

Final Meeting Notes: Community Advisory Group (CAG)  
Aerojet General Corporation Superfund Site Issues  
Meeting Date: September 21, 2016

**1. Introductions and Attendees**

Janis Heple, CAG Chair, began the meeting with introductions.

Attendees:

- Alex MacDonald, RWQCB
- Allen Quynn, City of Rancho Cordova
- Allen Tsao, Community Member
- Brian Rinde, Golden State Water Company
- Charles O'Neill, HDR – EPA Contractor
- Chris Fennessy, Aerojet Rocketdyne (Aerojet)
- Dan York, Sacramento Suburban Water District
- Jackie Lane, U.S. Environmental Protection Agency (EPA)
- Janis Heple, CAG Chair
- Jim Rohrer, Department of Toxic Substances Control (DTSC)
- Jimmy Spearow, Community Member
- John Valdes, Sacramento Suburban Water District
- Julie Santiago-Ocasio, U.S. Environmental Protection Agency (EPA)
- Kevin Thomas, Sacramento Suburban Water District
- Lynn Keller, U.S. Environmental Protection Agency (EPA)
- Stephen Green, SARA
- Tammy Teurn, HDR – EPA Contractor

Draft Meeting Notes from July 27, 2016

- J. Spearow mentioned a statement on page 6 regarding short-term exposure to pregnancy was labeled as a question; also had concerns about some missing dialogue [J. Heple and T. Teurn discussed solution to remove “Q:” from questions and statements and coordinated with J. Spearow on including the missing dialogue].
- C. Fennessy emailed edits on same section to T. Teurn before meeting and J. Spearow reviewed.

**2. Aerojet Community Updates – Chris Fennessy, Aerojet**

- Carmichael Water District and Golden State Water Company will hold an event to celebrate a pipeline completion project – a collaboration between both agencies to ensure long-term water supply; invite will be sent out (Janis on list).
- Aerojet won an Arkansas Environmental Federation Diamond Award for solar farm project.

**When is the celebration event happening?**

*C. Fennessy: I don't have a date and not sure if there is one, but I know they were shooting for October 19<sup>th</sup> or 24<sup>th</sup>.*

Per A. Tsao's request, J. Heple created a handout listing all Operable Units (OU), but added that Area 40 might become OU10. EPA confirmed this isn't official yet. In the meantime, Area 40 will remain as part of OU7.

### **3. Review of Operable Units (OUs) and Project Schedule – All**

J. Heple asked staff from the various agencies and Aerojet to briefly discuss the different OUs to ensure everyone is updated on what's located where, etc.

**OU3:** The purple line on site map is the extent of the Western Groundwater for OU3 (part that goes out over American River); Record of Decision (ROD) completed in 2002.

**OU5:** OU5 is second groundwater OU (OU3 was first and covered the western side and OU5 captured the north, south and east sides). ROD was completed in 2011. Aerojet has been working with agencies since then to design and install remedies for the area. Currently at 90% build-out according to ROD requirements, but there's ongoing evaluations of effectiveness that require additional extraction and monitor wells.

#### **Did OU5 end up involving some soil cleanup as well?**

*C. Fennessy: PGOU5 does include some soil sites (darker purple on map). One area requires soil vapor extraction to be completed (system was partially installed and being expanded) and the rest require land use covenants (to protect people from groundwater, recharging groundwater, land use covenant stating soil was excavated and a soil management plan is needed or vapor mitigation). Aerojet is working with agencies now to finalize these land use covenants.*

**OU6:** There are some sites within perimeter of OU6 (Boundary OU) that Aerojet wants to develop. Boundary OU is surrounded by carve-out property and Perimeter Groundwater OU sites. There are 35 sites and most are either excavation or capping. Remedies are in a process of waiting for EPA to issue an enforcement order and include land use covenants that C. Fennessy described. Superfund Unilateral Administrative Order (UAO) originally expected to be completed by EPA in Sept. 2016, but now it is anticipated in Dec. 2016 due to EPA's focus on the Five-Year Review. Proposed Plan completed in May 2013, ROD completed in July 2015.

**Area 40:** Following final RI/FS, Area 40 will be removed from OU7 and a new OU10 will be created for decision documents (RAP, mini-ROD, and CEQA), RD/RA, and O&M.

