



State of Oregon
Department of
Environmental
Quality



**Peer Review Comments on Proposed Short-term Guideline Concentration as
Received by Oregon Health Authority and Department of Environmental Quality**

William Lambert Comments

[Bill Lambert's comments and edits](#)

Proposed 24-Hour Screening Levels for Oregon Health Authority and Oregon Department of Environmental Quality

For Peer Review

October 3, 2016 (Updated October 12, 2016)

Background

The 24-hour screening levels [presented in this document](#) are intended to help state agencies determine whether measured ambient concentrations of air toxics pose an immediate health risk to people that requires ~~immediate-urgent~~ [action, such as emergency monitoring to confirm the discovered measurements, or cease-and-desist actions. As such, the recommended 24-hour screening levels should be considered to be action levels triggering action by public health agencies. The 24-hour screening levels should not be interpreted as thresholds where harm has occurred.](#)

~~Existing-Recently,~~ 24-hour screening levels were ~~initially~~ developed very quickly to guide decision making in the ~~immediate aftermath of the detection/discovery~~ of high concentrations of heavy metals ~~air samples around-obtained near~~ glass manufacturing facilities ~~in Portland~~. Subsequent review of these ~~screening~~ values concluded that some of the ~~screening~~ levels were derived from inappropriate source data, or were either overly conservative or not conservative enough. Therefore, OHA and DEQ have ~~jointly~~ undertaken a more deliberate and peer-~~reviewed~~ process to identify ~~scienceevidence~~-based screening levels.

The short-term screening levels ~~currently-being-reviewed-recommended in this document~~ are distinct from ~~Oregon's Ambient Benchmark Concentrations (ABCs)~~, which are designed to be protective of potential ~~chronic~~ effects from long-term air toxics exposures. Oregon's ABCs were developed by the ~~Air Toxics Science Advisory Committee (ATSAC)~~. While the ATSAC has previously considered the potential to derive short-term screening levels from ABCs, the committee ultimately concluded that this extrapolation is inappropriate since the relevant health endpoints for acute and chronic exposures are not always the same ~~and inherently differing mechanisms of pathogenesis are acting~~. Instead, the committee recommended that Oregon adopt short-term screening values from those previously identified by federal agencies and other states.

General Approach to Selection of 24-hour Screening Levels

OHA and DEQ toxicologists collaborated to compile existing federal and state human health ~~B~~ benchmarks for 24-hour averaging periods and the underlying justification behind each of them. ~~The 24-hour period was selected because this averaging time is congruent with conventional air monitoring practices.~~ Specifically we considered ~~existing~~ benchmarks, ~~guidelines, and action levels from federal and state agencies.~~ ~~from ATSDR MRLs, ERA IRIS, CA OEHHA, Minnesota, Michigan, Rhode Island, New York, Texas, New Jersey, and other states when available.~~ We summarized the critical studies used, the health endpoints evaluated, the species tested, the intended averaging time, and the uncertainty factors applied for each benchmark value. We ~~then~~ reviewed the available benchmarks and applied the following

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Commented [WL1]: The tense of this section shifts back and forth between past and future. I suggest you use the present and future tense. I tried to edit this section to help out.

Commented [WL2]: Sources other than these appear in your table – I would simplify the description to federal and state agencies.

guiding principles to select the most appropriate value as our proposed 24-hour screening level:

