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HUNDRED-AND-SEVENTY FIFTH MEETING OF THE SCIENCE ADVISORY BOARD (NCSAB) ON TOXIC AIR POLLUTANTS

Proceedings of the May 28, 2014 Teleconference

Dr. Starr called the meeting to order at 2:10 PM. NCSAB members Drs. Thomas Starr, Ivan Rusyn, Woodall Stopford, David Dorman, and Elaina Kenyon were in attendance. Dr. Rick Langley, North Carolina Division of Occupational and Environmental Epidemiology, Maria Hegstad, Inside EPA, Director Shelia Holman, Joelle Bureson, Nancy Jones and Dr. Candace Prusiewicz, DAQ, were also in attendance.

Approval of January 2014 Minutes

Dr. Starr indicated that he had a few minor editorial changes (typos and wording) to the minutes. He will submit them electronically to Dr. Prusiewicz for inclusion in the final minutes. Meeting minutes from the 174th meeting held on January 29, 2014 were unanimously approved as amended.

Meeting minutes that have been approved by the NCSAB are posted on the Division of Air Quality website at http://daq.state.nc.us/toxics/risk/sab/sab_minutes.shtml.

Cadmium AAL Vote

Dr. Starr requested the board repeat the vote on the recommendation for a revised cadmium AAL. The board had unanimously approved a new recommended AAL value through an email vote; however although not the intent, such a vote could be interpreted as non-transparent and not open to the public.

Dr. Stopford noted that the recommended AAL value is 10-fold less than the current AA and is below the quantitation level of routine EPA analytical methods. He inquired if the recommended AAL value would only be useful for modeling purposes and if anyone had substituted the proposed value into a model to estimate fence-line concentrations. He wondered if an emission limit could be set for such a low concentration. Dr. Prusiewicz indicated that, other than the public comment period, the proposed AAL value had not been widely shared outside the board meetings. Dr. Starr confirmed that air dispersion modeling software could deal with the low value and that an emission level associated with the AAL value could be determined. Dr. Starr pointed out that the 10-fold change in the recommended AAL value was not due to a change in potency, but rather a change in the risk criterion used; specifically from 10^{-5} to 10^{-6} . At the time the original AAL was established, cadmium was considered a possible human carcinogen so a criterion risk level of 10^{-5} was used. Cadmium is now considered to be a known human carcinogen and so the appropriate risk level to use is 10^{-6} . While the board relied on an updated re-analysis of the epidemiological study originally used to establish the cadmium AAL, the potency factor did not significantly change. Dr. Starr noted that it was problematic for him that the board was recommending an AAL value that was not measurable using the standard analytical EPA method. He pointed out, however, that the original AAL value was also not measurable with the current analytical method.

Dr. Stopford made a motion to approve the recommended cadmium AAL. Dr. Rusyn seconded the motion. Dr. Starr asked if there was any discussion. Dr. Rusyn asked whether any comments were received on the document while it was out for public comment. Dr. Prusiewicz replied that one minor editorial comment was received from Dr. Reginald Jordan, the previous DAQ SAB liaison. The board then unanimously approved the recommendation for a revised cadmium AAL of 5.5×10^{-7} mg/m³.

Evaluation of AALs for Unique North Carolina Air Pollutants

Dr. Starr requested that the DAQ describe the directive that had been emailed to board members regarding evaluation of unique North Carolina pollutants (Attachment 1). Director Holman shared that the DAQ is required to complete two items under recent North Carolina legislation. Under House Bill 74, also referred to as The Regulatory Reform Act of 2013, the DAQ is required to categorize 367 North Carolina air quality rules into one of three bins:

1. necessary with substantive public interest,
2. necessary without substantive public interest, and
3. unnecessary.

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The purpose of the binning exercise is to make recommendations regarding any rules that could possibly be removed from the rulebook and to begin the rule re-adoption process. There is also a mandate for all regulatory agencies in North Carolina to re-adopt rules within a 10-year time frame. The classification phase of the rules is the first step. The DAQ will be submitting their draft classifications to the Environmental Management Commission (EMC) beginning in January 2015 which will be followed by a public comment period. Director Holman noted that the Division of Water Resources (DWR) has just completed their public comment period on the classification of their rules. The second recent legislative change is a no more stringent than federal requirements provision.

