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November 5, 2019

Terry Campbell, PE
Environmental Engineer
WPCSRF
PO Box 200901
Helena, MT 59620-0901

RE: Seeley Lake Sewer District – Wastewater Phase 1 Collection System
SRF #C303187

Dear Mr. Campbell:

We are writing in response to your letter dated June 11, 2019 regarding the above-mentioned project. Below, you will find each of your comments followed by our response in italics.

General Comments:

1) Please include SRF Project Number C303187 on the plan cover sheet along with other funding agency project numbers.

The funding agency project numbers have been added to the plan cover sheet.

2) Ensure that the final plan and specification sets provided for DEQ approval are not only stamped, but also bear the signature of the project engineer and any specialty engineering professionals as appropriate.

The plans have been stamped and signed by licensed engineers.

3) Please ensure that 10-days prior to bid opening, there has not been an update modification to the Davis Bacon rates. If an update modification has occurred 10-days or longer before bid opening, include that modification via addendum or in the final specifications.

The Engineer responsible for bidding will review the Davis Bacon rates 10-days prior to bidding to ensure the most current rates are included in the project manual. If the rates need to be updated, an Addendum will be issued.

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9221 N. Division St.,
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Spokane, WA 99218
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4) Please remove Article 24 dealing with Debarment Certification from the Instruction to Bidders since Article 27 was added.

Article 24 has been deleted from the Instructions to Bidders.

5) On page 4 of 22 in the Supplementary Conditions, the highlighted text dealing with subsurface conditions appears to be from another project and needs to be corrected or removed if not applicable.

Page 4 of 22 in the Supplementary Conditions has been updated.

6) The planning process used by the District (culminating in the 2012 PER) ranked alternatives adequately to allow the District to meet "cost and effectiveness" criteria of our program. As a loan condition we need to have the District sign-off on the enclosed certification form indicating the project results in the most effective solution for the District.

See attached copy of the "Certification of EPA Cost and Effectiveness Requirement" for Phase 1 of the Collection System, signed by the District President.

7) Has the District developed and passed an ordinance to prohibit the connection of services with sump pumps or roof leaders from being connected? Also, has an ordinance requiring appropriate grease interceptors or other pre-treatment devices to be installed at restaurants or other businesses that generate fats oil or grease or other non-domestic wastes been adopted?

The District is anticipating passing the rules and regulations at the November 2019 Board meeting. Once these rules and regulations are adopted, the District will forward the final document to your office.. The rules and regulations prohibit the connection of services with sump pumps and roof leaders. The document also includes pretreatment and grease interceptors requirements. At this time, septic pumpers will not be allowed to dump at the plant or in the collection system.

8) Please address where future phases of the collection system will tie into this phase and address if the mains have been sized adequately for these future tie-ins. Also, given the range of flows from Phase I through Phase 4 collection system development, would dual force mains be more suitable? Has that alternative been considered?

Phase 2 of the collection system will most likely tie-in to the Phase 1 collection system at Manholes SS190, SS204, and SS165. Phase 3 will tie-in at Manhole SS204, and Phase 4 will tie in at Manhole SS190. These locations have been called out within the plans. As mentioned in Section 2.3 of the Technical Memorandum, the pipes designed to carry flow

from multiple phases have been designed to have sufficient capacity along their entire lengths.

Dual forcemains were considered, however it was determined that a single forcemain was more cost effective. Pump cycle times will be adjusted appropriately in each phase of construction.

9) Initially with the low flows that will be generated it seems likely the lift station and eventual treatment plant headworks will receive strongly septic waste streams. Is odor control something that should be installed and what impact is expected with respect to corrosion at these locations?

The forcemain alignment has been redesigned to include two lift stations. Both lift stations will contain aeration equipment, and both will be lined with T-Lock to provide corrosion protection. The influent manhole at the treatment plant will also be lined with T-Lock. Aeration of the lift stations should minimize the odors.

10) The Technical Memorandum (design report) states the force main under Morrell Creek would be directionally drilled to approximately 15 feet under the stream. The profile drawing of the stream crossing depicts the depth under Morrell Creek as a minimum of 8 feet. Please clarify which is correct. Per DEQ 2 Section 49.10. it seems appropriate to install clean-out ports at some interval along this more than mile long force main for periodic cleaning and maintenance? Please address. Also, please verify that the bending radius shown in the force main profile drawings prior to and at the Morrell Creek crossing can be achieved with the piping manufacturer.

The forcemain has been re-routed and will now cross Morrell Creek on Airport Road. The creek crossing is significantly smaller. Please see Sheet FM5.

See sheet FM9 for forcemain cleanout detail. There will be three (3) of these cleanouts installed along the forcemain alignment for cleaning; one between the two lift stations, and two between the Airport Road lift station and the WRRF. The locations of these cleanouts are shown on the plan sheets.

11) Because this is a new collection system, use of insulation to protect against frozen sewers does not seem appropriate for areas where additional bury depth could be achieved without resulting in excessive trench depths down gradient. Because the Technical Memorandum states the minimum depth of bury to protect against frost is 5 feet and DEQ 2, Appendix C requires 6 feet of frost protection for small diameter pressure pipe, we don't feel installation of insulation is an equivalent alternative when frost depth is not met. Although this is a common approach in renovating existing collection systems, it seems the better alternative is to make every effort to achieve the appropriate bury depth. Please justify this approach via

a deviation request if it will be maintained. We would want to have evidence the insulation specified maintains appropriate insulation value over the design life of the project. Also, please provide heat flow calculations to support the deviation request.

Sewer main depths have been adjusted where they can reasonably be lowered without causing downstream bury depths to become excessively deep. Effort has been made to maintain bury depths of at least 6.5 feet throughout the collection system, and all bury depths are deeper than 5 feet. Although it is mentioned in the TM that 5 feet of bury depth is appropriate for frost protection, we feel that it is good practice to provide insulation for any gravity sewer main with less than 6' of cover. As shown in the drawings, it has been specified that 6 inches of insulation be required everywhere that the sewer main has less than 6 feet of bury depth. At least 6 feet of bury depth has been accounted for on all small diameter pressure pipe.

12) While use of the low-pressure force main and the grinder pump configuration along US 93 between Cottonwood Lane and Redwood Lane seems appropriate to prevent excessive trenching depth, the addition of the small segment of low-pressure force main at the north end of Tamarack Lane does not. A gravity sewer collector could be installed along the entire Tamarack Lane alignment without having to dig to excessive trench depths. If this were converted to a gravity line for the entire Tamarack Lane alignment, could individual grinder pump stations be eliminated at the north end of Tamarack Lane? Refer to DEQ 2 Sections 33.2 & Appendix C.1. & C.24. Use of insulation to avoid excavations to below frost depth is not allowed in Appendix C without deviating from the standard.