Overall principles used to guide selection of 24-hour screening levels

- ATSDR acute MRLs, ~~when available, will be given careful consideration~~ ~~were the first choice whenever available~~ because of their relevance of the averaging time, ~~the~~ route of exposure ~~in critical studies~~, and ~~the~~ population they are designed to protect.
- ~~We adopted~~ chronic values ~~will be used as they were~~ when ~~derived for~~ relevant ~~chronic~~ endpoints ~~that~~ have the potential to ~~be impacted over~~ occur with ~~repeated~~ short-term exposures (e.g. sensitive neurodevelopmental developmental processes, ~~lung fibrosis~~).
- ~~We only used~~ Only values derived ~~from for~~ non-cancer endpoints ~~will be used~~.
- ~~We avoided~~ short-term values that ~~were are~~ time adjusted from chronic values because the justification behind specific time adjustments is often obscure and the chronic endpoints are not always reflective of potential acute endpoints.
- ~~We avoided~~ values extrapolated from occupational exposure limits ~~should be avoided~~, but ~~did can be~~ used them when no other option ~~was is~~ viable (e.g., selenium).
- ~~We a~~ Avoided values derived from route-to-route extrapolation (e.g., California OEHHA's chronic REL for ~~S~~selenium ~~and extrapolation from ingestion to inhalation route of exposure~~).
- In order to make the derivation of 24-hr screening levels fully transparent, ~~we only use~~ selected values for which clear documentation is available.
- ~~We r~~ Rounded final values to avoid implying that screening levels reflect a greater degree of precision than they ~~really actually~~ do.

Commented [WL3]: I think you want to reserve the ability to evaluate an ATSDR MRL and apply it if it makes scientific sense – so I suggest this alternative wording. I agree with the approach to carefully consider an ATSDR MRL when one is available.

In the attached tables, we summarize the available benchmarks considered for each chemical. Some tables contain gaps in details for chronic benchmarks and occupational benchmarks that were deemed less relevant for our short-term screening levels early in the process. Below each table, we provide a rationale for our selected short-term screening level.

Specific Rationale for Proposed Lead and Total Chromium Screening Levels

For two chemicals (lead and total chromium) a slightly modified approach was required. For lead we simply propose adopting the federal National Ambient Air Quality Standard (NAAQS) as our short-term screening level. As a criteria pollutant, lead has a strong federal standard. It would be inappropriate to consider any short-term screening values for lead that are above this federal standard for chronic exposures. Furthermore, in the case of lead, a chronic exposure value is appropriate for a short-term screening value due to the sensitivity of the developing brain to lead exposure. For total chromium ~~approach~~ we propose to assume that 100% of the total chromium has the potential to be hexavalent. In any monitoring scenario where total chromium concentrations exceed this threshold, subsequent hexavalent chromium monitoring would be recommended to determine whether the hexavalent chromium screening level was being exceeded. While the total chromium screening level would inform prioritization of further monitoring, any emission control decisions would require direct monitoring of hexavalent chromium.

Commented [WL4]: This rationale is reasonable. The occupational standards set for adults are quite a bit higher than the NAAQS set for the protection of children.

Peer Review Process

We are now seeking comments from five external reviewers: Bruce Hope, Ph.D. Toxicologist – Member of Air Toxics Science Advisory Committee (ATSAC) and retired from DEQ and Ch2MHill

Commented [WL5]: This approach is quite practical and your rationale is clear.

Julie Wroble, Toxicologist, EPA Region 10

Michael Stewart, Ph.D. – EPA in RTP, NC

Fredrick Berman, Ph.D., DVM – Toxicologist, Oregon Health Sciences University

William Lambert, Ph.D. Epidemiologist, Oregon Health & Sciences University and Member of Air Toxics Science Advisory Committee (ATSAC)

Reviewers will submit their comments within 3 weeks (by October 25). Peer reviewer comments will be addressed, and the revised proposed 24-hour screening levels and rationale. Peer reviewer comments will also go out for public comment as we receive them.

In my review of the table, the screening levels for cobalt and manganese are set at the Oregon ABC (explicitly noted in the manganese comment field). This does not make technical sense to me and is a deviation from the guiding principles. Chronic processes of damage resulting from low-level exposures over a lifetime differ fundamentally from the damage from high exposure rates (acute exposures). I recommend that you consider a multiplier of the ABC (2x, 4x, 6x) in a 24-hour period that would trigger investigation action because if sustained would result in elevated long term exposure and chronic health effects.

