Determining Nitrate and Phosphate Levels in Blacktail Creek

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Nitrates (NO3-) are nitrogen-oxygen chemical units which combine with various organic and inorganic compounds that are commonly used in fertilizers. Phosphates (PO43-) are inorganic chemicals that are important in biochemistry and ecology. In small quantities, both nitrates and phosphates are essential for the health of aquatic ecosystem. However, even a small increase in either nutrient can lead to an accelerated plant growth, algae blooms, low dissolved oxygen, and the death of certain fish, invertebrates, and other aquatic animals.

Blacktail Creek in Butte has previously had high levels on contaminants, including the nitrates and phosphates that were evaluated. Blacktail Creek is approximately nine miles long and empties into Silver Bow Creek west of Butte. The sampling plan included an approximately 1.5 mile reach along Blacktail Creek's most contaminated section, with eight sites being analyzed. During field sampling, grab samples and water flow data were taken to obtain concentrations and to calculate Total Maximum Daily Loads for the nutrients of interest. The data was compared to previous analyzed data, and similar conclusions were reached. The majority of the sites had elevated nitrate and phosphate loading, with the phosphates being the most highly elevated contaminant. The lower four sites on the sampling reach had the highest nutrient loading levels, and all four of these sites have the similarity in being located below the mouth of Grove Gulch that flows into Blacktail Creek. This finding supports the conclusion that the Grove Gulch inlet contributes a significant level of nutrient loading to Blacktail Creek.