If the proposed low-pressure force main at the north end of Tamarack drive was converted into a gravity main, the services on that stretch of pipe would still require grinder pump stations. The main cannot be dropped low enough to allow for conversion to gravity services while still avoiding excessive excavation depths at the downstream manholes, particularly Manhole #SS178. The low-pressure force main, can, however be buried slightly deeper to avoid the need for insulation along the entire Tamarack Drive Alignment. We feel that, since the grinder pumps are required for all these services, it is reasonable to avoid the costs of another manhole and 250' of 8" pipe rather than simply installing a cleanout and 250 feet of 1.5" low-pressure main.

13) The Technical Memorandum contains Figure 2-1 showing sewer service grinder pump locations, but those locations don't seem to correspond with the areas served by low pressure mains. Per DEQ 2 Section 20.13, the project plans do not currently contain a similar plan for grinder station locations. Please add this level of detail and define in an updated design report how the District will gain property access to install and maintain these grinder pump stations. Will easements be secured for each pump location? Who will have access to pump stations, who will perform inspection and maintenance and what legal instruments will be used to

define this configuration? Also address applicable portions of Appendix C.10 in developing this response.

Please see updated Figure 2-1, which shows the correct location of the grinder pump services within Phase 1. Grinder service locations have also been added to the site plan on sheet CS1 to satisfy DEQ 2 Section 20.13.

The District will own and operate the grinder pumps. The District is in the process of obtaining access easements from each property owner. A full O&M Manual will be developed and submitted to your Department prior to start-up of the system.

14) MPW manhole specifications indicate that manholes over 5 feet in depth will be paid for via a separate price per foot bid item. The bid proposal form does not include a bid item based from this provision. Please address.

Specification Section 00950, page 3, SM-00001 General deletes all of the MPW measurement and payment sections. It refers the Contractor to Specification Section 01275. Section 01275 requires payment for a manhole to include the full depth of the manhole as shown on the project plans.

<u>DEQ-2 Section Based Review Comments:</u>

15) 11.253.a. The design used a phosphorus contribution of 0.007 lbs/cap/day. Although this does not impact the collection system project, please be aware a deviation will need to be sought from DEQ 2 for using this lower number unless specific information is submitted to justify this lower number.

A deviation has been obtained. Please see attached.

16) 11.29.j. Because the WWTF will be a new system, the Department will require a "plan of operation" to be submitted with the treatment facility plans to ensure the District is taking appropriate actions early to ensure a smooth start-up and successful transition to operations and management. An outline of what is normally addressed in this plan of operation is enclosed.

The Seeley Lake Sewer District is currently working on a Plan of Operation. Once it is complete, the plan will be forwarded to your office.

17) 20.14 Include all appropriate design criteria on the plans near the beginning of the plan set.

All design criteria have been added to Sheet G2 of the Phase 1 Collection System plan set.

18) 20.211.a-c. & 38.2. Please enhance or replace the site plan for the work to depict all streams, wetlands and private wells adjacent or crossing the proposed sewer alignment. Wells, water works or treatment units within 100 feet of the sewer alignment must be shown on the plans.

All existing wells, hydrants, water mains, water services, streams, and wetlands are displayed and/or called out on the plan/profile sheets CS2-CS19 and FM2-FM8.

19) 20.22.b. Are all proposed sewers adequately deep to serve homes with basements? Have these individual sites been fully located and have service plans been adequately developed to ensure grinder station pumping can be minimized?

All sewer mains have been designed to meet the requirements of the existing homes utilizing as much gravity main as possible. If future homes have basements, they may need to install a grinder pump if gravity cannot be utilized.

20) 20.22.d. & C.11. Because this construction contract will be responsible to connect services, abandon septic tanks and make tie-in connections, please adequately detail and describe these work components within the bid package.

The Contractor will have access to all of the sanitary sewer surveys upon request. The survey results are over 500 pages total, and detail each service as well as the location of each septic tank. The Engineer will provide this information electronically to all bidders. Please see note in the Project Manual Table of Contents.

21) 20.32.d. & 33.3. & 33.83.e. & 42.24. Will any of the proposed sewer main alignment or lift station site be within seasonal high groundwater? Review of some of the well logs submitted with the Technical Memorandum reflect shallow groundwater (especially near the high school). Will trench dewatering be needed along the proposed alignment? If yes, has a buoyancy analysis been completed? Also, please address dewatering within the specifications as appropriate.

The sewer main alignments may be within the seasonal high groundwater. Please see the attached geotechnical report for the Phase 1 collections system project. Dewatering requirements are included in Specification Section 00910, SP-16.

22) 23. Provide lift station and force main design calculations and applicable pump curves used to size pumps and determine force main sizing. Sections 42.38. & 49.1. & 49.4. Based from attachment 2-1 in the Technical Memorandum, force main analysis appears to have been made for a 12-inch force main? Please provide lift station and force main calculations that support all phases of the project which results in flows and velocity sufficient to prevent build-up within the pipe. In the specifications for the lift station two different Flygt pump models are specified on pages 6 & 8 of spec section 02535. Please clarify.

Please see attached lift station and force main design calculations. The force main alignment has been redesigned to include two (2) lift stations (see plans). The lift stations have been designed to supply the 8" force main with enough flow and velocity to prevent solids build up. Please see updated Specifications Section 02535 for pump selection.

23) 25. An O&M manual will need to be provided for individual grinder stations and the main lift station prior to system start-up for Department review.

An O&M manual is included in the Engineer's scope and fee. The manual will be provided before startup for Department review.

24) 30.85.b & d. MPW Standard specifications cover deflection testing for plastic pipe, but do not address corrective measures when the deflection test fails. Will deflection testing be used and if so, please add a supplemental specification to define failure and corrective measures.

Please see Specification Section 00950 for testing requirements. If the pipe does not pass the defection test, it will have to be corrected. This correction may require the Contractor to remove and replace the mains that fail.

25) 34.1 Three of the gravity sewer main segments between manholes exceed 400 feet. Two of those are very close and probably fine. The third segment is 458 feet in length between manholes. Please document how these longer segments will be cleaned and support that the District will have the appropriate equipment and is willing to accept this longer length from an operations standpoint. A letter of support from the District will be needed for approval of these longer segments.

All of the gravity mains have been adjusted to meet the requirement of 400 feet between manholes to allow for ease of operation and maintenance and to meet DEQ requirements.

26) 36.21 For the directional drilling operation under Morrell Creek a casing pipe may be required. Please address.

Casing will only be utilized if jack and bore installation is used.

27) 41.4. and 42.231. & 42.75. What safety equipment for operator access/service work on lift station and grinder pump stations will be provided within the construction contract. If not provided via the contract how will appropriate equipment be secured and paid for? Please address portable ventilation equipment, oxygen sensors, tripod hoist and other equipment as appropriate.

The District will purchase safety equipment required for the lift station and grinder pump maintenance. These items have been included in the O&M cost estimates.