Regardless, it will be challenging to communicate the rationale for your choice to the public, given the multitude of short-term exposure scenarios that they feel are relevant to their situation. For example, in SE Portland around Bullseye, elevated airborne levels probably exist for 24 to 72 hours as a particular furnace batch operation was active and then 4 weeks might pass before another batch is produced. Who does this intermittent exposure profile of peaks every 4 weeks year-in and year out relate to lifetime cancer risk? We are uncertain about this. However, what we can do is come up with reasonable 24-hour screening levels that if exceeded 1 time trigger an agency action to investigate sources and increase surveillance to establish the frequency of peaks.

For example, the way out of this conundrum is to set an action level mathematically related to each Oregon ABC. The trick is the choice of multiplier. For the sake of argument, let's go with 6-fold screening level. The ABC = 10 ug/m3. A "60" triggers an investigation response and additional air monitoring is conducted on a standard every 3-day schedule. Then over the next 90 days of special monitoring you observe no more peaks of this size again, but values near one-half the ABC. $(60 + (30d \times 5)) / 31$ days of monitoring = about 6.8 ug/m3, well below the ABC. Depending on the resources the DEQ and OHA can devote to this response, you might set the multiplier at 4 or 8. Of course this assumes the toxicologic damage from low-level constant exposure near the ABC is equivalent to one large bolus exposure in that time period, and we know this does not make biologic sense. But that does not matter! Our purpose to trigger agency investigation, not to quantify health effects in the population.

Bruce Hope Comments

Primary Comments

(1) It is suggested that you be very clear about how you intend to use these proposed screening levels. The cover document suggests that their exceedance is intended to signal an immediate and urgent threat. Is this true? If so, some clearer wording, like the following, is suggested: “The OHA intends to use these screening levels for direct comparison to ambient monitoring or modeling data collected and/or averaged over a 24-hour period. Exposure durations of less than 24 hours were not considered because ambient air monitoring conducted by Oregon DEQ rarely occurs over time periods shorter than 24 hours. Similarly, DEQ’s monitoring efforts rarely last long enough to obtain annual averages, and even if they were to do so, the OHA does not want to wait a year before making a statement about health risks. The OHA specifically intends to use these values as a guide when answering the question: *Does a 24-hour monitoring result indicate an immediate or urgent public health threat, one which requires a very timely response?*”

(2) You may also want to clarify, in addition to their averaging time, whether these screening levels would or could have a form other than “not to be exceeded” (i.e., action will be taken if just one sampling event exceeds a screening level). As is the case with several of the federal NAAQS, more than one exceedance could be needed, possibly spread-out over some time (e.g., “not to be exceeded more than once per year”). Adopting a one-shot “not to be exceeded” form is obviously the most conservative position but one that might lead to more conservatism than anticipated given that you have other conservative assumptions already included in some of the proposed screening levels (see Primary Comment #6 below).

(3) It is also suggested that you not call these particular screening levels “24 Hour Screening Concentrations” for three reasons: (1) the 24 hours refers to the duration of the sampling and/or modeling and not to some toxicological test necessarily conducted (or computed) over 24 hours, (2) the exposure durations encompassed by the proposed screening levels range from one hour (e.g., OEHHA acute REL) to over 8,760 hours (e.g., ATSDR acute MRL), and (3) some of the non-cancer ABCs (e.g., those derived from RfCs or chronic RELs) are also 24-hour values (based on how they’re calculated), which could be confusing unless you intend to use ABCs as actionable screening levels (but see Primary Comment #6 below). Referring to these particular screening levels as, for example, “acute exposure guidelines” or “acute exposure action levels” or something similar would avoid the 24 hour issue and better convey that they are to be used to indicate an urgent or immediate concern, possibly requiring some kind of timely action or response (if that is how you actually plan to use them – see Primary Comment #1 above).

(4) The phrase “*ATSDR acute MRLs were the first choice...*” suggests that there would be specific second, third, and so on choices – a hierarchy of choices. But this is apparently not the case since, failing your first choice, you fall back on a collection of guiding principles. Even recognizing that there is a public health preference for ATSDR values, it would be better to just state your principles – rather than a “first” choice - and then filter all of your potential options through those principles.