**OU7:** Worst contaminated soil sites grouped into Island OUs (green on site map) which are isolated locations with concentrated contamination. Initial RI conducted, but some data gaps need to be filled. Aerojet will be producing analysis for the Baseline Environmental Risk Assessment (BERA) to go through ecological risk assessment (1-2 yr. process) for seasonal sampling. Gaps will then be filled in for an RI and subsequent FS.

#### **The BERA sampling and analysis plan hasn't been finalized? Is it still going through review?**

*A. MacDonald: No, we just got the draft.*

**OU8:** Eastern OU: Investigated in 2007-2008. Data collected and sitting on shelf until everyone is ready to process.

**OU9:** Central OU: Sampling analysis plan developed in 2008. Received comments from agencies, but waiting for everyone to review and finalize.

**OU4:** Sampling and analysis plan submitted to agencies in 2014. Challenge: by the time an OU starts and finishes, the direction, screening levels, etc. changes so the approach needs to be developed again.

**On light green carve-out area, what is that?**

*A. MacDonald: Property removed from the Superfund site in 2002 and labeled carve-out property. Carve-out property was never used for aerospace type work, almost all buffer land between Aerojet operations and the public. Started as 3,200 acres then 400-600 acres removed during the carve-out process. Properties removed may not have met the criteria of not being used for industrial purposes. One example are Aerojet's landfills on the northeastern part of the property.*

**I was just wondering because right now there's a development, Westborough I think, that's coming in now.**

*J. Heple: It seems as though a piece of that development has gone into some of the Boundary OU.*

*A. MacDonald: Some of the sites are in Perimeter OU and some are in Boundary OU.*

*J. Heple: One development is pretty well in the carve-out land, but a small amount of it is in Boundary OU so that will be an important issue.*

**Do the boundaries of Westborough encroach on OU6 at all?**

*C. Fennessy: If you look at the map, the Westborough Development is all in the green area on the western side of the facility but it extends all the way up to Hazel Avenue along the eastern side, so portions of Westborough encroach into the Boundary OU. Specifically, Boundary OU sites in Westlake; Line 2 and Line 5 are part of Phase 2 of the Westborough Development.*

**Does the boundary between OU6 and the green area sort of fall into parts of the parcel boundary? Is everything in the green that borders OU6 the limit of that development?**

*C. Fennessy: The development includes the property that's yellow and doesn't go further south than the Boundary OU6.*

**For some of the areas that do overlap, are there restrictions that developers need to comply with?**

*J. Santiago-Ocasio: There are different restrictions for different areas.*

*C. Fennessy: Right now the developers are just asking questions about utilities and storm water in terms of our standards. The same folks that did development language for Glenborough (up in light green on northern side of facility that encompasses landfill area, a lot of small perimeter groundwater sites and part of Boundary OU6) are preparing EIR documents and maps for Westborough. All of the land use and pre-agency approvals language for development will likely be in there. C41 is an area within Glenborough Development that has a completed remedy*

*required by the agencies and has land use restrictions regarding impacts of soil deeper than 10 ft. Developers had questions, but were all answered.*

**So it's similar for Westborough, but there might be different contaminants at different depths so may not be exactly the same?**

*C. Fennessy: They'll be similar, yes.*

*J. Santiago-Ocasio: The basic language is similar but the specifics for each of the areas will vary.*

**Alex showed a series of different extraction wells around the perimeter of Western Groundwater OU but there was also another one somewhere, correct?**

*A. MacDonald: Aerojet has over 100 extraction wells. There are wells on the periphery or leading on edge of the plume. There are also wells back on Aerojet's property.*

**I heard somewhere that it would take about seven full water cycle exchanges for groundwater before it would be cleaned up which is estimated to be 200 years. Is that correct?**

*A. MacDonald: Charles Barry [a former EPA RPM] came up with an estimate on how long it would take - four or five flushes which would take 240 years. That's just off-site Western Groundwater and not anything on the property.*

**So just the stuff that's in the Western Groundwater then. Is that still a reasonable estimate?**

*A. MacDonald: Yes, it's as good as any because it has only been 12 years. You can't really tell if the original estimate is still appropriate based on the data collected to date. It takes many years of data to see what the trend actually is. You need at least 20-30 years of trend to see how fast it's cleaning up. So there is no basis to say it's going to be 235 years, it might be 280 years.*