28) 42.35. & 44.31. Electrical drawings and specifications need to be added to the project as appropriate.

Electrical drawings and specifications will be added before bidding.

29) 42.4. The lift station plan and detail drawings only reflect the secondary level controls and no guide rails ladder or other appurtenances the may be needed. The lift station specifications address some of these issues, but the plan drawings should be enhanced for clarity.

The Lift Station wet wells will not have ladders, and the lift station sheets and specifications detail all necessary appurtenances.

30) 46.63. The lift station wet well floor must be sloped to the pump intakes.

A note has been added to the lift station detail sheets which instructs the Contractor to slope the wet well floor to the pump intakes.

31) 42.8. How will flow measurement to the eventual treatment facility be achieved? Should a totalizing flow meter be installed at the lift station within the scope of this work?

Flow through the treatment facility headworks will be achieved using a parshall flume after preliminary screening of influent. The lift stations will also be equipped with totalizing flow meters for flow monitoring.

32) 46. We could not find a specification section addressing lift station alarms and sequence of call out other than the Automatic Telephone Dialer. Also, the Auto Dialer section discusses coordination with UV and blower system? Please address.

These Specification sections have been updated.

33) 47.41. The back-up generator depicted on the plan sheets needs to be further addressed and specified.

Please see the electrical plans and specifications.

34) 49.3. Provide a detail for the low-pressure force main termination into manholes SS148 and SS207.

Please see sheet CS23 for low-pressure forcemain manhole terminations at these locations.

35) 49.8. & C.22. We did not see a specification for location tape to be installed along sewer alignments. This is especially critical along force mains. Please address.

Warning/location tape will be required along all new gravity sewer alignments, along with tracer wire and location tape on the force mains. Specification 02221 – Trench Excavation, page 4 of 17 specifies location tape. Specification 00910, SP-30, and Details 4/CS21 and 3/FM9 detail the tracer wire requirements.

36) Appendix C.13. & C.71. Provide calculations showing small diameter low pressure force mains will flow at a rate adequate to prevent build-up of solids (i.e. 2 fps).

Please see attached calculations and pump curves demonstrating that small diameter low-pressure forcemains will flow at greater than 2 fps in the worst-case scenario, with only the furthest most pump running.

37) C.21. Small diameter force main piping is not currently specified. Per this section it will need to be 200 psi rated pressure pipe. Please address.

A 1.5-inch SDR11 HDPE pipe has been specified on the plans for all small diameter forcemains, which is rated for 200 psi. Specification Section 02665 covers all sizes of HDPE piping.

38) C.73. Do specified grinder pump stations provide 24 hours of storage in pump tank? Please address.

Please see Specification Section 02536 and attached Grinder Pump Cut-Sheets and Deviation Request for storage/capacity requirements.

39) C.74. Inlet piping shown in grinder pump details does not submerge below low water level. Please address. A properly justified deviation would be required if this is not an option.

Please see Specification Section 02536 and attached Grinder Pump Cut-Sheets and Deviation Request for storage/capacity requirements.

40) C.75. Are dual check valves proposed to be used on all grinder pump services entering pressure pipe systems?

Check valves are included within all packaged grinder pumps, as well as on the curb stops for all pressure service lines, which will be installed at the property line of each grinder pump service. Please see details on sheet CS22.

41) C.77. A small diameter pressure line cleanout detail needs to be added in addition to the one contained in the plans for 4" and larger piping.

Detail has been adjusted on Sheet CS20 to show a small diameter pressure line cleanout. Please see sheet FM9 for large diameter pipe cleanout detail.

42) C.79 Specify leakage testing for small diameter piping.

Specifications Section 06665, Article 3.4 outlines the testing requirements for HDPE pipe ½-inch and larger.

43) C.9 & 34.8 Given the propensity for grinder station/low pressure piping areas to deliver waste streams that could be septic at the tie-in manholes, has corrosion protection and odor control at those tie-in locations been considered?

T-Lock liner will be required in all manholes where low pressure forcemain terminates.

44) C.10 Please address how grinder pump stations will be managed from an O&M perspective (i.e. access easements, ownership, service work, homeowner involvement, etc.)

The District will complete O&M of all grinder pumps. Please see rules and regulations when they are finalized..

45) Provide a detail for connection of small diameter piping into gravity manholes. They should produce laminar flow into the manhole bottom channel.

Please see sheet CS23 for low-pressure forcemain terminations into manholes.

Please contact me at 406-495-6160 or adeitchler@greatwesteng.com if you have any questions or need additional information.

Sincerely,

Great West Engineering, Inc.

Amy M Deitchler

Amy Deitchler, PE
Project Manager

cc: Felicity Derry, Seeley Lake Sewer District
Jean Curtis, Seeley Lake Sewer District
Karen Sanchez, Rural Development (email)
Jeanette Blize, MDOC (email)
Anna Miller, DNRC (email)

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November 1, 2019

Terry Campbell, PE
Environmental Engineer
WPCSRF
PO Box 200901
Helena, MT 59620-0901

RE: **Seeley Lake Sewer District – Wastewater Treatment Facility Phase I & II - SRF #C303187**

Dear Mr. Campbell:

We are writing in response to your letter dated June 11, 2019 regarding the above-mentioned project. Below, you will find each of your comments followed by our response in italics.

General Comments:

1) Please include SRF Project Number C303187 on the plan cover sheet along with other funding agency project numbers.

The funding agency project numbers have been added to the plan cover sheet.

2) Ensure that the final plan and specification sets provided for DEQ approval are not only stamped, but also bear the signature of the project engineer and any specialty engineering professionals (i.e. electrical, mechanical, etc ...) as appropriate.

The plans have been stamped and signed by licensed project engineers.

3) Please verify 10 days prior to bid opening, there has not been a modification to the Davis Bacon wage rates. If an update modification has occurred 10 days or longer before bid opening, include that modification via addendum or in the final specifications.

The Engineer will review the Davis Bacon rates 10 days prior to bidding to ensure the most current rates are included in the project manual.

4) The planning process used by the District (culminating in the 2012 PER) ranked alternatives adequately to allow the District to meet "cost and effectiveness" criteria of our program. As a loan condition we need to have the District sign-off on

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the enclosed certification form indicating the project results in the most effective solution for the District.

See attached copy of the "Certification of EPA Cost and Effectiveness Requirement" for the WRRF, signed by the District President.

5) As a point of record, the mechanical plan sheets contain many schedules and details that are not yet updated for this project. They will need to be updated prior to submittal of the final plan set. Also, there are import font issues within the electrical plan sheets that need to be corrected.

All Mechanical and Electrical sheets have been updated and these concerns have been addressed.