(5) “*Specifically we considered existing benchmarks from ATSDR MRLs, ERA IRIS, CA OEHHA, Minnesota, Michigan, Rhode Island, New York, Texas, New Jersey, and other states when available.*” But, per the tables, you also seem to have considered EPA’s AEGs (Acute Exposure Guideline Levels), NOAA’s ERPGs (Emergency Response Planning Guidelines), and Washington’s ASILs (Acceptable Source Impact Levels). You need to clearly identify all of the other guidelines or values you considered. And, between the AEGs and the ERPGs (and likely others), there is a considerable literature on the choosing and using values to indicate the need for a response action of some kind. Did any of that previous work inform your thinking behind the selection of these proposed screening levels?

(6) “*We adopted chronic values as they were when relevant chronic endpoints have the potential to be impacted over short-term exposures (e.g. sensitive neurodevelopmental developmental processes).*” In two instances (cobalt, manganese) you proposed a 24-hour screening level equal to an existing ABC. In a third instance (lead), you proposed its federal NAAQS as its 24-hour screening level, while DEQ’s ATSAC has (again) recommended using its

NAAQS as its ABC. In two other instances (beryllium, methyl ethyl ketone), you chose a chronic RfC, a type of value that has been used as an ABC in the past, as your screening level. And, in three cases (cobalt, lead, manganese), you have acute-chronic ratios of 1, indicating that you are positing no difference between what are demonstrably two different types of values. Although you've noted in the tables that "*OHA/DEQ staff are hesitant to adopt a 24-hour screening level that is lower than the annual ambient benchmark concentration,*" you seem willing to suggest 24-hour screening levels equal to annual ABCs or chronic values.

This distinction between at or below is irrelevant because any use of chronic values (ABCs or ABC-like chronic values) as screening levels intended to indicate an immediate or urgent public health threat (assuming that is truly what you mean – see Primary Comment #1 above) raises some significant scientific and policy concerns, namely:

- From a toxicological perspective, it is not at all clear whether there is any kind of dose-response relationship that would permit a short-term (24 hour or acute) exposure and a chronic exposure to yield the same response over the same time interval. So on what scientific basis can you set a screening level – one presumably indicative of an urgent or immediate concern - equal to a chronic value which requires a much longer exposure period to evidence a possible response? As it stands, OHA's proposed use of chronic values as indicative of urgency seems to be simply one of preference, without a demonstrably credible scientific basis.
- From a policy perspective, OHA and DEQ seem to be in conflict here. As a matter of DEQ policy, ABCs (mostly chronic values) have been evaluated on an annual average basis and not in relation to any single 24-hour exposure or monitoring event. The guiding rationale has been (correctly) that occasionally going above a chronic value (such as an ABC) is health protective as long as the annual average comes out at or below that chronic value. OHA's proposal to establish a single 24-hour exceedance of a chronic level (such as an ABC) as indicative of an urgent or immediate concern puts it in conflict with DEQ's long-standing ABC policy, its scientific rationale, and the 10+ years of public ATSAC meetings that stand behind it.
- From a practical perspective, using chronic values (which are low enough to be exceeded from time to time without leading to any actual adverse public health outcomes) to signal "urgent" concerns suggests that OHA could be frequently alerting the public to non-existent health threats. It is hard to see how the inevitable public turmoil and confusion arising from this is going to make OHA's (or DEQ's) mission any easier or more effective? Establishing chronic as urgent or immediate is more likely to simply complicate both agency's public outreach and communication efforts.

In short, it appears to be both questionable science and self-defeating policy to use ABCs or other chronic values as 24-hour or acute screening levels. Thus, it is strongly recommended that you not do so. If you persist in doing so, then it is suggested that you use them within a form that allows for some flexibility in exceedances over time, rather than one that is of an inflexible, once only, "not to be exceeded" variety. Ideally, DEQ and OHA should collectively address this issue and come to a result that does not flatly contradict the mission or policies of either agency.

Secondary Comments

(A) It would be potentially less confusing if the ABCs and the proposed screening levels were consistently shown in the same units, preferably micrograms per cubic meter. Otherwise a three decimal place error or misreading seems very likely to occur.

