

Rocky Mountain Arsenal Medical Monitoring Program Recommendation
Air Quality Monitoring

- I. Objective:** The Environmental Monitoring Subcommittee selected as its mission statement: “To understand, review and evaluate environmental monitoring procedures for the RMA/surrounding community and develop recommendations concerning their adequacy for meeting human health and environmental criteria during remediation.” These recommendations are intended to enhance the air quality monitoring program for the Rocky Mountain Arsenal environmental remediation.
- II Strategy:** The Subcommittee began its work by studying the RMA’s air, ground water and surface water quality environmental monitoring programs. Experts in each discipline were sought out and site tours were conducted. This allowed the Subcommittee to become informed of programmatic technical methods, goals and environmental compliance requirements. The Subcommittee concluded that its investigation and resulting recommendations should focus on the air quality and odor monitoring programs. During the RMA soil remediation, the air pathway has the greatest potential for impact on human health due to potentially harmful levels of airborne contaminants or enjoyment of personal property due to nuisance odors.
- II Background:** The primary document that describes the Remediation Venture Office’s (RVO) approach for air quality monitoring is called the RMA Site Wide Air Quality Monitoring Plan (SWAQMP), February 1998. It describes in general the air monitoring locations, methods, frequencies, and equipment. Response actions and communication and reporting protocols are also presented. Site-specific air quality monitoring plans are produced for each individual remediation project (e.g., the Burial Trenches and Munitions or Basin A Consolidation projects). While the site specific plans are tailored to accommodate the requirements of each project, they follow the conceptual approach outlined in the SWAQMP. The RVO is responsible for producing a revised version of the SWAQMP along with additional supporting documents which incorporate the Medical Monitoring Advisory Group’s (MMAG) recommendations. The RVO, along with the public health agencies which provide regulatory oversight, are responsible for ensuring the recommendations are implemented.
- Asoian Associates, a consulting firm specializing in air quality, was contracted by the Colorado Department of Public Health and Environment at the recommendation of a Subcommittee working group to provide independent technical advice to the Subcommittee. The Subcommittee assigned Asoian Associates with reviewing the SWAQMP and providing recommendations, if appropriate, for any needed improvements to the RVO’s proposed monitoring approach. In addition to attending Subcommittee and air pathway analysis working group meetings, Asoian Associates was provided with a variety of background materials including excerpts from the Record of Decision and technical documents, RMA air pathway analysis information, and site-specific air monitoring plans.
- IV Summary of Review:** The Subcommittee has reviewed the Rocky Mountain Arsenal’s Site-

Wide Air Quality Monitoring Program Plan (SWAQMP), Version 1, February 1998, as well as the recommendations provided by Asoian Associates (5/98). In terms of the overall air monitoring program at the RMA, the SWAQMP addresses only a portion of the necessary elements to assure protection of human health and the environment.

The Subcommittee believes that assuring reliable operation of an adequate monitoring network is a key element. Monitoring for appropriate chemicals, timely reporting and community assurance are important issues. An enhanced site-wide plan which incorporates MMAG recommendations, along with appropriate project-specific air monitoring plans and emission controls, should be the backbone of the air monitoring program to protect the community. When multiple projects are being remediated simultaneously, site-specific air monitoring plans must be integrated to account for the resulting combined emissions. The monitoring approach must also adequately satisfy the requirements of the "Remediation Monitoring-Medical Referral & Biomonitoring Decision Tree (10/97).

- V. Recommendations:** The Subcommittee accepts Asoian Associates recommendations (with modifications) and submits additional recommendations. The recommendations are intended to improve the air monitoring program by enhancing community assurance that its public health is protected, as well as recommendations for improving the readability and completeness of the SWAQMP document.

A. Subcommittee Recommendations

1. *Community Air Monitoring Program:* Design and implement a community air monitoring program as an integral part of the RMA site wide monitoring program. The community monitoring program design should meet the following criteria:

- a. Place monitors in at least two community locations: Montbello and Commerce City. These locations are recommended based on the prevailing wind directions and population density. Other locations should be added as appropriate.
- b. Measure for chemicals that are RMA-specific to preclude source identification problems. Use historical information and RMA soil emission data to select these contaminants of interest. Additional compounds may be measured at the RVO's discretion.
- c. Use the following factors when selecting locations:

High visibility. Place monitors for optimum community awareness. It's advantageous if local school children can readily visit the site and learn about

environmental monitoring. If mobile stations are used, periodically position the monitors in high traffic areas, such as grocery store parking lots or other community gathering areas, so that more residents can learn of the program.

Community acceptance. Seek community input in the specifics of the community air monitoring design including the locations of air monitors. Consider potential negative impacts such as noise or adverse visual consequences.

Practical needs. Access, power and security needs must be weighed along with community desires.

d. Use mobile stations as part of the community monitoring program. Mobile stations can be rapidly mobilized in response to community needs. Greater community assurance can be provided through off-site monitoring data in the event of a perceived RMA impact, such as an odor episode or a grass fire.

e. Continually evaluate state-of-the-art equipment for this program. Consider the use of field GC/MS or other real-time equipment if the corresponding detection limits provide for useful data.