6) The Town of Manhattan initially purchased and began using sludge roll-off containers similar to what is being considered for Seeley Lake SD. They disliked and quickly abandoned those units. It may be worth a call to the Manhattan Public Works staff to determine why those did not work for them. I really don't know why they didn't like those units, but you could contact Jeff McAllister who is the public works director at (406) 284-2090 to follow up if interested.

The District singed an Engineering Amendment at the September 2019 meeting to change the design to indoor geotubes for sludge dewatering. Please see updated sheets P1-P5 in plan set.

7) 11.252., 122.1. & Appendix A. Has the District developed and passed an ordinance to prohibit the connection of services with sump pumps or roof leaders from being connected? Will an ordinance requiring appropriate grease interceptors or other pre-treatment devices to be installed at restaurants or other businesses that generate fats oil or grease or other non-domestic wastes been adopted? Also, will the District allow for septic pumpers to dump into the collection system or at the WWTF? If not, please adopt rules/ordinance to prohibit this. Otherwise address the load volume anticipated and design for the additional loading. Please provide copies of approved Rules/ordinances adopted by the District.

The District is anticipating passing the rules and regulations at the November 2019 Board meeting. Once these rules and regulations are adopted, the District will forward the final document to your office.. The rules and regulations prohibit the connection of services with sump pumps and roof leaders. The document also includes pretreatment and grease interceptors requirements. At this time, septic pumpers will not be allowed to dump at the plant or in the collection system.

8) 11.29.j. Because the WWTF will be a new system, the Department will require a "plan of operation" to be submitted with the treatment facility plans to ensure the District is taking appropriate actions early to ensure a smooth start-up and successful transition to operations and management. An outline of what is normally addressed in this plan of operation was previously provided. Please include budgeting detail showing anticipated operations and maintenance costs and how those will be supported financially. DEQ 2, Appendix E - Please consider the information contained in this appendix in addition to the previously provided outline in developing the "Plan of Operations" for the Seeley Lake WWTF.

The Seeley Lake Sewer District is currently working on a Plan of Operation. Once it is complete, the plan will be forwarded to your office.

9) 20.14 Some of the table contained on sheet G8 with design criteria is incomplete. Please fill in or eliminate as appropriate.

The Design Criteria on Sheet G8 has been completed.

10) 20.32.d. & 33.3. & 33.83.e. & 42.24. Will any of the proposed sewer main alignment be within seasonal high groundwater? Will trench dewatering be needed along the proposed alignment? If yes, has a buoyancy analysis been completed? Also, please address dewatering within the specifications as appropriate.

The sewer main alignments may be within the seasonal high groundwater. Please see the attached geotechnical report for the Phase 1 collections system project. Dewatering requirements are included in Specification Section 00910, SP-13.

11) 20.43.e. What is the plan for initiation of operation? Will seed sludge be used to speed start-up and minimize poorly treated effluent from reaching Rapid Infiltration RI cells?

The new WRRF will likely be seeded with sludge from Missoula's wastewater treatment plant at startup in order to minimize the amount of poor-quality effluent that reaches the rapid infiltration cells. The District and Engineer are currently discussing options with the City of Missoula.

12) 33.43. & 49.1. Please ensure the pumping rate from the primary lift station will at-all-times (especially at low flow start-up condition) be adequate to flush the force main with a flow velocity that is greater than 2 feet per second to prevent solids deposition. The Technical Memorandum indicates the VFD to be installed on the main lift station pumps "will allow the pumps to operate at a lower frequency, to reduce pumping rate when not necessary". (See page 4 in the TM).

The forcemain route has been changed, and a lift station has been added to the system. Pumps in both lift stations have been sized to handle peak hour flow at full buildout for the collection system. Variable Frequency Drives (VFD's) will be utilized on both lift stations to control the pump speeds, and they will be programmed to always pump at a rate that will not drop the pump below the scour level. The pumps will not drop more than 30% in speed in keeping with recommended VFD operating procedures. Therefore, the pumps will always pump at a flow rate that will maintain a minimum of 2 feet per second. The VFD's will be based on level controls, which can be adjusted as flows increase due to additional connections to the collection system. Please see attached hydraulic calculations for the lift stations.

13) 33.46. & 49.4. Are there segments of force main on steep slope conditions that need to be anchored or provided with surge protection? Please address and add appropriate detail if needed.

Due to the new forcemain design, there are no segments of the forcemain that will are on steep slopes to be included within the WRRF project. This will be addressed within the plan set for Phase 1 of the collection system.

14) 34.8, 49.3., 53.41., 53.5., 54.4. & 61.13. How will the manhole at the end of the force main, the headworks channels and screening equipment be protected against possible corrosion that may be caused by septic condition of waste stream? Initially with the low flows that will be generated at start-up it seems likely the lift station and eventual treatment plant headworks will receive strongly septic waste streams. Is odor control something that should be installed and what impact is expected with respect to corrosion at these locations? The headworks influent channel and screens may be subject to very corrosive conditions. Please address what will be done to reduce this potential issue. This could also pose a serious health and safety issue for operational staff. Is it necessary to cover the channels and install ventilation to carry H2S and other gasses out of the building? Should pre-aeration at the influent manhole or other corrosion protection be considered?

The forcemain has been redesigned to include two (2) separate lift stations, both of which will be aerated and lined with T-Lock liners to prevent damage caused by any septic condition within the waste stream. The influent manhole at the end of the forcemain will also be lined in order to protect against corrosion. The headworks room will be equipped with gas monitors and ventilation in order to control odors and protect operational staff.

The specifications and requirements for lift station lining and aeration will be included in the collection system project.

15) 42.8. How will effluent flow rates and volumes be measured and recorded? Please ensure pumping rates or other means of recording these flows are tied into the PLC or other recording device to allow operators to track and record this information.

The AquaSBR control panel that has been specified to meet all trending and monitoring requirements. Flowmeters will be installed at both lift stations and a parshall flume will be installed at the Headworks Building and after the UV system. The headworks and UV level sensor can be tied into the SBR plant SCADA system. Any approved equal control system will be required to meet this condition.

16) 42.9 & 56.24. Please describe how backflow protection requirements are being met with respect to the potable/non-potable water supply well. It is not a public water supply well, but for protection of the operations staff and public who use the potable services appropriate protection must be provided. The mechanical sheets contain some backflow details that are currently struck out in the plans. Please address as appropriate in accordance with ARM 17.38 Subchapter 3.

Backflow preventors will be required on each building throughout the process. These are detailed within the Mechanical sheets.

17) 44.4. Please clarify within the plans that all valve vaults and manholes will be adequately deep or otherwise protected against freezing. There is currently a manhole insulation detail on sheet C20, but no clear identification where that is to be used.

Plans have been updated to ensure that critical vaults and manholes have insulated lids as detailed on sheet C20. All vaults and manholes will be protected from freezing with adequate depth, insulation, or both.