(B) The "Other sources checked" section for Hexavalent Chromium (on page 21) refers to naphthalene, not Cr (VI). On page 22, hexavalent chromium is referred to as "a metal" rather than (more accurately) as a compound.

(C) For selenium, you note that the proposed screening level "*...is more conservative than the OEHHA chronic MRL and ATSDR chronic MRL which required route-to-route extrapolation from oral human exposures.*" Whether a possible screening level is "more conservative" (however that's defined) or not is actually beside the point when it has already violated your "no oral extrapolation" guiding principle.

Air Toxic	Screening Level (ug/m3)	2010 ABC (ug/m3)	Acute/Chronic Ratio
Acetone	62,000	---	---
Arsenic	0.2	0.0002 c	1000
Beryllium	0.02 *	0.0004 c	50
Cadmium	0.03	0.0006 c	50
Cobalt	0.1 *	0.1	1
Chromium (hexavalent)	0.005	0.00008	62.5
Chromium (total)	0.035	---	---
Hydrogen sulfide	98	2	49
Lead	0.15 *	0.15	1
Manganese	0.09 *	0.09	1
Methyl ethyl ketone	5 *	---	---
Naphthalene	200	0.03 c	6667
Nickel (soluble)	0.2	0.05 (0.01 in 2015)	4 (20)
Selenium	2	---	---
Styrene	21,000	---	---

* Chronic values or same as existing ABC

Fred Berman Comments

Evaluation of OHA Acute Screening Level Decision Making

General

The method used to select appropriate 24-hr screening levels for a variety of chemical substances is based on assessments of existing federal and state human health benchmarks and the underlying justifications behind each. The available benchmarks were reviewed and a variety of criteria used in selecting the most appropriate values as proposed 24-hr screening levels. The selection criteria appear to me to be appropriate and rational. Moreover, the modified criteria that were submitted in regard to chromium compounds, which takes into account the difference in toxicity among its various forms, appears to be a better method for determining the acute hazards on a case-by-case basis.

I do have general concerns, which are mostly along the lines of those voiced by Bruce Hope, primarily as regards to how these screening levels will be used. Rather than reiterating, I will instead defer to his thorough assessment on those concerns.

Acetone (62,000 ug/m3)

This concentration would be protective on an acute exposure basis. Acetone occurs naturally in the metabolism of fats; therefore, our bodies are able to process this ketone effectively. The level cited is also at the lower end of the odor threshold, so should not be controversial to the public on a nuisance odor basis.

Arsenic (200 ng/m3)

Based on reproductive studies in animals, which should be protective of the primary pulmonary effects, which occur at much higher concentrations.

Beryllium (20 ng/m3)

The rationale seems solid with regard to the very serious consequences of sensitization and pulmonary pathology caused by this metal.

Cadmium (30 ng/m3)

No comments.

Cobalt (100 ng/m3)

Based on the data available, it appears that it would be difficult to pin down a well-derived acute exposure concentration. However, the value selected would most likely be protective of the population, inasmuch as it is the same as the ABC.

Hexavalent chromium (5 ng/m3)

No comments

Chromium compounds (5 ng/m3)

I'm assuming that, based on the modified documentation, the total chromium screening level is now the same as the hexavalent chromium value. The difference being, that if this level is exceeded, then further speciation will be conducted to see if the hexavalent chromium concentration has been exceeded. This modified procedure would be protective if the various forms of chromium were constant in proportion over time for any given source. I don't have the knowledge as to whether this would be a concern.

Hydrogen sulfide (98 ug/m3)

This level is above the odor threshold, which could be a problem in terms of sensitive populations who may suffer psychosomatic effects. I would almost prefer the lower value used by agencies that considered mean odor threshold as the point of departure. Not sure how this would affect paper mill operations if a lower screening level were used. Nevertheless, the value selected should be protective.

Lead (150 ng/m3)

No comments.

Manganese (90 ng/m3)

No comments.

Methyl ethyl ketone (5000 ug/m3)

No comments.

Naphthalene (200 ug/m3)

This should be protective of the most sensitive populations. I believe this is below odor thresholds, so also accounts for odor complaints and psychosomatic issues.

