

VB/I-70 Superfund Community Advisory Group (CAG) Meeting Notes

Date of Meeting: Tuesday, July 18, 2017

CAG Members Present:

Joan Seeman (for Lloyd Burton), Candi CdeBaca, Kim Morse, Mike Dugan, Vernon Hill, Drew Dutcher, Roberto Eaton, Tad Bowman, Jim Garcia, AE

CAG Members Absent:

Kenia Abeyta, Cliff Lind, Lloyd Burton

Ex-Officio:

Jack Paterson (Council), Steve Wharton (EPA), Jessie Aviles (EPA), Jeannine Natterman (for Fonda Apostolopoulos) (CDPHE), Jenny Luthi (Denver), Kerra Jones (Denver), Celia VanDerLoop (Denver), Gene Hook (Denver), Andrew Ross (Denver), Michael Ogletree (Denver), Andy Whitty (Denver, note-taker)

Ex-Officio Absent: Chy Montoya (Council), Rodolfo Rodriguez (Council)

Facilitator: Elizabeth Suárez

Introduction:

Ms. Suárez welcomed everyone; the CAG and Ex-Officio members present all introduced themselves with their affiliations. Dr. Stephen Eppler introduced himself as a member of the public. Ms. Suárez introduced the interpreters. Ms. Suárez then provided an overview of the main topics for the upcoming meeting:

1. Mr. Burton's bylaws proposal and Ms. Chergo's voting/membership proposal
2. Globeville Landing Outfall Construction Update
3. Liner Discussion led by Ron Frobel, R.K. Frobel and Associates
4. Round Robin and CAG Open Discussion
5. Open community dialogue beginning at 7:15

Ms. Suárez noted that the agenda was full and if items went long, some items might be carried over into the next CAG meeting.

Kim Morse requested, and Mike Dugan seconded that the discussion and vote on Mr. Burton's bylaws proposal be deferred until his return in August. Likewise, Ms. Chergo's proposal regarding voting, membership criteria, and the mission statement discussion be tabled until the next meeting.

Ms. Seeman and Ms. Morse suggested an extra meeting to address these issues; Mr. Bowman and Mr. Eaton shared concerns for attending another special meeting. A doodle poll was suggested for this special meeting.

Ms. VanDerLoop suggested that, due to logistical concerns, it would be difficult to circulate a doodle poll, get responses, and get a separate meeting scheduled before the next meeting, August 8th. She suggested that the group get as much done as possible at the August meeting, and if needed, schedule a special meeting after that. The group agreed, and reached a consensus to devote a significant portion of the August meeting for these discussions.

Globeville Landing Outfall Construction Update: (Ms. VanDerLoop, Denver)

Ms. VanDerLoop provided a presentation in which she discussed the support columns, dewatering, water treatment, waste management, and air monitoring. As of June 30, crews have installed 1100 grout columns beneath the piping/culverts and 575 stone columns beneath the liner area. Dewatering efforts have continued, in order to create dry working conditions for the culvert and liner installation. Crews have isolated high areas of groundwater with temporary sheetpiling, while also utilizing temporary trenches and well points to extract water, ~70-80 gal/min in total. The water is hauled to McDonald Farms and treated. The liquids are being treated for subsequent discharge into the stream. Solids settling and filtration, chemical precipitation, biological treatment, then filtration comprise the main phases of treatment. The treated water is discharged, and the solids are removed. All treated water has met the permit requirements for As, Pb, Se, N, and E. Coli levels. Nitrogen has proven the most difficult treatment element. E Coli is a living organism, so it is presented in different units.

Mr. Hill: What's the depth of the sheet pilings?

Ms. VanDerLoop: I'm not certain; I believe that they are driven down to refusal which generally means bedrock; they are one continuous piece of metal—probably about 40 feet in length.