18) 46. Please identify the equipment that will be supported from the emergency generator during a power failure. Plan sheet E8 identifies a 225 KW generator, but sheet E4 shows a 200 KW unit, please address. From the electrical load single line drawing it appears the generator to be specified will support all electric loads at the treatment facility? Will power failure result in a call out signal in the event the facility is unoccupied? Please describe the sequence of operation for this condition.

The critical process equipment at the WRRF will be supported by the backup generator. Headworks equipment, aeration, pumps, mixers, ventilation in classified spaces, PLC panels, and the drainfield control valves will all be supported by the generator. Some non-critical loads such as lights and door openers will also be supported. The generator needed for this load will be 225 kW. The transfer switch will automatically switch to

generator power, whether the plant is occupied or unoccupied. All critical process equipment will be brought online first followed by non-critical equipment.

19) 49.10., & 54.3. Pigging ports must be installed within the force main alignment. Please identify and detail where such cleaning access ports will be installed.

Cleanouts for pigging ports have been added to the plan set along the new forcemain route. There will be one cleanout between the two lift stations, and two between the Airport Road Lift Station and the WRRF site.

20) 52. & 122.22. Design criteria listed on sheet G7 use design BODs and TSS values for effluent that are BODs and TSS = 30 mg/L. DEQ 2 requires subsurface absorption cells receive effluent with turbidity less than 5 mg/L, BODs and TSS less than 10 mg/L and TN of less than 5 mg/L. While we agree with the determination on TN being allowed to not exceed 7 .5 mg/L based on the non-degradation analysis used in determining permit conditions, the BODS and TSS values of 10 mg/L and turbidity of less than 5 NTU must be used in design of the treatment facility.

Design Criteria table has been updated on sheet G7 and accounted for in the design.

21) 53.413., 65.1., 65.4. & 96.3. Please address the advantage of post equalization (EQ) vs having pre-EQ storage. While we understand the UV system can be downsized with use of post EQ, the advantages of having pre-EQ storage in this case seem to be significant especially with a 2-basin design that is not a flow-thru design. If pre-EQ is not proposed, how will the peak hour flow of 0.953 MGD at completion of Phase II be adequately treated?

Due to the nature of a true batch SBR system, and the volume available in each batch, there is inherent equalization to accommodate flow and organic spikes. Based on the designed cycle structure in Phase I and Phase II, the SBR system is designed such that one basin is always receiving flow. The SBR has a Phase II peak design flow of 0.616 MGD, which converts to 0.953 CFS, as shown in Table 1-3 of the Technical Memorandum. In the event of a peak hour flow reaching .616 MGD, the volume of water expected is approximately 428 gpm x 60 min = 25,667 gal; the volume available in each batch is over 43,000 gal. In addition, Aqua-Aerobic Systems control strategy modifies the cycles automatically depending on the exact water level at a given time. This allows the system to process peak hour flows even when the SBR receiving flow already had a partial batch. Any system proposed to be an equal during bidding will be required to provide the same treatment scenario during high flows.

22) 54.8. Please address any permits specific to the work that the contractor may need to secure, such as the stormwater permit, dewatering permit, any Army Corps permit or others. There is some standard language in the General Provisions but a Special Provision to further address the required environmental permits should be added.

Please see Specification Section 00910, Special Provision SP-17.

23) 55.3. & 96.18. Sheet P22 contains a sample tap detail that just needs further reference and callout within the plan sheets. Please identify all appropriate sample location for influent, effluent, sludge, return flows and any other appropriate places to ensure operators can easily grab samples for process control.

Sample taps have been called out on Sheet P1 on the sludge wasting line, and on Sheet P17 before and after the UV unit. Composite Samplers will also be placed in the Headworks channel and after the UV for sampling.

24) 57.l.i. Gas detectors must be installed within the headworks facility. Please address.

Gas detector has been added and called out on Sheet P1 in the plans.

25) 57. l.m. Please address what equipment the District will need for worker safety and confined space entry procedures and address if those will be provided by the contractor or the District.

The District will purchase the safety equipment required for the lift stations, grinder pumps, and WRRF maintenance. These items have been included in the O&M cost estimates and include blowers, tripod, harness, gas monitors. The District will include procedures for worker safety and confined spaced entry in the O&M manual.

26) 57.26. It appears a specification for chemical feed piping, fittings, valves and color coding or labeling of those systems will need to be added?

Chemical feed piping and fitting materials are addressed in Specifications Section 11245, and language has been added in Section 15060 to address labelling and color-coding of chemical feed piping. All valving is addressed in Section 15101.

27) 61.12. & 61.130. The bypass bar screen identified in the plans shows a 2" spacing between bars. We recommend a maximum spacing of 1-3/4" between bars, but encourage use of a 1" spacing if possible. Also, please specify a corrosion resistant bar screen material.

Manual bypass bar screen callout has been adjusted in the plans to show 1 inch spacing between bars, along with dimensions and angle of installation. Language has been added within the Special Provisions (SP-35) to specify corrosion resistant materials.

28) 61.122. Please provide a detail for the bypass bar screen that identifies the installation details, especially the slope condition and support structure.

Special Provision SP-35 has been added to specify the manual bar screen requirements. This specification was recently used for several other projects, which have been fully constructed and are operating without issue. Language on Sheet P1 has also been added to specify that the screen shall be supported within the headworks bypass channel per manufacturer's recommendations.

29) 61.128. Will the manhole in front of the headworks building and the influent pipe be protected against freezing?

Influent pipe and manhole insulation have been added and called out in the plans. Although the manhole will be shallow, the insulation will be sufficient to prevent freezing.

30) 61.15. Will non-potable hose bibs be installed within the screenings room and again in the sludge storage room to accommodate wash down?

Yes. Non-potable hose-reels have been called out in the dewatering room and in the main headworks rooms on sheet P1. Plumbing and routes for water service lines are called out in Mechanical Sheets. These hose bibs will be signed as non-potbale water.

31) 73.23. Sludge wasting piping from SBR's to Aerobic Sludge Holding Tank (ASHT) must be 4" diameter. This piping is currently shown as 3" diameter within the plans.

Sludge wasting pipes will be required to be 4" diameter between the SBR basins and the ASHT. New piping detail has been added to the plans on sheet P14.

32) Chapter 80. We agree the design for sludge handling is not a typical digestion process, so much of this section is not applicable. As described in the TM, the ASHT is not large enough at completion of Phase II to fully stabilize the solids transferred to the sludge dewatering containers. Therefor odors will likely build within the dewatering container. With respect to worker safety and explosion hazards, in addition to ventilation, odor control within the sludge dewatering container room must be provided. What is the percent solids goal prior to transfer to the landfill and how will that be ensured? Should a performance specification be added to the dewatering container/polymer feed equipment to ensure adequate performance?