**On OU5 and OU3 boundary, is it possible that it'll move since groundwater moves? Will the lines need to be revised?**

*A. MacDonald: The Western Groundwater boundary is not a fixed line, it is the extent of the plume. So, as the plume changes, the extent of the Western Groundwater boundary will also change. You're not just looking at the edge of plume, you're looking beyond the edge of plume. Other things can contribute or impact the remedy beyond the line.*

**This is an old map, but doesn't the plume almost reach up to Manzanita and Fair Oaks in OU3?**

*A. MacDonald: The extent there is fairly accurate. Right across from where it says Fair Oaks Boulevard, just below that and opposite of the Carmichael Water District.*

**Earlier this year you said you were going to put another extraction well or monitoring well in. Is that still happening?**

*A. MacDonald: That's on the agenda for later, which I'll get to after we get through this topic.*

**What's the status of Zone 4 of Perimeter Groundwater OU? Is it getting closer to Lake Natoma?**

*A. MacDonald: It currently doesn't show that it's getting closer. Aerojet will be putting in another monitoring well. We have two non-detect wells between the plume and river. They want to put in another one in the far northeast where the flow would go off that way.*

**Is the plume expanding?**

*A. MacDonald: If it is, it's expanding at such a slow rate that we can't see it in such a short period of time. The monitoring wells aren't that close together where you can actually see progress in a short period of time. We just received the report between the last meeting and this meeting, and it didn't show that the plume is making it to the river.*

**On the map, there are hashed areas within OU7 and a tiny bit of OU5 that says they're no longer owned by Aerojet. If it's not owned by Aerojet, would the full-on remedial design and cleanup be done by someone else?**

*C. Fennessy: The hatched area that overlaps OU7 is still owned by Aerojet, but leased to AMPAC Fine Chemicals.*

*J. Santiago-Ocasio: It's not that they don't own it, they don't have control since it's leased.*

*A. MacDonald: It's out of their control because there's a tenant there that's operating. There are things they have to deal with [active chemical plant operating within Superfund site].*

**We should make that correction on future generations of the map.**

*J. Santiago-Ocasio: This map is based on data from 2014. We've been waiting on an update, but it was created for EPA by a contractor who went bankrupt. EPA tried to get the files back, but they were charging us since they are owned by another company now. So, EPA has closed the contract. We will need to revisit the map and unfortunately redo one from scratch.*

**When might the map be updated?**

*J. Santiago-Ocasio: That's a good question and it depends on the contractor. EPA agreed to pursue a map update.*

**Is the other hatched area up near Zone 4 to the west of the landfill owned by Aerojet and leased out or what's going on there?**

*C. Fennessy: That area is already sold. The larger area is the Mormon center and the area on the northern and western side is smaller parcel of properties with an auto mall. Further to the west of that is a transit station and up on the northern side is AT&T property, I believe.*

*A. MacDonald: One portion is actually a dam there that Aerojet doesn't own. A long time ago when the previous owners were supplying water and dredging operations, they put a dam there to basically take water from there and the creek to supply operations. Aerojet doesn't own the area near the dam.*

**What creek is that dam on?**

*A. MacDonald: Alder Creek.*

**What is little circular island on the south side of OU5 perimeter boundary?**

*A. MacDonald: I didn't draw this map so I'm not sure.*

**The Zone 2 purple area south of White Rock Road, is that the Rio Del Oro Specific Plan area? Are there any issues with that major development?**

*A. MacDonald: The EIR has been done.*

*J. Heple: The IRCTS was owned by McDonnell-Douglas for a while and now by Aerojet.*

*C. Fennessy: For development purposes, the western side of the boundary is owned by Elliott Homes (not Superfund). Only a few areas remain on the eastern side are part of the State Superfund site. Issues have to be addressed before it can be developed. Easton Development Company is starting to think about how they might be able to get this project moving along.*

**What's the depth to the highest, most superficial TCE plume?**

*C. Fennessy: It's over 100 ft. I recently evaluated groundwater depth in this area. Groundwater migrates from northeast to southwest. Depth to first groundwater drops below 100 feet on the northeast corner of IRCTS and remains deeper than 100 feet across the IRCTS property.*

