#### State of Oregon

Department of Environmental Quality Memorandum

**Date:** April 4, 2011

**To:** Environmental Quality Commission

**From:** Dick Pedersen, Director

**Subject:** Agenda item E, Rule adoption: Amending water quality standards for arsenic

April 21-22, 2011, EQC meeting

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| **Why this is important** | This rule amendment revises Oregon’s water quality criteria for arsenic and adds an arsenic reduction policy. |
| **DEQ recommendation and EQC motion** | The Department of Environmental Quality recommends that the commission amend Oregon’s water quality standards for arsenic as presented in attachment A, including revisions to the numeric arsenic criteria and adoption of an arsenic reduction policy. DEQ also recommends that the amendments become applicable under state law after the criteria are approved by EPA and become effective under the federal Clean Water Act. |
| **Background and need for rulemaking** | The commission adopted the current arsenic criteria in the late 1980s when it adopted all of EPA’s 1986 recommended toxics criteria. In response to public comment in October 2008, EQC directed DEQ to review the science behind the human health criteria for naturally occurring metals. DEQ’s review, which is summarized in attachment E,led to this proposed rule amendment. DEQ also recommended revisions to the human health criteria for iron and manganese, which the EQC adopted in December 2010.  Oregon’s current human health criteria for arsenic are not attainable in many Oregon waters, due at least in part to natural sources. Trying to implement criteria that are below natural background levels can result in unreasonable costs to the state and regulated entities without yielding meaningful environmental results such as measurably reduced in-stream concentrations. The human health risks associated with natural arsenic concentrations are not new; they have been present since people have been drinking water and eating fish from Oregon streams, lakes and coastal waters.  Affected parties requested DEQ fast-track the arsenic, iron and manganese criteria rulemaking separate from the larger human health toxics and implementation tools rulemaking process. The commission adopted iron and manganese revisions in December 2010. DEQ delayed the arsenic rulemaking to allow time to receive additional public comment and to consider and respond to the comments. DEQ expects that several National Pollutant Discharge Elimination System permits due for renewal in the near future will need permit limits under the current criteria. As a result of the accelerated rulemaking, DEQ may be able to use the revised criteria to determine whether limits are necessary and to develop any subsequent limits. |
| **Effect of rule** | The rule amendment revises the numeric arsenic human health criteria as shown in the table below and adds a new arsenic reduction policy to the water quality standards rules. The changes are shown in attachment A as redline/strikeout changes to OAR 340-041-0033 and Table 20 for the arsenic criteria.   |  |  |  |  | | --- | --- | --- | --- | | **Human Health Criteria for Arsenic (µg/l)** | | | | |  | Water + Fish Ingestion | Fish Consumption Only - Freshwater | Fish Consumption Only - Saltwater | | Current criteria  (total arsenic) | 0.0022 | 0.0175 a | 0.0175a | | Criteria proposed Aug 2010  (inorganic arsenic) | 2.3 | 2.7a | 2.7a | | Recommended criteria  (inorganic arsenic) | 2.1 | 2.1 | 1.0 |   a The current and initially proposed fish consumption only criteria applied to all waters.  The arsenic reduction policy requires industrial sources that discharge arsenic and are within proximity to drinking water sources to develop arsenic reduction plans if they have the potential to impact the source water of a public drinking water supplier. The objective of the policy is to minimize human health risk associated with human sources of arsenic to the extent feasible where background arsenic concentrations are lower than the numeric criteria. The policy targets potential risks to drinking water supplies because the water and fish ingestion criterion is based on a 10-4 risk level, which is much greater than the risk level used for other human health criteria. |
| **Commission authority** | The commission has authority to take this action under ORS 468.020, 468B.010 and 468B.035. |
| **Stakeholder involvement** | During DEQ’s arsenic criteria review, DEQ informed and obtained input from the Toxics Standards Rulemaking Workgroup, a stakeholder committee that DEQ assembled to provide input on the toxics standards rulemaking. The membership of this group is provided in the issue paper in attachment E. DEQ discussed the issue paper findings and its recommendations with the rulemaking workgroup prior to the formal public comment period and the group supported DEQ’s recommendations at that time. |