Ms. Luthi: They are driven down to bedrock. Waste materials: ash, construction debris including acm (asbestos containing material), metals containing soils, woody debris, and general municipal trash have been excavated and disposed at the Denver Arapahoe Disposal Site, ~110,00 cubic yards as of June 30. For air monitoring, Denver's goal is to measure and ensure air quality around the site. CABIs are onsite performing visual dust monitoring, and Denver is monitoring for PM10, as well as metal levels for lead and arsenic (1 in 6 day frequency), Asbestos, Methane in the work zone, VOCs in the work zone, and odors. EPA is monitoring for PM 2.5. Although EPA guidelines suggest air monitors be positioned twice the distance that nearby buildings are tall, the site layout doesn't allow for this possibility while at the same time having the monitors be close to construction activities. The decision was made to have the monitors close to construction activities instead of moving them the significant distance away that would be required in order to be in an open area twice the distance that nearby buildings are tall. Air monitoring experts with CDPHE, EPA, and Denver provided input for the selected air monitoring locations.

Mr. Dutcher: Is the concentration presented (150) an average of the concentration over 24 hours? Are the OSHA requirements presented covering 8 hours? Where is the air monitoring data available?

Ms. VanDerLoop: This is the OSHA standard which cannot be exceeded. I believe it is a 24 hour average. That is not the measurement. The detailed air monitoring results are available on the DEH website.

Mr. Ogletree: It is a 24 hour average, and it is a limit that cannot be exceeded.

Ms. Morse: It would be helpful if the information were more centralized in a single location.

Ms. VanDerLoop: We don't have the ability to control the EPA's content. We want to make sure it is available at a location on the city's website, and we provide the information to EPA as well.

My understanding is that Ms. Chergo had said that it would be difficult to consolidate. The city site is the DEH website -> (Environmental Land Use and Planning) -> GLO.

Ms. CdeBaca: Could you add a link to the EPA site?

Ms. Jones agreed to make sure a link is available and set this up.

Ms. Seeman: This is a national Superfund site. It's unusual for the PRP – Denver to present all of the information to the CAG. We're responding to all of the project activities after the fact. We've never seen a map with CDOT's plans for piping on the site (handout distributed by Ms. Seeman). The locations of the grout columns are changed. Does the grout include fly ash? Why did the water treatment location change from on-site to off-site? Why did the water discharge permit change?

Did we change this site from commercial/industrial to parking lot, parks (zoning change)?

Has many questions which will be sent to Kerra Jones by Friday.

Ms. VanDerLoop: There has not been a land-use zoning change on this land as a part of GLO. The National Western Master Plan contemplates the further development of this site, and a changed long-term use from the previous anticipated use as a parking lot. We're hoping to accomplish with this CAG a process to select a cleanup remedy needed to enact these long-term land use changes. Also, the approved plans show the locations of the grout columns.

Mr. Bowman pointed out that there had be a recent land use zoning change as the property was part of the National Western re-zoning. Ms. VanDerLoop agreed that she had forgotten the National Western re-zoning and she would need to confirm the zoning. Both she and Mr. Bowman believed that the prior zoning had been commercial/industrial.

Mr. Bowman: What are the initial readings on the graph?

Ms. VanDerLoop: Those are background conditions before construction started.

Mr. Bowman: Why are there peaks and valleys in the graph lines (air monitoring data)?

Ms. VanDerLoop: #1 and #4 air monitors generally measure background, while #2 and #3 are measuring site conditions. Recognizing that wind direction does change, the predominant wind direction is from the southwest to the northeast. This data requires some interpretation, to accommodate for natural variabilities due to the day of the week, precipitation, and wind patterns, etc.

Mr. Ogletree: The predominant wind directions are recorded hourly in addition to the air data as well as any other anomalies. Arsenic instrumentation has recorded many values as below detection limits, which are represented here with the detection limit number. Low winds might contribute to lows in PM detections. There are nearby stations (CDPHE), also on a 1 in 6 day cycle, in the area to compare and validate the results.

Ms. VanDerLoop: We can provide a presentation on the air monitoring and results, or put together something to compare results to those found at various monitors around the city.

Ms. Seeman: Why was there no independent engineering review and cost analysis performed by Denver for GLO. Many changes have occurred, and no risk assessment, worst-case scenario, cost assessment, or engineering evaluation has been performed. The Delgany Interceptors are being moved. There was no independent review.

