



STATE OF NEVADA

Department of Conservation & Natural Resources

DIVISION OF ENVIRONMENTAL PROTECTION

Jim Gibbons, Governor

Allen Biaggi, Director

Leo M. Drozdoff, P.E., Administrator

August 5, 2010

Mr. Brian Spiller
Stauffer Management Company LLC
1800 Concord Pike
Wilmington, DE 19850-5438

Mr. Joe Kelly
Montrose Chemical Corporation of California
600 Ericksen Avenue NE, Suite 380
Bainbridge Island, WA 98110

Mr. Curt Richards
Olin Corporation
3855 North Ocoee Street, Suite 200
Cleveland, TN 37312

RE: July 15, 2010 NDEP/OSSM Technical Groundwater Meeting Minutes

NDEP Facilities ID# H-000536 and H-000540

Dear Sirs:

The Nevada Division of Environmental Protection (NDEP) submits the attached final meeting minutes from the referenced meeting.

Should you have any questions, please contact me at (702) 486-2850, extension 252 or wknight@ndep.nv.gov.

Sincerely,

William Knight, P.E.
Staff Engineer III, Special Projects Branch
Bureau of Corrective Actions
Fax: (702) 486-5733



cc: Jim Najima, NDEP, BCA, Carson City
Greg Lovato, NDEP, BCA, Carson City
Jon Palm, NDEP, BWPC, Carson City
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Paul Sundberg, Montrose Chemical Corporation
Curt Richards, Olin Corporation
Michael Bellotti, Olin Corporation
Cindi Byrns, Olin Corporation
Lee Erickson, Stauffer Management Company
George Crouse, Syngenta Crop Protection, Inc.
Ed Modiano, de maximis, inc.
Lynne Preslo, GeoEco
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Nicholas Pogoncheff, PES Environmental, Inc.
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Meeting Minutes

Project: Olin-Stauffer-Syngenta-Montrose (OSSM or “the Companies”)
Location: Washoe County Department of Water Resources
Time and Date: 10:00 AM, July 15, 2010
Meeting Number: NA

In Attendance:

NDEP: Greg Lovato, Bill Knight
McGinley: Brian Rakvica, Brian Giroux (for NDEP)
Hackenberry Assoc.: Paul Hackenberry (for NDEP)
Hargis: Brian Waggle (for OSSM)
Independent: Paul Sundberg (for Montrose)
AMEC: Kelly McIntosh (for Syngenta)
Stauffer: Lee Erickson
Syngenta: George Crouse
Olin: Curt Richards, Mike Bellotti
Geosyntec: Lynne Preslo (for Montrose and OSSM)
PES: Nick Pogoncheff (for Stauffer-Syngenta)
de maximis: Ed Modiano (for OSSM)

The purpose of this meeting was to review and discuss technical issues related to groundwater characterization and clean-up levels, the operation of the groundwater treatment system (GWTS), and to discuss the schedule for tracking groundwater-related Deliverables and activities.

1. The meeting opened with a discussion of the adequacy of the existing lines of evidence regarding the performance of the GWTS. NDEP noted that the KT3D-generated groundwater contours and flow nets were a helpful addition. NDEP noted that modeling that showed capture in three dimensions (3D) would be also be useful, particularly if groundwater will be extracted from deeper zones in the future, but is not required at present. The Companies noted that the groundwater data obtained from additional monitoring wells to be installed as part of the Upper Muddy Creek formation (UMCf) characterization would provide additional evidence of capture. NDEP noted that the KT3D model produced good results using extraction well water levels if there are an adequate number of monitoring wells in proximity to the extraction wells. The Companies will consider this as they evaluate the influence of the GWTS on the UMCf.

2. NDEP noted that the KT3D model does have limitations regarding the “drift” term for well fields with lower numbers of wells. This may be an issue when evaluating the UMCf. Piezometers may help resolve this, however, the Companies should evaluate and discuss this. The Companies noted that the first step in evaluating the UMCf would be to look at heads, gradients and chemical concentrations. NDEP concurred.