| **Public comment** | DEQ accepted public comment from Aug. 25 to Sept. 30, 2010, and held public hearings in Portland and Pendleton. DEQ invited additional public comment on the proposed rule, including revised proposed numeric criteria, from Feb. 1 to 23, 2011. A summary and response to public comment is provided in attachment B; hearing reports are provided in attachment C. DEQ received comments from 28 individuals or organizations, which presented a variety of perspectives. Overall, commenters support adopting less stringent criteria together with an arsenic reduction policy. Commenters from areas of the state with background arsenic concentrations that are higher than the proposed criteria, however, expressed concerns that the criteria do not adequately account for the conditions of their waters. The issues are summarized in the following “Key issues” section and in further detail in attachment B. |
| **Key issues** | 1. *Meeting commission and agency goals*  An objective of DEQ’s water quality toxics standards work has been to meet the commission’s goals to protect public health, reduce toxic pollutants and achieve meaningful environmental results for the costs expended. Specifically in the development of the arsenic criteria, DEQ sought to ensure protection of public health and while recognizing the presence of naturally occurring arsenic in Oregon waters. The proposed rule amendments for arsenic are an incremental step toward meeting this goal.  2. *Creating criteria based on relevant and available science*  DEQ must ensure that Oregon’s water quality criteria are based on relevant and available science. The recommended arsenic criteria are based on EPA’s human health toxics criteria calculation method with several adjusted factors to make the criteria more appropriate for Oregon:   * The fish consumption rate based on 175 grams per day * The bioconcentration factor - a factor describing how much of a pollutant goes from the water column into fish tissue * An inorganic proportion factor - a factor describing how much of the arsenic accumulation in fish tissue is inorganic arsenic, arsenic’s most toxic form * The cancer risk level   DEQ used up-to-date data, information and studies to determine the values of the factors used. The arsenic issue paper provided as attachment E contains detailed discussion of DEQ’s evaluation of the scientific information and rationale used to derive the recommended criteria. Key aspects of DEQ’s approach are summarized below relative to the fish consumption rate and the bioconcentration factor.  The proposed arsenic criteria are based on a fish consumption rate of 175 grams per day. The current arsenic criteria are based on a rate of 6.5 grams per day. This increased consumption rate has been the subject of substantial review and public debate. EQC directed DEQ to use this rate as the basis for developing human health toxics criteria in October 2008. Using a rate of 175 grams per day protects the ability of Oregonians to consume fish and shellfish from Oregon’s waters on a regular basis without incurring unacceptable health risk.  The current arsenic criteria are based on a bioconcentration factor of 44. DEQ used a bioconcentration factor of one in its initial proposal based on an approach other states’ used to develop arsenic criteria. Based on public comment that additional data should be considered, including saltwater species, DEQ did further review of the available science and used additional bioconcentration factor data. After the additional review, DEQ developed proposed criteria based on a bioconcentration factor of 14 for the freshwater criteria and a bioconcentration factor of 26 for the saltwater criterion. Rather than having one set of criteria that apply to both fresh and salt waters, the proposed criteria reflect the significantly higher bioconcentration rates of marine mollusks. The saltwater criterion incorporates the high bioconcentration rates of mollusks because people do eat marine mollusks, such as oysters and clams, and the freshwater criteria are based on the bioconcentration rates of finfish. DEQ has no data indicating that people in Oregon eat mollusks from fresh water.  While DEQ evaluated all available BCF data, uncertainties remain, particularly for saltwater species. However, after reviewing natural ocean arsenic concentrations and conducting two calculations based on a range of BCFs pertinent for inorganic arsenic, DEQ concludes the recommended saltwater criterion is a reasonable and protective value.  