Ms. VanDerLoop: A risk assessment was prepared as a part of the previous RI (remedial investigation) process. A Consent Decree was signed between EPA and Denver. The Delgany Interceptors are not being moved. One was taken off line during construction. Denver prepared a design, provided plans to EPA and CDPHE for their review, and EPA called on CDPHE for an independent review of the liner; all documents were reviewed and approved. CDPHE is independent of Denver. EPA is independent of Denver. This design reflects standard, established engineering practices.

* Per Request, Action Items will be tagged for questions that are posed and not answered.

Liner Discussion: (Mr. Frobel)

Mr. Frobel provided a presentation on the GLO lining system. It's a lining system because everything works together: soils, liner, components.

Mr. Frobel designed the liner system for the GLO, to isolate the surface water and ground water systems from one another. He presented his extensive experience and credentials in the field of geosynthetic engineering science. In geosynthetic terminology, -geo represents soil, and the synthetic aspect serves

to improve conditions within the soil. At GLO, the geomembrane material will cover over an acre in size. Mr. Frobel explained how this geomembrane was selected, as most suitable to GLO site conditions. A geomembrane (liner) is a nearly impermeable (10^{-11} to 10^{-13} cm/sec) geosynthetic material composed of one or more synthetic sheets. Major types include PVC, Polyethylene (HDPE, LLDPE), Thermoset Polymers (rubber like Elastomers), and thermoplastic Elastomers, amongst others. Advantages of geomembranes include uniformity (elevated manufacturer quality control), ease of installation, established methods and standards, low permeability, proven historical performance, and a 100 year life-expectancy when buried. Their primary application targets waste containment, and for good reason. Design considerations at GLO included type of containment, slope (lower angle), durability and constructability of the geomembrane, anchors/connections, construction quality assurance, and Electrical Leak Location final acceptance. This final test reveals any holes in the membrane as small as a pinhole and can be performed in the future. At GLO, the liner serves as a cover over the groundwater and a liner for the surface water, a dual component system. The GLO subsurface is comprised of low shear strength soils, unstable; the stone columns design from CTL Thompson serves to stabilize the subsurface and prevent settling beneath the liner system. An additional strengthening layer—including a geogrid layer and 18" of #57 stone layer— provides the final bedding for the lining system. The geotextile directly below the geomembrane (liner) serves to protect the underside of the liner. A Geonet sits above the geomembrane to direct surface water for discharge. Three to five feet of cover soil will be placed above the geonet. Concrete walls on the side will protect the liner from trees and other roots. All of these layer components work together. An orange grid will be placed 2 feet above the geogrid to provide a warning indicator to future excavators that the liner sits below. The orange grid also will serve as warning in case of flooding that erodes the overlying soil. On the side slopes, the textured surface of the geomembrane holds the soil and liner in place. The 22.5' wide rolls of Polyethylene will be laid out and overlap by a minimum of 4-6"; the seams are then thermally welded. Low density polyethylene was selected for long term durability and flexibility to accommodate any settling. There were no chemical compatibility concerns at GLO. Burial of the lining system protects against UV degradation. The seams will be double tracked to create an air channel with automated machines that record temperature and other variables. A final Inflation of the seam channels ensures an air-tight seal within the seams. Stainless steel hardware will secure the geomembrane to the concrete walls. Quality assurance by manufacturer, installation contractor, and engineer, followed by electrical leak location creates redundant QC checks to ensure the integrity of the final product. A change in electrical current density will readily identify any failure points in the lining system.

Mr. Hill: How deep do the stone columns go and how is the liner connected? Moisture in the overlying soil could undermine the connection points (to the concrete wall). Monitoring and testing must be in place to guarantee the long-term success of the liner system. The liner manufacturer warranties the material for 20 years, but it needs to be tested consistently. Who will be responsible for this monitoring and testing?

Mr. Frobel: Vibrations settle the stone columns down to the bedrock; the liner is attached to the concrete walls, as well as supported by the stone columns. The liner system is designed to accommodate some settling, and the strengthening layer also will reduce settlement. Electrical testing would reveal any faults in the liner connection. A long-term maintenance plan can ensure the integrity, which I do recommend. LLSI contractors specialize in the electrical testing.