The dewatering room will be considered an unclassified space . In order to be disposed of at the landfill, the sludge must pass the paint filter test. As mentioned in the Technical Memorandum, experience has shown that sludges dewatered to 20% solids or higher will typically pass this test. The geotubes should have no problem dewatering the sludge enough to be disposed of at the landfill. We will keep sludge in geotube until we get to 20% or more solids, which will pass the paint filter test at the landfill.

33) 87.1 I, 87.12. & 87.14. The sludge transfer pump from the ASHT must include redundant pumping capability (i.e. minimum of 2 pumps). Also, the table on plan sheet G8 needs to be completed with respect to this pump and other equipment.

A second pump has been added to the submersible pump assembly from the ASHT on Sheet P7. Sheet G8 and Specifications section 11000 have also been updated with respect to the ASHT sludge transfer pumps.

34) 87.2 I. Sludge piping from the ASHT to the dewatering vessel must be 6" diameter. This piping is currently shown as 3" diameter.

Sludge piping from the ASHT to dewatering building has been changed from 3" to 6" diameter on the plans.

35) 96.1. Since pre-selection/procurement of the SBR supplier was not performed in advance of design, it is distinctly possible the low bid will be based from an alternative supplier's SBR equipment. Section I .8 of specification section 11000 uses the term "or equal" to allow for alternative suppliers. We support and encourage this fair competition, but we have also seen when this can lead to significant re-design cost increases. We suggest this technical specification be modified to read "or approved equal" and possibly adding language to require the selected contractor to bear any costs associated with a project re-design and installation oversight if they base their bid from an alternate SBR system. It may be a good idea to also include this language in the "Instructions to Bidders" section of the bid specifications.

Specification Section 00700 and 00800, Section 7.04 outlines the requirements of submitting an "or-equal" product. However, we have added similar language to the "Instructions to Bidders" and technical Specification Section 11000.

36) 96.11.d. What is the source water (Seeley Lake water treatment plant) alkalinity? Is the alkalinity level sufficient to achieve the level of treatment needed, or will alkalinity need to be addressed?

According to the "Drinking Water Branch" website through mt.gov, the average alkalinity of the source water coming out of Seeley Lake's water treatment plant is 45 mg/L. This

average includes 17 samples, taken between January 9th, 2018 and June 18th, 2019. The samples ranged from 40 to 49 mg/L of total alkalinity during this time period.

In order to assure proper nitrification, sufficient alkalinity is required, as approximately 7.1 mg alkalinity (as CaCO3) is required for every mg of NH3-N nitrified. If the raw water alkalinity cannot support this consumption, while maintaining a residual concentration of 50 mg/l, supplemental alkalinity shall be provided. Based on this requirement, the wastewater should have at least 141 lbs. of alkalinity (as CaCO3). This can be achieved through a combination of influent (background) alkalinity and/or through chemical addition.

The alkalinity will be borderline so an alkalinity feed system has been added to the project to ensure treatment can be met all year.

37) 96.42. The F/M ratio of 0.044 lbs of BODs / lb MLSS-day used in design by AquaSBR is slightly below the range suggested in DEQ 2. Given the need to remove total nitrogen and not just BODs, please provide justification for use of this lower ratio.

The current design is based upon an F/M ratio of 0.038 lbs. BOD / lb. MLSS-Day in Phase 1, which corresponds to a MLSS of 3,500 mg/L at LWL as specified in Section 11000. From an operational standpoint, we do not have any concerns as the system will have sufficient biology to remove BOD and nitrogen based on experience. However, the MLSS can be adjusted in the field to target specific F/M ratios by adjusting water levels within the SBR.

Additionally, the plant will have a wide operational range to meet a F/M of 0.044 lbs of BOD/ lb MLSS. Wasting will be opitimized to meet the plant demand.

38) 96.5. Anticipating a phase III and IV, should the splitter box structure be constructed with stub-outs for those phases? Also, is the influent channel and screening equipment of sufficient size for these future phases?

Phase II of the WRRF is considered full buildout for the treatment facility, so the current design is sufficient to handle the flow from all four proposed collection system phases. All four of these phases will be added to the collection system, therefore stubouts in the splitter box structure are not necessary. All equipment in the headworks is appropriately sized to easily handle flows much higher than anticipated. If more treatment phases are proposed in the future, the Engineer will review the design of the headworks and splitter structure.

39) 96.52.a. Without pre-EQ, the SBR's must be designed for flow-thru operation for a 2-basin system, or a third basin must be included.

DEQ-2 Standard 96.52.a refers to systems where a basin is out of service. The SBR design does not require a basin be taken offline to perform maintenance. By providing retrievable fine bubble diffusers, retrievable submersible sludge transfer pumps, and floating mixers, all equipment can be maintained from the top of the SBR basin, thus eliminating the need to take a basin offline to dewater and perform maintenance. Any system proposed to be equal during bidding will be required to provide the same treatment scenario during high flows.

40) 96.6. The inlet to the SBR basins must enter above the high-water level.

As the influent lines are currently designed, the inlets will operate as a pressure system. The water in the flow splitter structure will always be at a level above the top of the pipe, so there will always be full-pipe flow at the inlet to the SBR basins. As a result, the first portion of requirement 96.6 does not apply because this is not acting as a gravity system.

The second concern within requirement 96.6 is backflow prevention on pressure lines. In the current design, there are three different methods of backflow prevention. First, the influent lines on each SBR basin will be equipped with an electrically operated plug valve to control the influent flow. Second, the splitter structure is equipped with multiple electrically actuated slide gates. Finally, the valves will be equipped with alarms to alert operators if there are problems with the operation sequence so that the valves can be manually overridden in the case of a malfunction.

As far as sequencing goes, backflow should never be possible because the splitter structure will not allow flow to more than one basin at a time. One basin should be filling while the other is batching, so the necessary valves will be open for the basin that is filling and closed for the basin that is batching. The valves for both basins should not all be open at the same time. The Glendive SBR system currently operates under a similar design, with the influent pipe at 8' below the high-water level, without issue.

41) 96.8. Two-basin SBR systems must be sized to treat 75% of the maximum month flow with one basin out-of-service and still meet the performance limits mentioned in comment #20. Please provide supporting calculations to show the design can achieve treatment at this capacity with one basin out of service.

Part 96.8 makes the provision to provide a decantable volume and decanter capacity to pass 75% of maximum daily flow with one SBR basin out of service and without changing cycle times.