3. There was a discussion of current capture by the GWTS extraction wells. The Companies noted that the results from the KT3D model for the eastern side of the groundwater plume indicating that there is not complete capture may be inaccurate. The Companies will sample and test well MW-111. However, they noted that a number of monitoring wells east and north of this area have been consistently dry for an extended period. NDEP requested that the Companies verify the screened interval in these dry wells versus the lithology. NDEP has an outstanding comment dating back to the 2007 intra-GWTS area investigation stating that the new wells did not screen the entire Shallow Zone (the saturated portion of the UMCf was not screened). The NDEP asked how many particles were injected in the KT3D model. The Companies will verify and get an answer to the NDEP (ACTION ITEM).
4. The Companies noted that the flows in each section of the injection trench are monitored and adjusted to approximate the extraction rates of groups of nearby wells. The injection trench is currently manifolded into three main sections (east, center, and west). The east and west trenches are further divided into three subsections each. It was also noted that the Companies attempt to mirror the volume injected to that is extracted along the east, center, and west portions of the extraction well field. Also, the Companies track the injection volumes at the center trench in an effort to improve capture efficiency in this area.
5. Discussed various contaminant contour maps as follows:
 - a. NDEP noted that the Companies need to review and discuss the sampling techniques for AMPAC wells. AMPAC has built in Waterra pumps in some wells and these pumps induce low bias for VOC sampling (ACTION ITEM).
 - b. NDEP noted that wells H-49A, MW-AJ contours appear to be connected to the well "J" area. NDEP noted that this was observed for at least chlorobenzene and benzene.
 - c. NDEP inquired as to why gamma-BHC was plotted instead of beta-BHC. The Companies noted that gamma has an USEPA MCL. NDEP requested that beta-BHC also be plotted as it is more toxic and prevalent.
 - d. Discussed well AA-MW-13, it was noted that arsenic and uranium appeared to have a multi-order of magnitude reduction since 2009. NDEP noted that this needs to be looked at carefully, discussed and likely resampled. The 2010 annual GW report will discuss this matter (ACTION ITEM).
6. The NDEP suggested that the Companies plot ORP, dissolved oxygen and pH data to evaluate whether or not a reducing environment may be mobilizing metals from the formation into groundwater (GW).

7. NDEP inquired as to the definition of the "Downgradient Area" from yesterday's slides. The Companies noted that this was just for presentation purposes and the "Downgradient Area" definition from the RAS Process Document has not changed.

8. The Companies asked how they could select specific site-related chemicals (SRCs) to truly represent the complete SRC list to limit the number of constituents addressed in the GW RAS process. The NDEP suggested that they either develop a protocol for screening SRCs which the NDEP agreed to review or evaluate the list of SRCs and develop a technical justification for including/excluding each constituent. It was further suggested that the Companies consider and discuss the following:

- NDEP BCL and USEPA MCL ranking
- Physical chemical properties
- Frequency of detection
- Concentration-toxicity screening
- Treatment technologies

9. Discussed inorganic compounds. It was noted that the establishment of upgradient and/or background conditions is critical. NDEP also discussed that permit conditions need to be considered for this matter and provided examples as follows:

a. UIC Permit, permit conditions will vary depending on the geographic location of the injection. The Companies need to review this matter and consider options.

b. NPDES Permit, for some compounds, a NPDES discharge to the Las Vegas Wash may be more favorable than upgradient conditions (e.g. arsenic and TDS). For other compounds (e.g. organics), the permit conditions may be unfavorable.

c. NPDES discharge to the Pittman Bypass Pipeline, perhaps the Companies could consider this as a cost-effective option given the large amounts of dilution water in this pipeline.

d. NPDES discharge to the City of Henderson POTW, the Companies would need to discuss with the City and also consider permit limitations for the sewer permit for the BMI Complex (flow rate limitations).

e. NDEP inquired if the Companies monitored the cumulative discharge concentrations for inorganics and other compounds. The Companies do not. NDEP noted that this should be considered as it will directly affect the evaluation of permit options.

10. Discussed the issue of transport between the Middle and Shallow Zones. NDEP is concerned that the strangeness of the shapes of the Shallow Zone plumes may be due to transport from the Middle Zone to the Shallow Zone. NDEP noted that the Middle Zone

appears to have a greater NE angle to it than the Shallow Zone. The Companies indicated that the plume figures are in draft format and will be finalized to better determine plume shapes as part of the 2010 site wide monitoring report.

11. Discussed the Shallow Zone DNAPL detection in the Former Tank Farm. This was missing from the slide presented yesterday. The Companies will look into this and modify Figures accordingly in the future (ACTION ITEM).

12. The Companies equivocated regarding submitting a Gantt or CPM schedule requested by the NDEP when the annotated GW RAS outline was originally requested. The NDEP explained that having the precedents and interconnects are necessary to convey that the Companies understand the process and demonstrates their understanding to the NDEP. The NDEP noted that a good way to start building the schedule would be to take the informal schedule currently submitted by the Companies and work that into a Gantt/CPM schedule. The NDEP noted that a lot of detail more than three months out is unnecessary.

13. The Companies recited the steps they have taken to secure access to install up to three monitoring wells on the TRONOX property. The NDEP agreed to help acquire access permission. NDEP requested that the Companies annotate the steps taken to date and transmit to the NDEP (ACTION ITEM).