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Sent: Monday, July 17, 2023 9:21 AM

To: Taku Fuji <tfuji@anchorqea.com>

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Subject: RE: Gasco OU - Human Health COC and PRG Tables and RBDM/RBC Workbooks for Review

Taku,

DEQ has prepared this email in response to the Gasco OU Human Health COC and PRG tables that were transmitted to DEQ on March 10th and April 10th. Prior to receiving the Human Health COC and PRG tables, DEQ conditionally approved the Interim Feasibility Study (FS) pending resolution of our comments, some of which relate to development of PRGs for the Gasco OU FS. Shortly thereafter, DEQ transmitted the Contaminants of Concern, Risk-Based Criteria, and Preliminary Remediation Goals Memorandum (PRG memo), which included a recommended framework for assigning PRGs. In addition, DEQ conditionally approved the Remedial Investigation/Human Health and Ecological Risk Assessment Addendum for the Siltronic GSA (Draft RI/HERA Addendum) as revised, modified, or amended by DEQ's April 11, 2022 comments; NW Natural's RTCs and revised materials provided on July 8, 2022, September 13, 2022, and November 16, 2022; and DEQ's Replies to NW Natural's RTCs and revised materials provided with our conditional approval.

The conditional approvals of the Interim FS and Draft RI/HERA Addendum note NW Natural's intent to discuss certain topics related to PRG development with DEQ. NW Natural and DEQ met on February 8, 2023, to preview the information provided in the Human Health COC and PRG tables transmitted on March 10th. Based on the February 8, 2023 meeting, DEQ understands that NW Natural intended to assign Human Health PRGs consistent with the approach described in the PRG memo, except for revising PRGs for COCs that pose non-cancer risk to consider subchronic exposure and confirming the input parameters for calculating project-specific TPH PRGs. NW Natural and DEQ met on several occasions to discuss the project-specific TPH PRGs calculated for soil and groundwater. During a meeting on June 27, 2023, Anchor QEA proposed the following Human Health TPH PRGs:

- Soil PRGs for Occupational Worker Exposure Scenario: Use the values listed under the "Gasco Site-Specific TPH RBC (2021)" subheading on Table 10 (provided on March 10th).

- Groundwater PRGs for Occupational Worker Exposure Scenario: Use the values provided in DEQ's December 2021 PRG memorandum. Anchor QEA notes that a footnote explaining the basis for the DEQ calculated values will be added to tables presented in the Gasco OU FS.
- Soil and groundwater PRGs for Construction Worker and Excavation Worker Exposure Scenario: Use the values listed under the "Gasco Site-Specific TPH RBC (2021) Subchronic Toxicity Values" in Table 12 (provided on March 10th).
- Applying TPH PRGs for the Spent Oxide Area (RA-1) and the Former Tar Settling Pond Area (RA-3) to the Siltronic GSA consistent with the approach used in the RI/HERA Addendum.

At this point in time, DEQ understands that NW Natural has had the opportunity to raise questions or propose discussion topics germane to development of Human Health PRGs for the Gasco OU FS, including any items noted in the RTCs attached to our conditional approvals of the Interim FS and Draft RI/HERA Addendum, and that no additional discussion topics are necessary. We consider discussions regarding the approach to developing Human Health PRGs referenced in our conditional approvals of the Interim FS and Draft RI/HERA Addendum and the PRG memo to be complete. We do not require further discussion of Human Health PRGs. However, we require that NW Natural resolve the following comments on the proposed Human Health and PRG tables and proposed Human Health TPH PRGs in the Gasco OU FS.

1. The Human Health and PRG tables appear to identify COCs for the Gasco GSAs and the Siltronic GSA separately. For clarification, the Gasco OU FS must apply PRGs to all Gasco OU GSAs.
2. Specific Comment #75a on the Draft RI/HERA Addendum stated DEQ's intent to assign PRGs to any analyte identified as a COC, including those with the potential for cross-media impacts. DEQ notes that NW Natural's response to Specific Comment #75a noted that DEQ and NW Natural will have further technical discussions regarding cross-media COCs during assignment of PRGs. To-date, NW Natural has not proposed further discussion of this topic. All organic COCs that pose unacceptable risk based on any Human Health direct contact exposure scenario for surface soil, subsurface soil, or groundwater have the potential for cross-media impacts. DEQ requires NW Natural to assign surface soil, subsurface soil, and groundwater PRGs to all organic COCs that pose unacceptable Human Health direct contact risk for any media in any GSA, unless otherwise approved by the PRG memo (i.e., DEQ does not require a hydrogen cyanide-based PRG for soil direct contact scenarios).
3. DEQ acknowledges that the PRG Memorandum did not require development of a human health direct contact cyanide PRG. However, the PRG memorandum recognized that MGP residuals represent a long-term source of cyanide leaching to groundwater. NW Natural is responsible for demonstrating how cyanide leaching to groundwater from MGP residuals is addressed in the Gasco OU FS.
4. DEQ requires NW Natural to revise the PRG tables (e.g., Table 2, 4, 6) to include the RBC for each exposure scenario (e.g., including both occupational worker and construction worker RBCs for surface soil), and to select the lowest applicable RBC as the PRG. In addition, DEQ requires NW Natural to revise the PRG tables to include the applicable hot spot threshold value for each COC.
5. Additional COCs may be identified after completing the ongoing FS data gaps investigation. DEQ requires PRGs be developed for these COCs. DEQ's default RBCs shall be adopted as PRGs for these COCs.
6. DEQ requires that the Gasco OU FS include data summary tables that screen existing data against the applicable PRG, consistent with the tables presented in Interim FS Appendix J.
7. DEQ did not do a complete QA/QC of the tables used to identify COCs, but during our review of the tables we observed several errors. Revising the PRG tables consistent with the comments above should address these errors. Errors include, but are not limited to, the following:
 - a. Tables 1 and 2: Information provided in the Interim FS indicates that 2-methylnaphthalene is a human health COC for the occupational worker exposure scenario. The Gasco OU FS should adopt the Occupational Worker Soil 2-methylnaphthalene screening level value used in the Interim FS as the PRG.
 - b. Tables 1 through 4: Information provided in the Interim FS indicates that benzene is a human health COC for the construction worker exposure scenario. The Gasco OU FS should adopt the Construction Worker Soil benzene screening level value used in the Interim FS as the PRG.
 - c. DEQ notes that Tables 3 and 4 do not identify arsenic or lead as COCs for the Gasco GSAs. Information in the Interim FS shows exceedances of the Construction Worker PRG for arsenic and lead within one or more of the Gasco GSAs. Similarly lead exceeds the Excavation Worker PRG in at least one sample collected from the Gasco GSAs.
 - d. Tables 3 and 4: Information provided in the Interim FS indicates that naphthalene is a human health COCs for the excavation worker exposure scenario. The Gasco OU FS should adopt the Excavation Worker Soil naphthalene soil screening level value used in the Interim FS as the PRG.
8. DEQ accepts the Human Health TPH PRGs proposed during the June 27, 2023 meeting.