Nickel (200 ng/m3)

Hopefully, this should be protective of those with allergies to nickel compounds.

Selenium (2 ug/m3)

Not a lot of data to go on. This concentration seems appropriate.

Styrene (21,300 ug/m3)

No comment. Should not pose problems re complaints based on odor detection.

Julie Wroble Comments (The views expressed by Julie Wroble in her comments are hers, and do not represent the official views or policies of the U.S. EPA.)

Comments from Julie Wroble regarding: Proposed 24-hour Screening Levels for Oregon Health Authority and Oregon Department of Environmental Quality.

Disclaimer: The views expressed in this document are those of the author, and do not represent the official views or policies of the U.S. EPA.

David:

Thank you for the opportunity to provide some comments on the proposed 24-hour screening levels you have compiled. I have not been able to complete an exhaustive and thorough review of the values, but I am able to provide some input for your consideration. Please contact me if you have questions or concerns about these comments.

In the background section of your memo, you may want to explain the extent of the peer-review or indicate that it was a limited peer review. I did not independently check the source of each of the values or look for alternative values except in a few cases. I did compare to EPA's Acute Exposure Guideline Levels (AEGs) where available. I didn't identify any AEGs that were more conservative (i.e., lower) than selected values.

In the overall principles section of the memo, you may want to explain why cancer endpoints weren't considered; cancer usually develops after repeated exposures over a longer exposure period so short-term exposures to occasionally high concentrations of carcinogens wouldn't be expected to result in cancer.

Consider softening or clarifying the language about short-term observed concentrations of lead above the NAAQS. While the endpoint of neurological development is very important, the standard is implemented as a rolling average, so an occasional exceedance is tolerable provided that the rolling average stays below 150 ng/m³.

For chromium, I agree with the state's choice to use the short-term value for hexavalent chromium for total chromium as an initial screen. Additional data collection efforts focused on hexavalent chromium could proceed if exceedances are noted.

The exposure duration for the arsenic value is 4 hours/day during a critical window of development. Should we be concerned about exposures at this level for 24 hours? Should an extra safety factor be added to the value or do the current uncertainty factors account for this?

Cobalt has a provisional subchronic RfC from EPA's PPRTV. This value was derived from the same study as the ATSDR chronic MRL, allows for continuous exposure and has an added safety factor. ATSDR's MRL is intended for chronic exposure. Additional justification may be needed for selection of the ATSDR value as compared to EPA's PPRTV.

MEK should be 5,000,000 ng/m³ based on units provided in the detailed tables.

Is there a need to find a value protective of acute poisoning of neonates (hemolytic anemia) as referred to in EPA's IRIS profile for naphthalene (Section 4.7.1)? The NTP study is more recent than the one on which the 24-hour recommended value is based, but may not address short-term effects.

Michael Stewart Comments (The views expressed by Julie Wroble in her comments are hers, and do not represent the official views or policies of the U.S. EPA.)

Comments from Dr. Michael Stewart regarding: Proposed 24-hour Screening Levels for Oregon Health Authority and Oregon Department of Environmental Quality.

Disclaimer: The views expressed in this document are those of the author, and do not represent the official views or policies of the U.S. EPA.

General comments:

