by not sharing info. We can't sign non disclosures, we are a public agency. This community needs a sharing of info, if Ormat is so confident there is no issue, why won't they put together a complete monitoring plan with public data. Where is the competition?

Wardlow – We don't know if there is competition until there is an auction. There is currently no competition in CA because transmission capacity is lacking. Recent transmission line took 9 years to permit, there is a new north-south Nevada transmission. But there is a lot of land that could be leased and that is why the data must remain proprietary.

Truschel. There is at least one operator with a monitoring well, and they have made upgrades. So somebody is watching, gradient resources.

Howle- you might be talking about the USGS well, I don't know who the operator is, but USGS made the upgrade. It is part of Volcanic Hazards program.

Hayes – natural gas is low, fracking saving money, competition with geothermal, SCE has filled their AB 32 portfolio, no market to buy, wouldn't you have to send it somewhere else, you already mentioned lack of transmission, sounds like this project is not particularly viable. We have only one source of water, working with agencies that have a resource development view.

Wardlow – we have a purchase agreement with PG&E, the grid is interconnected we can send it anywhere. SCE is looking at upgrading the transmission. There are times this town has been an island when transmission cut to the South

Truschel - PG&E and SCE are investor owned, bill moving through that may require geothermal power for investor owned.

Truschel- Ormat has received geothermal lease maintenance award, only 1 operator can be given award each year, given to operators that have gone the extra mile with roads/maintenance etc.

Next meeting. Feb 26, 2015 10AM