3. *The cancer risk levels used to develop standards*  DEQ’s proposed arsenic criteria are based on higher cancer risk levels than DEQ generally uses for criteria or risk assessment. DEQ uses a risk level of 1×10-6 for all the other current and proposed water quality toxics criteria. DEQ proposes a 1×10-4 risk level for the water and fish ingestion criterion and a 1.1×10-5 risk level for the fish consumption only criteria. The proposed criteria represent an appropriate balance of human health protection and recognition that arsenic is present in Oregon waters from natural sources in the range of concentrations associated with these risk levels due to the state’s geology and soils. The human health risk associated with natural arsenic levels has been present since people have been drinking water and eating fish from Oregon streams. In addition, natural sources of arsenic cannot be practicably controlled. To list waters, including the ocean, as impaired and develop water quality improvement plans, known as TMDLs, in these circumstances is not a prudent use of public resources. According to EPA guidance, a higher risk level of up to 10-4 is acceptable when paired with a fish consumption rate that represents subsistence level consumption rather than the per capita consumption of the general population. Please see attachment E for additional discussion of the risk factors used.  4. *Communities with high background concentrations of arsenic*  The recommended freshwater criteria are 2.1micrograms per liter. While this is much less stringent than the current criteria, there are waters in the state with higher natural arsenic concentrations, particularly in areas of eastern and southern Oregon. Cities and residents in these areas have expressed concern that they will not be able to meet the new criteria and that the implementation tools that will be available to them will be costly to achieve and will amount to a “paper exercise” that results in no real water quality improvements. DEQ acknowledges the validity of these concerns and will work with these communities to identify appropriate solutions, whether that is to adopt site-specific water quality standards or use a permitting tool. In some cases, if arsenic levels are very high, drinking water supply may not be an appropriate use of the water body. In the meantime, it is a DEQ’s priority to move ahead with adoption of the revised statewide criteria.  5. *Adding an arsenic reduction policy to the standard*  DEQ recommends an arsenic reduction policy to minimize human health risk associated with human-caused sources of arsenic. Where water bodies in Oregon have background levels below the proposed criteria, members of the stakeholder workgroup suggested that arsenic additions from human activity be reduced where feasible in order to minimize human health risk. The arsenic reduction policy will require dischargers with the potential to affect a drinking water supply to develop an arsenic reduction plan and take feasible steps to reduce arsenic loading.  The reduction plan requirement applies to individual industrial NPDES permit holders because municipalities are subject to similar requirements under Senate Bill 737. The arsenic reduction policy includes a policy statement that nonpoint sources should also reduce inorganic arsenic pollution through erosion and runoff control. Additional discussion of the arsenic reduction policy is provided in the issue paper in attachment E. |
| **Next steps** | If adopted by the commission, the rule amendments will be filed with the Secretary of State and submitted to EPA for approval.  DEQ proposes that the criteria revisions and the arsenic reduction policy not be applicable under state law until the criteria are approved by EPA and effective under federal law. DEQ has included language in Table 20 and the arsenic reduction policy to this effect. Once EPA approves the criteria, DEQ will post an updated Table 20 on DEQ’s website where it is available to the public and affected permittees. In addition, standards program staff will notify all DEQ staff and managers that implement water quality standards of the rule change.  DEQ will develop internal guidance for permit writers to implement the arsenic reduction policy for industrial dischargers. Finally, DEQ will communicate the commission’s policy on arsenic reduction to other state agencies and federal land managers. |
| **Attachments** | A. Proposed rule revisions to OAR 340-041-0033  B. Proposed criteria revisions in Table 20  C. Summary of public comments and agency responses  D. Presiding Officer’s report on public hearings  E. Water Quality Standards Review and Recommendations: Arsenic  F. Statement of Need and Fiscal and Economic Impact and Addendum |
| **Available upon request** | 1. Relationship to Federal Requirements questions 2. Land Use Evaluation Statement 3. Legal notice of hearing 4. Cover memorandum from public notice 5. Written comment received 6. Rule implementation plan |

Approved:

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