**Are there perched layers that are not contaminated?**

*C. Fennessy: Yes, we have a treatment system at the Propellant Burn Area, where we have treated groundwater and discharged to land. This has created an area where uncontaminated perched groundwater exists.*

**Does Aerojet own the IRCTS?**

*C. Fennessy: We own a part of it and Elliott Homes owns the rest.*

**4. EPA Update – Julie Santiago-Ocasio & Lynn Keller, EPA**

Status of Five-Year Review:

- EPA has had much internal discussion about what information to include. Review not complete, but the report will be signed soon. Congress requires that EPA conduct Five Year Reviews to ensure remedies are still protective by the end of the 5<sup>th</sup> fiscal year, which for Aerojet OUs 3 and 5 is 30 September 2016.
- Review will include a recommendation that the Aerojet site is targeted for a site-wide vapor intrusion evaluation. Review identifies OU6, OU5 and OU3 for vapor intrusion evaluation, but eventually will be for the entire site (based on new vapor intrusion guidelines issued in June 2015).
- The vapor intrusion review is a high priority for EPA, so staff is shifting priorities. A better update will be provided at the next CAG meeting. Preparing presentation to EPA core team for vapor intrusion on Nov. 10, 2016. Chris agreed to work with us and supply information for it.
- In July, EPA sent special requests to Aerojet for OU3 and OU5 regarding groundwater plume capture. Aerojet is in the process of evaluating the request for additional groundwater work/investigation.

**How can we access the Five-Year Review when it's done in September?**

*J. Santiago-Ocasio: It will be available on EPA's website as well as GeoTracker. We will also look into publishing a public notice in the newspaper.*

**Which newspapers will it be published in?**

*A. MacDonald: The Grapevine Independent, Carmichael Times, and Folsom Telegraph. J. Heple previously also requested the Sacramento Bee.*

**Will there be a link in the newspaper to the online location?**

*J. Santiago-Ocasio: Yes, there can be and we'll also send a link directly to everyone as soon as it's available.*

**When will we get information for the additional work that we've requested from Aerojet on OU3 and OU5 Groundwater?**

*J. Santiago-Ocasio: Some of that information will actually show up in the Five-Year Review report as well.*

**Does EPA have consultants to help with the Five-Year Review or is it all done in-house?**

*J. Santiago-Ocasio: The Five-Year Review generally was done by the US Army Corps of Engineers, who did the final draft and then EPA took it over to finish it.*

**Is EPA writing the Five-Year Review?**

*J. Santiago-Ocasio: EPA wrote portions of it, but changes were made based on comments received.*

**5. Area 40 Remedial Investigation (RI) – Chris Fennessy, Aerojet**

Walk through of compiled & released document

- Document focuses on investigation conducted to understand where chemicals went into the ground and how far they spread. Doesn't go into risk analysis of the chemicals or what will be done to remediate those chemicals, just an initial document gathering field work data to better understand how big the problem might be.
- Two copies of document here and copies at the Sacramento State Library and Downtown Library. Janis has a couple of discs and it's available online. Not sure if it's on EPA's portal, but Aerojet has a portal open to the public where the document is posted. If interested in viewing, email [christopher.fennessy@rocket.com](mailto:christopher.fennessy@rocket.com) for access.
- Document sections include:
  - Section 1: Background of Aerojet's site (where and who they are)
  - Section 2: Background on use of Area 40
  - Section 3: How data was analyzed (collected a lot of data including soil vapor, soil sediment, groundwater samples and how to use that data to determine what the nature of the chemicals are)
  - Section 4: Results of analysis primarily for soil and soil vapor
  - Section 5: Groundwater evaluation (where are the chemicals in groundwater, how far they moved and which direction they are going, how deep they are, etc.)
- There is an area within Area 40 where there was suspected irradiated propellant. Whether you call it fact or folklore, there's documentation out there stating Aerojet sent some propellant out to a test site in Nevada, where it was irradiated. A letter written in the 1970s suggests that this material could've been buried at Area 40 and the soil was supposedly picked up, removed and hauled to another site on Aerojet (G9 dump). Aerojet

conducted radiological investigation onsite and screened entire area to ensure radiation levels were not elevated.

