



April 11, 2007

Bridger Canyon Property Owners Association
16628 Bridger Canyon Road
Bozeman, MT 59715

ATTN: Deb Stratford, BCPOA Representative

**RE: Preliminary Review
Bridger Base Area Development
Gallatin County, MT**

Dear Ms. Stratford:

Allied Engineering Services, Inc. has been contracted by the Bridger Canyon Property Owners Association (BCPOA) to conduct a preliminary review of the proposed Bridger Base Area Development (Applicant), by Morrison-Maierle, Inc. (Engineer). Our scope-of-work includes a review and evaluation of the Ground Water Pollution Control System (GWPCS) Permit Application to the Montana Department of Environmental Quality (MDEQ). The intent is to provide a third party cursory review of the application with respect to state and local regulations, and any other issues regarding potential human and environmental health concerns.

Our review is based solely on information provided to Allied Engineering Services, Inc. by the BCPOA, which includes GWPCS Permit Application (dated: November 30, 2006) and related correspondence from MDEQ. Our review will address our initial concerns, but does not include a detailed review of the subdivision Planned Unit Development (P.U.D), water supply, wastewater treatment processes, groundwater or surface water issues, odor, etc.

Upon our initial review of the GWPCS Permit Application (dated: May 2006), it was evident that the Engineer and Applicant are still in the early stages of the review process. For example, it appears the Engineer has submitted partial information to the reviewing authorities, in hopes of obtaining concurrence before proceeding with the next step. Although MDEQ prefers a complete package of the Subdivision Application, some projects progress on a step-by-step basis. The engineer has submitted a Basis of Design Report for a Wastewater Treatment and Disposal System, sized to accommodate a design flow for the P.U.D. (145,000 gpd). The Basis of Design Report includes a description of the treatment system and processes, size, location, site conditions (test pits, percolation tests, groundwater, background nitrates, etc.), and a non-degradation analysis. The input parameters for the initial non-significance determination (dated: May 2006) was based on general information and was not site specific. MDEQ listed numerous deficiencies regarding the initial non-significance determination. The Engineer has since responded to MDEQ and conducted additional field work and calculations as part of the most recent GWPCS Permit Application (dated: November 30, 2006). Most of the input parameters for the non-degradation calculations appear to be site specific. However, since the development is located in an environmentally sensitive area (ie. Bridger Creek is listed as an "impaired stream"), we anticipate MDEQ could request a background nitrate sample collected from the upper 15-25 feet of the shallowest groundwater aquifer

within an immediate vicinity of the proposed drainfield area. According to the narrative by the Engineer, the existing background nitrate sample used in the calculation was obtained from an existing well servicing the Bridger Bowl Maintenance shop, located approximately 800 ft west of the proposed drainfield location. It appears this well was drilled 140 ft below ground surface, extending through the upper aquifer. However, the well was screened from 30-140 ft, which could include various water bearing zones, including the upper aquifer. At this time, it is impossible to say whether MDEQ will ultimately accept this data, or request additional monitoring.

The MDEQ indicated they cannot approve a general wastewater treatment report as submitted by the Engineer, without detailed plans and specifications for the entire system. This would include all water supply systems, wastewater systems, non-degradation requirements, a storm drainage, etc.

The Engineer has stated to MDEQ that the project is not fully defined, and the current application materials will be updated and additional information submitted as the project evolves. This includes the groundwater discharge permit application, detailed plans and specifications for the wastewater treatment system, water supply system, etc. It is difficult to determine the project status due to the unknown schedule and subsequent information. Many items still need to be addressed, including water supply, water rights, non-degradation, acceptance of the proposed wastewater treatment system, disposal of sludge, groundwater discharge permit, etc.

An additional issue that was discussed briefly in the application was the geologic conditions at the proposed location of the drainfield on the bench above Bridger Creek. The application submitted to MDEQ indicated this site is located on Cretaceous-aged bedrock overlain by Quaternary-aged alluvial deposits comprised of silt, sand, and gravel. The reference for their geologic interpretation was the "*Geologic Map of the Sedan Quadrangle, Gallatin and Park Counties, Montana*" prepared by Betty Skipp, D.R. Lageson, and W.J. McMannis in 1999. As a matter of reference, alluvial deposits are soil deposits that have been deposited by flowing streams/river or as outwash from past retreating glaciers. These deposits are generally fairly clean and contain high percentages of sand, gravel, and cobbles. The gravel and cobbles are normally rounded to sub-rounded due to the action of the water. Test pit logs indicated that a mixture of clay, sandy clay, and sandy clay loam with small percentages of gravel and cobbles were encountered in the test pits completed in the area of the drainfield. The descriptions were not detailed enough to determine if the deposits were alluvial in nature, although high percentages of clay normally are not indicative of alluvial deposits.

A second geologic interpretation of the Bridger Ski Area was prepared by John F. Whittingham in 1993 through Montana State University. This mapping included both the surficial and bedrock geology of the area. Their interpretation was that the surface geology in the vicinity of the proposed drainfield was a mass wasting area or debris area. Mass wasting areas are typically soils deposited by earth flows, debris flows, or landslides.

Our recommendation would be to provide a closer, detailed study of the bench upon which the proposed drainfield will be located to determine its geologic origin. If it is determined to be a mass wasting area, we recommend completion of a geotechnical analysis to determine the stability of the bench and drainfield area both under static and seismic conditions with the addition of wastewater.

Again, we are not suggesting this area is a mass wasting area or prone to any stability issues since we have not completed any work on the bench. Rather, we believe it would be prudent to take the study to the next step and complete a geologic study in order to resolve the conflicting geologic interpretations given the proximity of Bridger Creek to the toe of this bench. In this manner, the suitability of the drainfield area can be better determined.

In summary, we recognize this project could be a work-in-progress, which is common with many large scale projects. Although previously approved, older subdivisions, may not have received the much needed attention from the review agencies, please recognize that regulations have become more stringent throughout the years. With the ongoing development in Montana, and specifically Gallatin County, the reviewing agencies are now required to provide a comprehensive review of all aspects regarding sanitary facilities (water, wastewater, solid waste, and storm drainage). MDEQ will review the proposal in-hand, which could involve initial phases. Thus, they may not be familiar with the applicable zoning, or other aspects of the P.U.D. The MDEQ cannot issue an approval for any application until approval letters are provided from the local authority (ie. preliminary plat approval and conditions, comments from local sanitarian, etc.). Otherwise, the applicant would need to modify the application appropriately as part of the subdivision process.

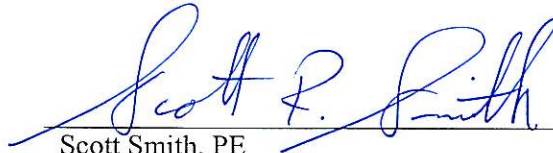
Please feel free to call if you have any comments or questions. Thank you.

Sincerely,

Allied Engineering Services, Inc.



Mark Fasting, PE
Civil Engineer



Scott Smith, PE
Principal Civil Engineer

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