In preparation of the re-adoption of the North Carolina air toxics rules, the DAQ thought it important for the SAB to review the twenty-one toxic air pollutants (TAPs) that are not listed as hazardous air pollutants (HAPs) by the EPA. Such an evaluation would help the DAQ determine whether these TAPs need to be retained as part of North Carolina's air toxics rules. In addition, it would be helpful if the board could also comment whether the AALs are properly set for the twenty-one pollutants. The DAQ recognizes that AALs identified for revision will require additional time to complete those evaluations. The DAQ will work with the SAB to establish the priority for AALs requiring further evaluation. This exercise will help to address the HB 74 provision prohibiting North Carolina from adopting rules that are more stringent than Federal rules. The SAB's evaluation will outline the technical case of why it is (or is not) necessary to retain these pollutants.

Director Holman indicated that although the DAQ had initially suggested a December 2014 deadline for completion of the review process for the twenty-one North Carolina TAPs, the deadline can be extended slightly as formal re-adoption of North Carolina air quality rules will occur following classification of the rules, a public comment period, and a legislative committee approval process. The DAQ is interested in as complete an evaluation as possible from the SAB. Director Holman mentioned that thus far, the preliminary DAQ staff level review has determined the majority of DAQ rules to be necessary with substantive public interest, much the same as the DWR determined for water quality rules.

Director Holman asked if there were any questions from the board. Dr. Rusyn requested clarification on the meaning of "not more stringent than federal regulations". He specifically inquired whether EPA had considered the twenty-one TAPs for listing as HAPs and deemed them not suitable to be listed or had they not considered them at all for regulatory action? Ms. Jones noted that hydrogen sulfide had originally been considered for listing as a HAP. It was erroneously listed in the 1990 Clean Air Act Amendments but was corrected and later removed. Methyl ethyl ketone (MEK) was also originally listed as a HAP but was delisted by EPA approximately 10 years ago. Dr. Rusyn noted that it appeared to be a mixture of pollutants that had not been considered and pollutants that had been de-listed. He indicated that he would be uncomfortable suggesting that a pollutant considered at the state level but not by EPA should be removed from a state pollutant list. The reason state agencies are conducting independent assessments is to fill gaps at the state level that the federal rules do not address. He suggested sorting the twenty-one TAPs into bins based on whether or not EPA had considered them.

Dr. Kenyon agreed with Dr. Rusyn and added that the driver for the selection of HAPs for EPA under Section 112 of the Clean Air Act is their importance at the national level. Pollutant toxicity, emission quantities reported in toxic pollutant inventories, and exposure considerations influenced the pollutants ultimately included on the HAPs list. However, what might be important at the federal level may be different from what is unique and important at the state level; thus the differences between the North Carolina air pollutant list and the federal air pollutant list. She indicated it would be useful for the board to have the specific criteria used by EPA in developing the federal HAPs list. Director Holman agreed to provide information on how the HAPs were listed on at the federal level. Dr. Kenyon noted the graphs of the trends of North Carolina stationary source emissions of the twenty-one TAPs (Attachment 2) will be very useful in the effort. She also noted that emissions of some TAPs clearly fall off over time (1997-2013).

Dr. Starr inquired if there were other TAPs on the list (Table 1) that were originally listed as HAPs but had been delisted. Dr. Prusiewicz responded that hexchlorodibenzo-p-dioxin is technically not included on the

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HAP list, although it appears to be treated as a HAP for EPA's emissions inventory process. This compound will likely be removed from the list. Ms. Jones added that this TAP is one of the seventeen carcinogenic dioxin and furan congeners that have 2,3,7,8-tetrachloro-p-dioxin (2,3,7,8-TCDD) toxicity equivalence factors (TEF); hence this compound is included with the HAP 2,3,7,8-TCDD in implementation. Dr. Starr noted that the hexachlorodibenzo-p-dioxins are not the least potent of the dioxin congeners, the octochlorodibenzo-p-dioxins would be the least potent.