- Developments are planned around this area. Developers are interested in the results of the RI/FS so they can understand the development restrictions that will be placed on the property by the State and USEPA.

(C. Fennessy then went over several maps and figures via PowerPoint)

**What's the yellow zone for?**

*C. Fennessy: It just identifies the source areas (there are five source areas).*

**Is that multifamily within the yellow zone?**

*C. Fennessy: It's all part of the site. The source areas are shown on top.*

**How big is Area 40?**

*C. Fennessy: About 70-75 acres.*

**You said your screening value is .0048 and the screening level for soil gas is 980. That figures out to over a 2012 attenuation factor. That's a lot higher attenuation factor than we normally use. That's a lot more than the DTSC one for example and also EPA's which is .03.**

*C. Fennessy: It's all based on site specific parameters. EPA's default attenuation factor is .03 and our site specific attenuation factor is .0048.*

**Is there heavy clay there?**

*C. Fennessy: It's silty clay and not sand that's for sure; definitely not EPA specific value. The soil moisture content in our soil is much higher than was assumed in the EPA model.*

**But if you have dry days, dry period of time, it's going to have less moisture or less attenuation then.**

*C. Fennessy: Perhaps, but on an average of a year you have certain moisture content and the risk is for a long term exposure.*

**Well not specifically for TCE, you have a short term component particularly to pregnant women. The fetal exposure for heart defects is relatively a short couple of weeks.**

*C. Fennessy: It's our job here to ensure that we protect those people.*

**Is that reasonable to have such a high attenuation factor there?**

*C. Fennessy: It's just a screening value. They're all plugged into risk analysis, which doesn't use Johnson Ettinger data. It actually plugs the data into risk equations to determine whether or not there's a risk there.*

**It's not a conservative value though?**

*C. Fennessy: We have a document that we're happy to share with you. It was reviewed by all of the agencies. A risk assessor prepared it and determined that it was overly conservative. The Agency risk assessors reviewed it and they were happy with it.*

**Was that a part of RI or another document?**

*C. Fennessy: It's a separate document that was done before this RI was released.*

*J. Santiago-Ocasio: As part of the vapor intrusion evaluation that's coming up, we're going to be looking at all these values.*

**That's not in itself the Five-Year Review, that's part of the recommendation?**

*J. Santiago-Ocasio: It is part of the Five-Year Review, but even if we didn't have the Five-Year Review at this time it was going to happen no matter what because this EPA Region is taking a closer look at all potential vapor intrusion (VI) sites and Aerojet is one of the last ones to be examined.*

**Will the site-wide vapor intrusion evaluation be a separate document from the Five-Year Review and has it been produced?**

*J. Santiago-Ocasio: Yes, it's going to be separate and no, we haven't even started. The first presentation we're giving to the core team is on Nov. 10, 2016 and it's going to take a while. It'll be down the road and part of the recommendations. We'll have to track it in our system separately so there are timeframes attached to the Five-Year Review for us to complete that evaluation.*

**Would the residential area be up from the line right there (referring to map)?**

*C. Fennessy: Essentially the green points are surveyed in on the southern residential property boundary.*

**You have one that's purple there. I can't tell what levels of TCE would be there.**

*C. Fennessy: That could be high. Our risk assessment and the agencies are going to figure out whether it's appropriate to have residential there and if it is, what remedies have to be put in place in order for that to happen.*

**Do you have any idea where there might be cracks in the bedrock that can be going up in that area and do you have samples near them? That could be a preferential pathway.**

*C. Fennessy: We don't know of any cracks.*

*A. MacDonald: All the fractured rocks are below the water table.*

**Was this area dredged?**

*A. MacDonald: No.*

**Was that a one-time sampling there?**

*A. MacDonald: The soil sampling was done over a period of time.*

**How much soil vapor data do you have for Area 40?**

*C. Fennessy: There's probably 110 soil vapor locations for Area 40 and there's multiple samples per location.*

**Some of the areas here had 20k-50k micrograms per liter of TCE in the groundwater. It was really shallow groundwater as I remember. Do you have any measurements on the levels of TCE in air, let's say one foot above ground in the middle of summer when it's really hot when you don't have much wind velocity? On those kinds of days, you can have enough TCEs coming up that would be in ambient air that would complicate the vapor intrusion issues in the adjacent houses or that are in the area there.**