2. *Visitors:* The RMA Administration Area (Building 111) is frequently accessed by visitors. Treat this area as a Visitor Destination Area in terms of air criteria limits and monitoring.

3. *Enhanced Monitoring/Expedited Response:* Enhance sampling frequency during certain instances.

Heighten frequency of air monitoring during the startup period for a new remediation activity. This is especially important for Tier 1 and 2 remediation activities and should also be implemented for Tier 3 projects, as appropriate. Enhanced frequency should be implemented in response to unexpected field conditions during project execution.

If a measurement in excess of fence line criteria is noted, expedited evaluation and response protocols should be defined in site-specific plans and implemented, as appropriate. Air exceedance coordinator should use preliminary air data to evaluate the air quality status of remediation projects (for faster response).

4. *Community Information:* Use the tools described in the Environmental Monitoring Community Outreach Plan and other methods such as the RMA enhanced computerized information system to provide community assurance that air monitoring data is accessible and complete. This will provide the community with information regarding success or failure of the

RMA cleanup in meeting acute and chronic fence line criteria.

5. Improvement to SWAQMP Document:

- a. Please define “receptors of interest” on page 2.8, first paragraph.
- b. Clarify whether the analytical suite will always be the same at the fence line (and other monitoring locations).
- c. Cite historical references.

B. Asoian Associates’ Recommendations

EXECUTIVE SUMMARY

Asoian Associates has completed its review of the Rocky Mountain Arsenal Site-Wide Air Quality Monitoring Plan (Version 1), known as the SWAQMP. It is our opinion that the SWAQMP is capable of meeting its objectives and that in conjunction with the rest of the air pathways program will adequately protect both offsite residents and onpost visitors. For all practical purposes what this means is that the SWAQMP is capable of obtaining ambient air concentration data for contaminants of concern and other compounds of interest at level equal to or lower than acceptance criteria and trigger levels which have been established. This is predicated upon the fact that the SWAQMP procedures assume that 100 percent of the VOCs monitored during real time monitoring are comprised of the driver compound specific to the remedial activity in question. It should be clearly understood that the SWAQMP or the air pathways program is not capable of protecting the public, either offpost or visitors, from exposure via the air pathway in an absolute and unconditional sense. This can only be guaranteed if zero emissions can be achieved, which is physically impossible for these remedial activities.

This report contains a number of suggestions for improving the SWAQMP. Many of the suggestions have come from the Work Group during the review process. We feel very strongly that these suggestions should be incorporated into “Version 2” of the SWAQMP. We believe it is particularly important that Mr. Jim Armstrong’s, the primary author of the SWAQMP, comments and verbal commitments made throughout the review process be put in writing and incorporated into the text. It is our belief that a Version 2 and probably a Version 3 will be required before the SWAQMP becomes the working document that it needs to be. The SWAQMP should then be reviewed and updated annually, as the remedial activities and monitoring technologies evolve.

Lastly, it is our recommendation that the interactive data management system which is currently being developed be integrated fully with the SWAQMP and the air pathways program as a whole. This program will not only facilitate managing and interpreting the data which is collected, but it will facilitate the dissemination of information and data to the public and other end users as well.

RECOMMENDATIONS

The following recommendations are a compilation of those which have been discussed and developed throughout the review process. These recommendations are excerpted from Asoian Associate's "Review of Site-Wide Air Quality Monitoring Plan (Version 1), May 1998" with modifications made by the Subcommittee. Acceptance of the SWAQMP should be based upon incorporating these recommendations into the SWAQMP and other appropriate documents.

Although the objectives and purpose of the SWAQMP are stated in and throughout the document, the foundation for the document and the readers understanding of what is about to be presented would be greatly enhanced if the objectives and purpose were clearly stated in the introduction. The SWAQMP should be reorganized to clearly state the objectives and purpose in the introduction.

As we suggested during the February 24, 1998 review meeting, a flow chart, or organizational chart, which shows the relationships and interdependencies of the various aspects of the air pathways analysis program, especially how the SWAQMP fits into the overall scheme of the program, would be very helpful. Specifically, it would be helpful to introduce the concept of the IC-APA in the introduction, taking pains to clearly show the relationship and interdependencies of the six tasks. The SWAQMP should be reorganized to show this relationship in the introduction, or possibly in a Section 2.0 dedicated to this topic.

An organization chart/list of responsible parties should be provided, e.g. who will be contacted at the TriCounty Health Department.

A list/table of the documents that are referred to but have yet to be completed should be provided. This list/table should include the expected date(s) of completion, e.g. Sampling and Analysis Plan/Quality Assurance Project Plan and who will be responsible for reviewing these documents. We suggest that either the CDPHE or a third party be designated to perform the review. The decision on who will perform the review will probably be based on the amount of trust the community has in the process and so community acceptance of the reviewing party should be obtained.

A list of acronyms and a glossary of terms should be included in the SWAQMP.

Once an acronym is introduced it should not be reintroduced in subsequent sections.