Director Holman asked what other information the board would like the DAQ to provide. Dr. Stopford noted that MEK has dose response values under EPA's Integrated Risk Information System (IRIS). He thought it would be useful for the board to look at EPA's IRIS work for the other chemicals as well. Dr. Kenyon noted that many of the dates of the current AALs for the twenty-one TAPs are from the late 1980's when air toxics programs were initially being developed by states. During this time, an environmental air exposure value was often developed from an occupational exposure limit by dividing it by an uncertainty factor of 10 or 100 (also referred to as a factored TLV approach). That was also the timeframe when IRIS was getting started. She suggested the board use a grouping process and look at the current stationary source emissions for each pollutant in North Carolina. For example, the chlorofluorocarbons have been phased out so that is one group of TAPs that probably does not need to be examined. However, for the other pollutants, updated IRIS numbers could serve as a starting point for evaluation. Dr. Rusyn offered to send a list his research group has compiled of both oral and inhalation dose response values developed for IRIS and ATSDR along with the effective dates of the values.

Dr. Starr asked whether the five chlorofluoro compounds (CFCs) included on the list of twenty-one pollutants were banned from use and no longer manufactured or used in North Carolina. Dr. Kenyon noted that it is likely that for most of the CFC pollutants, there are no emissions because they have been banned (similar to PCBs) Ms. Jones noted that other than dichlorofluoromethane (CAS # 75-43-4), the other CFCs have been phased out. Dichlorofluoromethane is used as a refrigerant, aerosol propellant and fire extinguishing agent. It can no longer be manufactured or imported after 2015 and is prohibited from use after 2030 (according to Pub Chem and HSDB). Dr. Prusiewicz noted that DAQ is concurrently compiling a table of industrial sources and uses of the twenty-one TAPs.

Dr. Dorman questioned whether or not the SAB was expected to consider the regulatory intent of listing the twenty-one pollutants. He asked what the regulatory guidance was in determining that these compounds be originally listed. He pointed out that the compounds have been listed and if the legislature wishes to remove them, they can. He is concerned that the board is being asked to do regulatory work and as such, the bounds of their examination needs to be defined. He noted that all of the twenty-one pollutants are airborne toxicants that may produce adverse health effects and may be released into the atmosphere in North Carolina.

Dr. Stopford remembered from the mid to late 1980's that one criteria for TAPs to be listed in North Carolina was that there had to be an emission source. Since that time, some of the pollutants are no longer being emitted from stationary sources and are no longer significant pollutants in the state. He proposed that as an initial cleanup step, TAPs no longer being used and not having a stationary emission source other than landfills could be delisted. For those pollutants remaining on the list, the board could focus on whether their emitted levels are of concern to the health of our citizens. Dr. Starr questioned the landfill exemption. Dr. Stopford responded that he was referring to the TAPs that had been used as propellants whose cans had been thrown into landfills 20 years ago. Dr. Kenyon added that the board should only consider TAPs with active sources of emissions since the AALs are used for permitting purposes. Dr. Kenyon requested clarification from the DAQ regarding whether or not landfills are permitted as stationary sources for the purpose of this evaluation.

Dr. Dorman noted that clarification was needed with regard to the types of emission sources that would be considered. He wondered if commercial sources of TAPs, such as ammonia and hydrogen sulfide, should be considered when making the decisions on the TAPs (for example concentrated animal feed operations, cars, or non-stationary sources).

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Dr. Kenyon asked about the process for identifying what level of emissions would be of concern. Would toxicity be used in combination with emissions for the evaluation? Director Holman responded that the thresholds have not been set yet for this process. Dr. Prusiewicz mentioned that when the North Carolina Academy of Sciences made their original recommendations in 1987, they recommended 500 pounds emissions per year be used as the cut off for consideration. Toxicity was not part of the equation. However, compounds like dioxins with very small quantities of emissions but high toxicity should still be considered. Director Holman noted that the board's discussion raised many good questions regarding policy considerations going forward.