9. Table 9: DEQ understands that metals identified by blue shading were not detected at concentrations above background concentrations and will not be evaluated further in the Gasco OU FS. The intent of the green shading is unclear. We assume that metals identified by green shading will be evaluated further in the Gasco OU FS.

Please let me know if you would like to discuss further.

Thanks,

Wes

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Subject: Gasco OU - Human Health COC and PRG Tables and RBDM/RBC Workbooks for Review

Hello Wes,

Please find attached the tables (in PDF) and the RBDM/TPH RBC Excel workbooks that were presented and discussed with DEQ during the Human Health PRG Meeting held on February 8, 2023. These are provided for your review. As discussed with DEQ on February 8th, we are submitting these HH COC and PRG Tables and RBDM/TPH workbooks to DEQ in lieu of a formal PRG deliverable.

Attached for your review are the following tables and excel workbooks:

1. Tables 1 and 2 present the Human Health COCs and PRGs for surface soil.
2. Tables 3 and 4 present the Human Health COCs and PRGs for subsurface soil.
3. Tables 5 and 6 present the Human Health COCs and PRGs for Fill WBZ groundwater.
4. Tables 7 and 8 present the Human Health COCs and PRGs for Alluvium WBZ groundwater.
5. Table 9 presents the soil background evaluation for the Gasco GSAs, Siltronic GSA, and Doane Creek Area to identify metals that are at background levels and do not need further consideration in the Gasco OU FS.
6. Table 10 presents the site-specific TPH RBCs calculated in 2014 for the HERA, in 2018 for the Interim Feasibility Study (IFS), and in 2021 by DEQ as part of the PRG memorandum (December 16, 2021).
7. Tables 11 and 13 present some of the differences noted in the 2018 and 2021 TPH and RBDM workbooks for various parameters used to calculate the RBCs for DEQ review.
8. Table 12 presents the Construction and Excavation Worker chronic and subchronic Site-Specific TPH RBCs.
9. A "zip" file that contains the following DEQ RBDM and TPH RBC workbooks in four subfolders:
 - a. A blank copy of the 2018 RBDM workbook (2018 RBDM Folder).
 - b. A copy of the 2018 RBDM workbook used to calculate the subchronic RBCs/PRGs for thallium, carbazole, and dibenzofuran (2018 SubChron RBDM).
 - c. Copies of the five site-specific 2018 TPH RBC workbooks used to calculate the revised site-specific TPH RBCs for the IFS (2018 TPH RBC).

- d. Copies of the five site-specific DEQ TPH RBC workbooks provided to NW Natural in 2021 as part of the DEQ PRG memorandum (2021 TPH RBC).

We will be scheduling a technical meeting with Mike Poulsen to discuss the TPH RBC and RBDM workbooks and will follow-up in a separate email with some dates and times for this meeting.

At the February 8th meeting, DEQ requested that NW Natural provide proposals for how the site-specific TPH RBCs would be applied to surface/subsurface soil samples and Fill WBZ groundwater monitoring wells and how the Upper Alluvium WBZ groundwater would be evaluated in the Gasco OU FS as it relates to the potential occupational use of Lower and Deep Lower Alluvium WBZ groundwater. The proposal for the site-specific TPH RBCs is that they will be applied in the FS consistent with the methods used to apply the site-specific TPH RBCs in the HERA and HERA Addendum to soil and Fill WBZ groundwater. The proposal for the evaluation of the Upper Alluvium WBZ groundwater is that the portion of the plume within the Upper Alluvium WBZ that extends into the Lower Alluvium WBZ and Deep Lower Alluvium WBZ at concentrations greater than PRGs would be considered as part of FS cleanup evaluations of the Lower Alluvium WBZ and Deep Lower Alluvium WBZ. NW Natural will discuss these proposals in greater detail in upcoming PRG meetings with DEQ.

Thanks!

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