As written, the suggested criteria makes no sense in reference to "without changing cycle times." Clearly, if one of the SBR reactors were taken off-line, to process flow through the

system, you would undoubtedly increase the cycle times. It seems their intent is to oversize the basins to the point where HRT can be maintained with a reactor off-line. However, in a flow through activated sludge system (92.321) all that is stated is that the aeration tank volume in an activated sludge process should be divided among 2 or more tanks. There are no considerations written in for aeration tank volume sizing to account for peak hydraulic flows, other than that the hydraulic properties of the system shall permit the design peak instantaneous flow to be carried with any single aeration tank unit out of service. So, in general, the approach as it pertains to general activated sludge treatment is to make sure peak flows can go through the system without the tank overflowing, and that's all. Shortened HRT, solids wash-out, etc. are apparently just fine in general activated sludge treatment with an aeration tank off-line, even though these parameters are even more sensitive in a flow-through system due to the recycle stream. When looking at the arbitrary oversized SBR design criteria suggested relative to the general activated sludge requirements, it hardly seems consistent with providing continuity and reliability of treatment equal to that of the continuous flow through modes of the activated sludge process shall be provided.

Oversizing of the reactors of this nature will create more concerns with system performance in the event organic loadings are ever significantly lower than design values (which is typical for many years of plant operation) than the "reliability" it is intended to provide at peak hydraulic flows with one basin out of service.

42) 96.10 l .g. Specification section 11000 specifies a 530 scfm/basin air delivery requirement, but Aqua Aerobics design summary in the Technical Memorandum supports 800 scfm/basin. Please clarify.

The Technical Memorandum was not updated based on new information. Specification section 11000, which uses a MLSS of 3,500 mg/L at the LWL, requires 530 SCFM/basin. This will be achieved by using two (2) blowers, each rated for 265 SCFM.

43) 96.12. Please address the reason for drain lines from the SBR tanks back to the manhole located after the headworks building and explain how that would be used? How will the sludge wasting line from the SBR basins enter into and terminate within the ASHT? Will the bottom of the SBR basins be sloped to a sump or other collection point for sludge removal? If not, how can basin washdown be performed in the future? How can sludge be moved between SBR basins for re-seeding a basin that was out-of-service?

The purpose of the drain lines is to provide a location for draining the SBR basins, if required. The 2 inch drains will be equipped with plug valves and low-pressure grinder pump service lines in order to pump waste back to the upstream manhole to be treated. The main SBR basins will each have a sump located in them but will not have sloped floors and will require some manual wash-down.

The sludge wasting lines from the SBR Basins will simply enter the ASHT through the basin wall with a penetration/wall sleeve and terminate after a manual check valve and a manual plug valve within the ASHT.
Operators will have to remove/transfer sludge by simply dropping a transfer pump into the desired basin and pumping the sludge over the top of the basin wall to the desired location. The main SBR basins are only 30 feet x 38 feet, so the relatively small volume should make this process simple.

44) 96.14. Please describe how the SBR basins (especially at low flow start-up conditions) will be protected against freezing and how treatment will be maintained in cold weather?

Based on previous cold weather experience, between the high biomass concentrations, relatively short cycles, constant influent introduction into the system, and the short non-mixing times, the system will have sufficient residual heat to avoid freezing issues. The Post-EQ basin will be covered to eliminate algae problems in the sunlight. In addition, the plant is anticipated to be seeded with biomass from the City of Missoula Plant so that treatment will be robust. The Glacier – Lake McDonald SBR system is very similar to this one, and currently operates uncovered in the winter without issue.

45) 96.16. How will scum and foaming be controlled/removed from the SBR and ASHT basins? What design features enable this?

The SBR is well equipped to avoid scum & other floating materials in the effluent. A floating decanter will be used, which is provided with a circular stainless-steel weir to minimize overflow velocities. This positively sealed effluent decanter system incorporates several mechanical design features and a mode of operation that results in optimum performance. Furthermore, this design assures that sub-surface withdrawal of supernatant will always be extracted from the reactor at an adequate depth, and within the diameter of the floating structure to avoid drawing surface material into the effluent flow. However, mechanical scum removal has been added via a 6" telescoping valve in each basin so the operator can easily hose the floating material towards the device.

46) 96.172.f. How will plant influent and effluent flow rates be visually displayed and recorded?

Plant influent flow will be measured through the Parshall Flume which can be incorporated into the SCADA system of the plant in order to trend and totalize the influent flow.

Please see the response to point 15), which will incorporate the UV flow signal to indicate the effluent flowrate.

47) 96.172.g. How does the proposed design accommodate peak hour or instantaneous flow conditions? What would happen to effluent quality as the plant approaches these loading conditions without having pre-equalization? Would that potentially impact groundwater permit compliance?

See answer to 21) on how the system would handle peak hour or instantaneous flow conditions. Based on the robust sizing of the SBR system, the plant will be able to handle the maximum flow conditions. In the event that the peak hour flows are sustained for long periods of times, and the cycles need to be significantly modified, effluent may be affected for that particular cycle. Monthly average requirements will still be met. Regarding higher loading to the system, based on the specification, the aeration system has been designed with a peaking factor of 2x to accommodate higher loadings. The permit compliance will be met underall peak hour or instantaneous flow conditions.

48) 96.172.g.&h. Please define alarm conditions contained within these two sections of DEQ 2 within a sequence of operations section in the specifications or other appropriate place.

The SBR control panel satisfies these requirements. Specific alarms will be addressed at the time of submittal. See Specification Section 11000, which includes these alarms.

49) Chapter 110. There is a detail on sheet C41 for a grinder pump station. Where will this be used on this project, or is this just a carry-over from the collection system project?

Multiple grinder pump units will be used throughout the site. One unit will be used for the sewer service from the office building to the headworks, and one unit will be used for each drain line coming out of the main SBR basins. This has been clarified on the plans.

50) 122.3. (9). What are the distances to the nearest downgradient well, stream, seep or wetland from the closest segment of the rapid infiltration system?

As mentioned in the Technical Memorandum (Section 8.3.2), the groundwater at the site flows towards the south. The nearest downgradient wells that could be found are located more than 2,700 feet downgradient from the proposed site. The nearest downgradient well is 3,200 feet from the rapid infiltration system.. Furthermore, Morrell Creek is over 2,900 feet to the west of the proposed site. Groundwater beneath the WRRF site is not hydrologically connected to any surface water, and no impact to any existing or anticipated uses of groundwater or surface water is expected.

51) 122.10. The design application rates for effluent at the subsurface absorption cells depicted in the Technical Memorandum seem well justified and do not pose a concern, but the design layout for the absorption cells varies significantly from the layout depicted and used in the Technical Memorandum. Does this additional

"stacking" of the absorption cells impact those TM calculations? Please address. Which layout was used in development of the discharge permit and would this variant impact the permit? For example, it appears from the earlier Permit work the phosphorus break through analysis predicted a minimum drainfield width of 700 feet, yet the design layout is 440 feet in length as shown on plan sheet C2.

The Phosphorous Breakthrough worksheet shown in the Technical Memorandum contains information based on preliminary design and worst-case scenario permit analysis. Please see the attached updated Phosphorous Breakthrough worksheet based on final design, which shows that phosphorous breakthrough will occur in nearly 87 years as opposed to the 50 years shown in the Technical Memorandum. The layout has not changed significantly, and the current layout of the drainfield does not impact the TM calculations as those were meant to show a very conservative, worst-case scenario for the sake of permit analysis.