- In the background section, it is stated that 24-hour screening levels “will help state agencies determined whether measured ambient concentrations of air toxics pose an immediate health risk to people that requires immediate action.” While I generally support the use of 24-hour screening levels by Oregon state agencies to help identify potential air toxic concentrations that may be of health concern, I do not believe that the sources of screening levels identified by OHA represent values that can be used as bright lines to represent an “immediate health risk.” For example, when available, I generally support the use of acute Agency for Toxic Substances and Disease Registry (ATSDR) minimal risk levels (MRLs) as 24-hour health screening values, but by ATSDR’s own definition, exceeding these levels does not imply an immediate health risk. ATSDR cautions: “**It is important to note that MRLs are not intended to define clean up or action levels for ATSDR or other Agencies** (see <http://www.atsdr.cdc.gov/mrls/index.asp>).” Thus, I believe exceedances of ATSDR MRLs, as well as the other 24-hour screening values proposed by OHA should be used to identify areas of interest where further investigation is needed.
- The limitations and uncertainties associated with the proposed 24-hour screening values should be adequately discussed by OHA. Reviewing the documentation provided, there is currently no discussion of limitations or uncertainties associated with any of the 24-hour screening levels. Limitations and uncertainties associated with these values will be particularly important to consider as risk management decisions are being made.
- The overall approach outlined for the selection of 24-hour screening values is for the most part, a reasonable means for Oregon OHA to select screening values. As noted above, I support OHA’s preference for ATSDR acute MRLs when these values are available. That being said, I have a number of reservations about using longer-term health values (e.g., the lead NAAQS) as 24-hour screening levels (see below comments on specific proposed values).

Comments on specific proposed values:

- Using the level of the National Ambient Air Quality Standard (NAAQS) for lead as a 24-hour screening value is problematic. In setting the NAAQS for lead, EPA considered the available health and risk information, including developmental effects in sensitive populations, and set the NAAQS as a 3-month rolling average not to exceed 150 ng/m³. It should therefore be expected that on a 24-hour basis, some facilities will emit lead concentrations that exceed 150 ng/m³ (because even if these facilities do so, they can still ultimately be in compliance with the

lead NAAQS). If OHA decides to use the level of the lead NAAQS as its 24-hour screening level, it should only be used to indicate that longer duration lead monitoring may be warranted.

- With respect to hexavalent chrome, OHA is proposing to use the chromic acid ATSDR intermediate (15 to 365 day) MRL as the 24-hour health screening value. Notably, the chromic acid MRL is approximately 60 times more conservative (MRL = 5 ng/m³) than the ATSDR acute MRL for particulate hexavalent chrome (300 ng/m³). OHA is proposing to use the more conservative MRL because DEQ's monitoring equipment can not differentiate between chromic acid and particulate hexavalent chrome. In situations where OHA needs to monitor for hexavalent chrome, to the extent it is possible, I recommend seeking information about potential sources of chromium influencing the monitor and then determining which of these two ATSDR intermediate MRLs is most appropriate to use as a screening value. It very well may be that certain industries and their associated processes are much more likely to emit a certain type of hexavalent chrome. Once the appropriate value is selected, I would then recommend additional monitoring given that an intermediate (15 day to 364 day) MRL is being used.
- Comparing total chromium to the hexavalent chrome ATSDR intermediate MRL as a means of determining whether specific monitoring for hexavalent chrome is needed is a reasonable approach for OHA and Oregon DEQ.
- With respect to manganese, OHA is proposing to use the Cal EPA chronic REL (90 ng/m³) as a 24-hour screening level. Similar to lead, I think using a long-term, in this case a chronic, health benchmark as a 24-hour screening level is problematic. Taking into account all of the health information available, this level is defined by California as being a chronic REL, so on a 24-hour basis, we should expect that this level will be exceeded from time to time. In addition, I would like to see more of an explanation as to why OHA prefers the more conservative chronic Cal EPA REL as opposed to, for example, the more recently reviewed ATSDR chronic MRL (300 ng/m³). The rationale section for manganese states that "almost all guidelines are derived from the same long-term occupational study" and that Cal EPA uses the "the most conservative approach" for interpreting this data. I think more of an explanation is needed as to why the most conservative approach for developing a chronic reference value represent the most appropriate choice for a *24-hour screening level*. Again however, I would only use a 24-hour exceedance of the chronic Cal EPA REL (or the ATSDR MRL) as an indication that longer-term monitoring may be needed. Short-term excursions above these benchmarks would not represent an immediate health risk that requires immediate action.
- With respect to cobalt, if OHA uses the chronic ATSDR MRL as the 24-hour screening level, I would only use the exceedance of the MRL as an indication that longer-term monitoring may be needed. As previously noted with respect to manganese, short-term excursions above the ATSDR chronic MRL are expected, and would not represent an immediate health risk that requires immediate action.