Dr. Rusyn asked whether the discussion was adequate or whether DAQ still needed the board to make formal recommendations for the twenty-one TAPs. Director Holman responded that this was a good start but that she would like to see some formal recommendations. Dr. Rusyn asked if a set of draft recommendations could be developed from the minutes and circulated by email for the board's consideration as an initial step. Director Holman agreed that could be done and that she also asked what additional information the board needed to facilitate their recommendations. Dr. Kenyon responded that other entities have gone through similar exercises. She said that it would be beneficial to see what other entities used as surrogates for exposure and measures of toxicity and how those two pieces of information were used for prioritization. Director Holman asked Dr. Kenyon for suggestions of such entities and Dr. Kenyon responded the federal government based on the EPA's HAPS list.

Dr. Dorman suggested the board prioritize the task in a tiered fashion. First, determine if the TAPs are from stationary or mobile sources, since the AALs are meant for stationary sources. For those TAPs from stationary sources, determine if their emissions meet the initial emissions criteria established by the North Carolina Academy of Sciences. Such an initial triage may halve the number of TAPs to look at in terms of potency and emissions. This removes some of the TAPs from the more complicated regulatory analysis where there are some pollutants that can be dangerous to a concentrated population at a low levels (which is actually) a risk management question. Dr. Dorman noted that even the development of the federal HAPs list did not follow a clearly defined algorithm (for example: all compounds with greater than 1 million pounds emissions and an LD50 less than a certain value be listed as a HAP). Politics played a role in certain compounds being listed or not listed on the Federal HAPs list. Dr. Dorman noted that he had spent a considerable amount of time in his career working with hydrogen sulfide. He noted that review of the literature shows that hydrogen sulfide was originally listed by EPA as a HAP and that Congressional intent was to include it on the HAPs list. However, political pressure influenced it being delisted.

Dr. Dorman expressed concern regarding the December deadline with regard to the time necessary to fully evaluate if AALs need to be adjusted. He recommended that the board triage the twenty-one TAP compounds to determine which TAPs needed to be examined. The triaged list would then be divided amongst board members with each taking responsibility for two or three. Individual board members would then return a recommendation to the full board.

Dr. Starr added that delisting petitions for the HAPs list have occurred frequently, but they have rarely been acted upon. The board may run into the same kind of resistance as Dr. Dorman mentioned, namely that, specific populations may have concentrated exposures to a TAP even though the yearly emissions criteria is not met. Dr. Stopford mentioned his work focusing on North Carolina hydrogen sulfide emissions from the pulp and paper industry. Dr. Starr asked if the 500 pounds limit was for a specific point source or statewide. Dr. Prusiewicz confirmed that it was statewide. Dr. Starr pointed out that a statewide number is almost impossible to convert to a fence line exposure concentration at a stationary source.

Dr. Kenyon asked Director Holman if the goal was to get to a categorization for January 2015. If the board determined that an AAL needs to be revised, there is insufficient time to accomplish the full review by January. Director Holman verified this and said if the board can provide a recommendation regarding which pollutants should be retained or omitted by the end December, the prioritization of AALs for review can be done moving forward. Dr. Stopford pointed out that what they had just stated was not consistent with the task as written. If we can do the first task to put the TAPs into the bins within the time frame, then

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the assessment of recommended AAL levels could be done in a longer time frame of a year or more. Director Holman stated that in the short term what she is really looking for is a recommendation of which of the twenty-one pollutants should be retained. The DAQ would also appreciate their assistance in crafting or reviewing the rationale for each decision. The longer term review of the retained compounds' AALs will be addressed at a later time. Dr. Dorman verified that their task will be modified in a letter to reflect what we have just discussed to which Director Holman agreed. He also asked if the DAQ could provide a definition of what is a stationary source of air pollution is under North Carolina law and are there any source types that are excluded by statute.

Other Business

Dr. Rusyn asked that the discussion of other business be conducted before the public forum. He has accepted a position at Texas A&M University and will be moving to College Station, Texas on September 1, 2014. He is interested in remaining as a NCSAB board member if desired by the Board, the DAQ and the State. He has no plans to work with the Texas Commission on Environmental Quality (TCEQ). Director Holman said that DAQ had already looked at the board's charter and there did not seem to be a problem. DAQ would be happy if he could continue and she will take this information to the Secretary of DENR. Director Holman thanked Dr. Rusyn for being a very valuable member of the board and expressed that she would be very happy for him to continue.

