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reported daily maximum for nitrates was 3.7 milligrams per liter (mg/l), or parts per million, and 4.6 mg/l for total inorganic nitrogen (TIN.) The permit limit is 23 mg/l for each. The reported 30-day average for ammonia was 0.4 mg/l and the daily maximum was 1.1 mg/l. There is no discharge limit for ammonia, a component of total inorganic nitrogen, because the Tri-Lakes plant has been proven to be so efficient in removing ammonia.

There is a new permit requirement to monitor ef u-



Terrific Buys! ent chloride monthly because new equipment that will be installed, using a \$1.08 million in state nutrient planning (\$80,000) and nutrient design/construction (\$1 million) grants, may use ferric chloride to chemically remove phosphates. The monitoring data will establish a baseline for chloride before this equipment is installed. The 30day average for chloride in May was 65.0 mg/l. Chloride levels were never required to be reported before the nutrient requirements were approved by the Water Quality Control Commission. The plant was not designed to remove phosphates or chlorides because there was never a requirement to treat for them until 2012.

Similarly, there is a new permit requirement to monitor sulfate monthly because alum (ammonium sulfate) is the other chemical that is normally used to remove phosphates. The monitoring data will also establish a baseline for sulfate. The 30-day average for sulfate in Tri-Lakes ef uent in May was 32.5 mg/l. Sulfate levels were never required to be reported before the nutrient requirements were approved by the Water Quality Control Commission in June 2012. The plant was not designed to remove sulfates because there was never a requirement to treat for them until now.

The 30-day average for copper in May was 6.5 micrograms per liter (μ g/l), or parts per billion. The temporary permit limit is 24.8 μ g/l. The daily maximum was 8 μ g/l;



the temporary permit limit is $36.4 \ \mu g/l$. The state Water Quality Control Division has not yet set a new permanent permit limit based on the EPA's national precedent-setting decision in June 2012 to accept the facility's research on biotic ligand model standard setting by GEI consulting. The study cost about \$500,000 to prove that the plant had never done any harm to aquatic life in Monument Creek, despite the previous claims by the EPA and the division. For further information, see the 43 citations that are available by searching the exact words "copper limit" at the top of the www.ocn.me home page.

Control Regulation 85 requires monthly sampling for nutrients in Monument Creek upstream (at Arnold Avenue) and downstream (at Baptist Road, below the mixing zone) of the Tri-Lakes facility, as well as for Tri-Lakes wastewater in uent and treated ef uent. The following data were reported for May.

In uent Total Phosphorus (TP): 6.6 mg/l Ef uent TP: 5.5 mg/l Upstream TP: 0.03 mg/l Downstream TP: 1.0 mg/l In uent nitrate: 29 mg/l Ef uent nitrate: 0.13 mg/l Upstream nitrate: 0.03 mg/l Downstream nitrate: 0.21 mg/l (shows that other nonpoint sources of nitrate entering Monument Creek are contributing substantially more nitrate than Tri-Lakes

ef uent) In uent nitrite: undetectable Ef uent nitrite: 0.08 mg/l Upstream nitrite: 0.00 mg/l Downstream nitrite: 0.00 mg/l In uent TIN: 29 mg/l Ef uent TIN: 3.88 mg/l Upstream TIN: 0.03 mg/l Downstream TIN: 0.21 mg/l In uent Total Kjeldahl Nitrogen (TKN): 29 mg/l Ef uent TKN: 3.88 mg/l Upstream TKN: 0.03 mg/l Downstream TKN: 0.61 mg/l In uent Total Nitrogen (TN): 38 mg/l Ef uent TN: 5.35 mg/l Upstream TN: 1.30 mg/l

Downstream TN: 1.08 mg/l Burks explained the activated sludge nitrification-denitrification treatment process to Smith and Strom, the new JUC members. During nitrification, bacteria oxidize the ammonia, converting it to nitrate, nitrite, and water. During subsequent denitrification, nitrogen is removed from the wastes and converted to nitrogen gas, which is released to the atmosphere (which is 78 percent nitrogen





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