52) 122.13. & 122.14. Please provide hydraulic calculations supporting the effluent can be uniformly distributed throughout the subsurface cells given the larger 3" discharge laterals? How were perforation intervals/sizing determined? Also, describe the sequence of distribution to ensure appropriate wetting/drying times. During winter operations, will soil freezing penetrate to a depth that would result in some field distribution areas with minimal cover freezing?

Please see attachment for a breakdown of the flows and pressures through each orifice throughout the entire drainfield, which shows uniform distribution of flow across all laterals. The absorption system is a pressure-dosed drain field using dosing pumps from the Post-EQ basin. The design incorporates the use of 36-inch wide gravelless infiltration chambers buried at least 12" below the finished ground elevation. Freezing is not expected to be a problem in a drainfield of this size and flow rate. The distribution laterals within the chambers will be spaced at 4.5' on-center, which is 1.5 times the design trench width, per DEQ-2.

The drainfield has a total of 12,000 feet of distribution laterals, which is divided into 6 individual zones at full build out. The maximum design flow for full-build out of the system is 347,000 gpd, and the design application rate is 10 gpd/sq. ft. This equates to 34,700 sq. ft of required application area. The design provides for 36,000 sq. ft of application area. The drainfield was conservatively sized based upon Phase 2 max daily flow, rather than Phase 2 average daily flow. It is important to note that only Zones 1-4 will be constructed during Phase 1 of construction, and Zones 5 and 6 will be constructed during Phase 2 (when Phases 3 and 4 of the collection system are constructed).

The effluent water will be pumped in a 6" diameter pipe from the Post-EQ basin, through the UV chamber, and into a junction box, which will contain 6 electrically actuated plug valves. The valves will be controlled by a PLC tied to the dosing pump. When the dosing pump is activated, one of the plug valves will open, and wastewater will flow to that zone.

During the next dosing cycle, the next programmed plug valve will open, and that zone will be dosed. This sequence will continuously cycle through all the zones to ensure that the entire drainfield gets the same amount of flow.

All pressure-distribution piping shall have a pressure rating of at least 160 psi. The design consists of 6" diameter HDPE discharge pipe (force main from Post EQ basin through junction box to distribution manifolds), and 3" diameter PVC lateral distribution pipes. The laterals will be 200-feet long with 5/32" diameter orifices spaced 5-feet apart. Provisions for thorough drainage of the laterals include downward facing orifices with orifice shields to achieve distribution and reduce scour of the trench bottom. We found that orifices with this size and spacing allow for the least amount of pressure drop across the laterals. The drainage capability of the laterals will help prevent freezing throughout the system.

Dose pumps in the Post-EQ basin are sized to achieve a minimum of nine feet of residual head across each zone in the infiltration system. Friction losses were calculated based on pipe length and a Hazen Williams "C" coefficient of 130. Minor losses include losses from discharge piping, pipe fittings, and valves. Based on system elevations and piping lengths, the worst-case zone was calculated. The hydraulics of this worst-case zone were then analyzed to determine the appropriate pump and pipe sizing. Based on our calculations, pumps capable of providing at least 370 gpm at 33 feet of total dynamic head will be adequate to dose the drainfield and maintain at least 9 feet of residual head throughout the system.

According to DEQ-2, Section 122.10, wet/dry ratios do not apply to subsurface absorption cell systems. The requirement for subsurface absorption cell systems is that "application rates must be designed to allow for complete drainage of the area between dosings." Therefore, specific wetting/drying times were not determined based on Table 122-2 in DEQ-2. For Phase 1 average daily flow, the dosing times will be about 4.2 hours per 24 hours, or about 10.5 minutes per hour. The dosing times for the Phase 2 average daily flow will be about 6.9 hours out of every 24-hour period, which could be broken down into about 17.3 minutes every hour. The potential flows for each phase are broken down below, but final dosing times will be optimized during the startup phase.

If Phase 1 is dosed at a rate of 10.5 minutes every hour, and the zone changes every hour, each zone will receive 6 cycles of flow per 24-hour period. This will result in 23,310 GPD per zone. Each zone can handle up to 60,000 GPD according to the conservative allowable loading rate (10 GPD/ft^2) used in the Technical Memorandum. Each zone can drain up to 2,520 gallons per hour (using 10 GPD/ft^2), and the maximum hourly dose for phase 2 will be 3,880 gallons. There will be a minimum of 3 hours between cycles for each zone, which indicates that each zone will have ample time to drain before the sequence comes back around to each respective zone.

Likewise, if Phase 2 is dosed at a rate of 17.3 minutes every hour, and the zone changes every hour, then each zone will receive 4 cycles of flow per 24-hour period. This will result

in 25,604 GPD per zone. Again, each zone is designed to be able to handle 60,000 GPD. Each zone can drain up to 2,520 gallons per hour (using 10 GPD/ft²), and the maximum hourly dose for phase 2 will be 6,400 gallons. There will be a minimum of 5 hours between cycles for each zone, which indicates that each zone will have ample time to drain before the sequence comes back around to each respective zone.

Flow distribution calculations yielded 1.73% flow variation across Lateral #1 in each zone (best case), and 3.34% flow variation across Lateral #5 in each zone (worst case). Hydraulic analysis results are attached. Provisions for field-testing to ensure even distribution are included in the plans and specifications.

53) 122.18. Please identify all locations where monitoring wells are required based on the groundwater permit.

All monitoring well locations near the plant site are shown on sheet C2 in the plans. There are three (3) existing monitoring wells within the site limits, and two (2) more will be installed by the contractor.

54) 122.19. A barbed wire fence is depicted around the entire WWTF site, but a chain link fence detail is shown on sheet C40. Please clarify within the plans.

Fencing callouts have been adjusted. There will be an electrified chain link fence around the entire border of the site to keep game animals and grizzly bears out. This is a requirement of the Rural Development Environmental Report.

55) 122.20. Please ensure all pumps, valves and other equipment are adequately deep, or insulated against freezing. The effluent structures may be more susceptible since water temperature will decline as it proceeds thru the plant.

Freezing has been considered at all points throughout the new WRRF. All equipment susceptible to freezing will be protected by adequate cover, insulation, or both. This includes all effluent pumps and valving. Portions of the effluent drain fields will be deeper than typical residential drain fields, and will be receiving much more flow than a residential drain field. Therefore, we do not believe that the effluent structures are susceptible to freezing.

Please contact me at 406-495-6160 or adeitchler@greatwesteng.com if you have any questions or need additional information.

Sincerely,

Great West Engineering, Inc.

Amy Deitchler

Amy Deitchler, PE
Project Manager

cc: Felicity Derry, Seeley Lake Sewer District
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