*C. Fennessy: The risk assessment evaluated a model to determine what the concentrations from soil vapor would equate to in ambient air.*

**Do we have any idea the levels of TCE, the vapor coming off of that, that you'd be exposed to just in ambient air?**

*A. MacDonald: The risk assessment used a model for areas above the plume to figure out what the air concentration would be.*

**Has the Risk Assessment been completed yet?**

*C. Fennessy: We've submitted the final risk assessment to the agencies and are waiting for approval. The agencies approved all of our responses to their comments so we resubmitted the document with responses incorporated and as soon as that's approved, we'll publish it.*

**Is the arsenic background specific for Area 40?**

*C. Fennessy: No it's not. It's a site wide background, but there weren't a lot of samples collected for Area 40 or any specific background data set.*

**Do you have areas where groundwater daylight?**

*C. Fennessy: We get some standing water, but I wouldn't say it's daylighted.*

**How about the surface water flow? Is it dry during summers?**

*C. Fennessy: Yes.*

**Regarding ambient air, what results did they take in validating the box model to show it's applicable to the site? Particularly summer conditions when it's dry and hot, do you expect more of the TCE to be going on?**

*C. Fennessy: I'm not sure, I'm not a risk assessor. Hopefully the risk assessment (RA) will be out soon so you can take a look.*

Note: Might be a good idea to have EPA's risk assessor attend a CAG meeting once the site-wide vapor intrusion data is available.

## **6. Regional Board Aerojet Cleanup Overview – Alex MacDonald, RWQCB**

Note: A schedule and map were distributed.

- Question was asked earlier about the potential for additional extraction wells in Carmichael area: looking at northwest corner where it says "remedy enhancement evaluation," the next group of wells will go in at end of this year.
  - Yellow diamonds with black boxes: monitoring well locations Aerojet completed. Information help determine that additional well locations were needed.

- Yellow diamonds without black boxes: Aerojet in the process of getting those established and permitted by the county to locate where to put in an extraction well. Need to be precise on location due to cost and pipeline construction to a treatment plant.
- Towards middle near Well 1186 (needs to be corrected to 1156): two diamonds haven't been filled yet, one in corner is a lower priority well that needs to wait. Just southwest of there is a sentinel well for the Golden State Water Company along American River near Sunrise Boulevard.
- Three other wells going in on Aerojet property: two replacement wells will be destroyed (where Aerojet is having development) near C29 and C41. Southwest of there is a diamond extraction well for conducting a pilot test.
- Aspen Grove Mobile Home Park: has own water supply well and Aerojet is conducting engineering for hook up to California American Water. Perchlorate has been sampled six times in past 1.5 years finding trace levels in well so they want to get replacement in before levels go up.
- GET HA/GET HB: wells around there are being put in as part of the IRCTS remedy to ensure plume is defined at all different layers (B, C, D and E). These wells define the plumes to make sure the extraction system captures everything necessary.
- County is looking at selling some of their property for development and is reluctant to let us put in monitoring wells in those locations. County owns property and can say yes or no so we're working with them.
- GET EF: fully built out and up to capacity. Aerojet bringing on all wells they can and PBA spray field wells (six down there) will be operating within next month.
- Number of reports currently in for review, including:
  1. Area 40 FS
  2. Standard Operating Procedures Update
  3. PGOU Zone 1 and 4 Evaluation of Effectiveness of Extraction System
  4. Final Area 40 Human Health & Ecological Risk Assessment (HHERA)
  5. Islands OU (OU7) Baseline Ecological Risk Assessment Sampling & Analysis Plan
  6. Inner Barrier Evaluation Report (for Western Groundwater, OU3)
  7. Second Quarter Compliance Monitoring Report (for Western Groundwater, OU5)
- Sampled Aerojet's GET EF and AB systems for perfluorinated compounds and found some. Aerojet took 70 samples of groundwater extraction treatment systems and based on that information will be evaluating where it's coming from, whether treatment is needed, what zone it's in, etc. Will take a few weeks for data to come back.

## 7. Next Meeting Date

- Wednesday, November 16, 2016 (City Hall, American River South Room)