Public Forum

There were no comments from the public.

Planning for July 30, 2014 Meeting

Dr. Prusiewicz stated that prior to the next meeting, a revised directive clarifying some of the points brought up at this meeting will be forwarded to board members. She will also provide the board with the requested background information.

Dr. Kenyon will be unable to attend the July 30, 2014 meeting. Dr. Starr asked Dr. Kenyon to provide a list of alternative dates that she would be available. These dates could then be circulated to the board to find one where they all can all be present. Between now and then, Dr. Starr will speak with Dr. Prusiewicz about an agenda for the next meeting which will be circulated among board members for comments.

The meeting was adjourned at 3:17 PM.

Respectfully submitted,

Candace Prusiewicz, Ph.D.
Liaison, Science Advisory Board

These minutes were accepted at the 176th SAB meeting on August 6, 2014.

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Attachment 1

Directive to the North Carolina Science Advisory Board on Air Toxics (NCSAB) May 21, 2014

The Department of Environment and Natural Resources (DENR) has requested the NCSAB evaluate the twenty-one toxic air pollutants (TAPs) unique to North Carolina to determine their relevancy for North Carolina's air quality program. These chemicals (detailed in Table 1) are not included on the Federal hazardous air pollutant (HAPs) list. This request is in response to the recent changes to the North Carolina Air Toxics Rules (http://www.ncair.org/news/pr/2014/air_toxics_03132014.shtml) and to the upcoming review required by Session Law 2013-413.

The timeframe for completion of this evaluation is December 31, 2014.

Specifically, the board is tasked with the following:

- (1) Evaluate whether North Carolina requires AALs for these twenty-one pollutants. The evaluation may consider, but not be limited to, the known human health effects associated with inhalation exposures and whether the substance is currently emitted from permitted North Carolina facilities.
- (2) Recommend retention, omission, or consolidation of the twenty-one pollutants.
- (3) For retained substances, qualitatively determine if the AAL is appropriately set.
- (4) Provide clear criteria and supporting rationales for each recommendation.

Phase II of the assessment, to be conducted at a future time, will address the following question:

- (5) Are there chemical pollutants of public interest that are emitted from stationary sources in North Carolina that are not included on the list?

The NCSAB has four remaining scheduled meetings in 2014:

- May 28
- July 30
- September 24
- December 3

The board may elect to schedule more frequent meetings if deemed necessary to meet the deadline.

Division of Air Quality staff will provide logistical support for data gathering.

The final report, addressed to the DAQ Director, will be compiled by Division of Air Quality staff and reviewed and approved by the board.

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Table1: Air pollutants for review by NCSAB

Air Pollutants unique to North Carolina TAPs List	CAS No.
Acetic acid	64-19-7
Ammonia	7664-41-7
Bromine	7726-95-6
Dichlorodifluoromethane (CFC-12)	75-71-8
Dichlorofluoromethane	75-43-4
Ethyl acetate	141-78-6
Ethyl mercaptan (ethanethiol)	75-08-1
Ethylenediamine	107-15-3
Fluorides	Various
Hexachlorodibenzo-p-dioxin	57653-85-7
Hexane, isomers except n-hexane*	Various
Hydrogen sulfide	7783-06-4
Methyl ethyl ketone	78-93-3
Methyl mercaptan	74-93-1
Nitric acid	7697-37-2
Sulfuric acid	7664-93-9
Tetrachloro-1,2-difluoroethane, 1,1,2,2- (CFC-112)	76-12-0
Tetrachloro-2,2-difluoroethane, 1,1,1,2- (CFC-112a)	76-11-9
Toluene diisocyanate,2,4 and 2,6-isomers	91-08-7
Trichloro, 1,1,2- trifluoroethane, 1,2,2- (CFC-113)	76-13-1
Trichlorofluoromethane (CFC-11)	75-69-4
* Defined in 15A NCAC 02.073 as 2-methyl pentane, 3-methyl pentane, 2,2-dimethyl butane, 2,3-dimethyl butane, or any combination of these compounds	