Ms. Morse: Concerned with the long-term viability of the system. The EPA has stated that in the case of landfills, the underlying layers have been known to deteriorate through time. Who will be responsible for the long-term monitoring of the liner system? Who is on the hook in case of future problems?

Ms. VanDerLoop: The short answer is -- Denver will be responsible.

Mr. Dutcher: Who is the manufacturer of the liner? Can you cite other locations where this material was used?

Mr. Frobel: It's out for bid, likely Agruamerica or GSE Environmental. Absolutely, probably most landfills in the US. We used this material in Delaware recently to line a 50 acre, 50 ft. deep reservoir. There is a 20 year warranty for manufacture, and 2 year warranty for the installation contractor, but this product should last much longer, likely over 100 years. However, there are contractors that make errors resulting in issues within the first year.

Ms. Seeman: In your career, you have responded to liner failures. Liner failures have been going on for years, namely due to installation, but also for a plethora of other reasons. Your final design report comments were important. Landfills, such as GLO, are inherently unstable, requiring extensive modifications. Differential settlement of more than 6" can compromise the liner. Impermeability of the liner is a misconception that several agencies have been promoting.

Open Public Discussion:

Mr. Eppler: The principle purpose of the membrane is to separate the contaminated groundwater from the surface water. To what extent will the groundwater flow characteristics be changed due to the stone columns, with a resulting increase in the leached As and Pb that will enter the S Platte river?

Mr. Frobel: Water can move through the stone, which is why they were selected. The effect should be minimal.

AE: Requests a formal presentation on the fail-safe aspect of the liner. Seconds Ms. Morse's comments. Seeks reassurance that an optimal budget is created for the testing and monitoring of the liner system to address unique liabilities of the site. (To Mr. Frobel) Were you presented with budget constraints that compromised your best judgements as a practicing engineer during this project?

Mr. Frobel: No

Mr. Eaton: What is the permeability of the membrane?

Mr. Frobel: $10 E^{-11}$ to $10 E^{-13}$ cm/sec. That is a calculated permeability; this can't be measured by conventional methods. In essence that is water moving at a molecular level it is so low.

Ms. Morse: For the record, since last fall I've asked Dania Zinner several times for the halt of this project until an environmental feasibility study is completed. Denver's 2014 Montclair Basin Feasibility Study stated that the environmental impact study would not be completed as it would impede CDOT's I-70 construction schedule. I feel that the city and CDOT have prioritized their construction project ahead of the health and safety of local residents and visitors, and am asking for the halt of this project until the study is completed.

Mr. Patterson: Are there other ASTM standards that govern the anchoring, bolting, etc.?

Mr. Frobel: Yes -- Volume 4.03, and other standards will be followed to guarantee all of these standards throughout the process.

Ms. Seeman: I asked last meeting for an analogous location that exhibits the same site condition and logistical considerations, handling both regional storm drainage and landfill stabilization with a

membrane system. Pepsi's stormwater management will be changing and will be directed into this system.

Mr. Frobel: I have never personally worked on a project that incorporates regional storm drainage, a lining system, and landfill stabilization at another location.

Mr. Eaton: There are no changes to the Pepsi structures. Pepsi uses a different outfall near Arkins, not the outfall at GLO for storm-water drainage. This is only the Pepsi storm-water under discussion.

Ms. VanDerLoop: There is an existing storm-water concrete channel that will tie into the new lined area. I don't know the specifics of Pepsi or where Pepsi's stormwater discharges, so I don't know if it discharges into the concrete channel. If Pepsi storm-water currently drains into the concrete channel, then that water will move into the new GLO system after the project has been completed and the existing concrete channel is removed.

Ms. Seeman: Requests information regarding Pepsi's storm-water permits, as well as the current and future path of Pepsi's storm-water. Suggests that stormwater permits for neighboring businesses be reviewed.

Ms. Suárez: The next meeting is Aug 8, same location, we're out of time, we need to let the facility close, a draft agenda will be sent out ahead of time. Good night.

Potential topics for next meeting:

Discussion of Mr. Burton's proposed by-laws

Discussion of voting procedures

Discussion of CAG membership

GLO air monitoring and results

Mechanisms to test liner performance in long-term

Discussion of long-term responsibilities