The RMA remedial activities are presented in Section 2.3. A table should be provided listing the RMA contaminants of concern (COCs). The annual IC-APA (Interactive Comprehensive Air Pathway Analysis) computer analysis and report should detail the specific compounds for each site to be remediated that year.

The maps provided, Figures 2-1 and 5-1, should be larger fold out or fold up maps showing the RMA and the surrounding community. It is our recommendation that they cover a broader area out from the fence line. In light of the new interactive data management system, we recommend that the RVO consider innovative ways of graphically representing RMA air quality status throughout the remediation.

With the new data management system, a computer user could click on a specific air monitoring location on an electronic RMA map. Information imbedded behind the map would allow for virtually any type of information to be queried and a report generated. For example, as monitoring data are entered into the system, a particular monitoring site could be clicked and the measured concentration could be compared to the allowable site-specific concentration. This allows an interested agency or the public with the ability to click on a monitoring site and compare monitored data with the criteria established for that COC or group of COCs. Frankly, incorporating the capabilities of this new system into the SWAQMP and the rest of the air pathways program resolves a lot of the issues which have arisen during the review process. To name just a few, it goes along way to solving the relationship issues between the SWAQMP and the rest of the program and solving the end user/public information concerns issues and requirements.

One of the site-specific plans should be included as an appendix. This would go a long way to filling in the questions about details which may be left hanging by the SWAQMP.

One of the concerns raised during the review process concerned instrument failure and down time. Mr. Armstrong then provided information regarding data capture performance, which is really quite good. The SWAQMP should include a statement with regard to historic data capture performance and data capture goals for the SWAQMP. The SWAQMP should also provide, as an appendix, a spare parts/instruments inventory.

A statement should be made that the RVO will consult annually with the regulatory

agencies on the need to update the SWAQMP. This would allow for the SWAQMP to be modified as the remedial activities evolve, as the community evolves, and as new monitoring and assessment techniques evolve.

We realize that action levels and acceptable criteria are still under development, however, a provision should be made to include those criteria that have been developed/agreed upon as well as making a commitment to update the SWAQMP as these criteria are developed or changed in the future. These should be presented in tabular form and tied to the data management system as discussed above.

The concept of how the IC-APA will be utilized in the design process is alluded to in the text and was discussed in some detail in the review meetings. This should be included in the text of the SWAQMP.

The SWAQMP provides a brief discussion of previous asbestos monitoring but states that it was discontinued because of no, or few, hits. Demolition of process equipment and structures known to be contaminated with asbestos, as well as polychlorinated biphenyls (PCBs) is planned. As it currently stands, it appears that the SWAQMP is not calling for either asbestos or PCB monitoring. There was some discussion about this during one of the review meetings, but it is not clear what the resolution was. If monitoring is not planned then the rationale should be explicitly stated. If it is planned (and it should be) then it needs to be included in the SWAQMP.

It was brought up during the review meetings that the SWAQMP does not mention or address monitoring for chemical agents. Again the response was unclear. Chemical agent monitoring should be conducted at sites where agent may be encountered unless compelling evidence to the contrary is provided. Appropriate procedures should be incorporated into a site-wide agent monitoring document and referenced in the SWAQMP. As the SWAQMP already provides an overall framework and approach for monitoring a variety of COCs, expanding the SWAQMP to include chemical agents will be straightforward. The same decision process and approach used for the other COCs should be employed to establish at least monitoring frequencies, locations, criteria, and detection limits for chemical agents. We assume and recommend that monitoring will be conducted near the source for chemical agents.

Real time survey instruments, such as organic vapor analyzers (OVA), will be used to measure concentrations of total volatile organic compounds for comparison with acceptance criteria. These instruments will serve as the “fire alarm” used to trigger corrective response actions if needed. Therefore, it is imperative that the procedures outlined in the plan assume that 100 percent of the VOCs detected are comprised of the driver compounds specific to that remedial activity.

Based on our understanding from discussions during the review meetings and the text of the SWAQMP, it appears that the SWAQMP will be adequate enough to protect the RMA visitors and provide an adequate (timely) warning in case of potentially hazardous chemical releases into the atmosphere. That is to say, real time monitoring which will be conducted in the proximity of the remedial activities will indicate when trigger levels have been exceeded. If trigger levels are exceeded, then action can be implemented (see Figures 6.1 and 6.2 of the SWAQMP) to control emissions and or stop work, and or evacuate visitors. However, as we have already stated, the approach which will be used should be elaborated upon, clarified, and put in writing in the text of the SWAQMP. Protecting visitors will be accomplished primarily by means of continuous real time monitors, such as OVAs (see discussion regarding OVAs above).

The SWAQMP does not specify either the chemicals/compounds to be monitored or a procedure for including/excluding compounds, although a list of COCs is available and is apparently being employed for the site specific plans that have been developed. It is our understanding from discussions during the review process that COCs have been identified based on historical records, soil and water samples, emission flux studies, and human health risk assessment criteria/evaluations. Because COCs vary from location to location, monitoring will be conducted for a different set of COCs for each remedial activity. This approach is reasonable and consistent with the SWAQMP's objectives. However, this approach should be specifically included and detailed in the SWAQMP.

A question arose during the review process as to whether or not monitoring will be conducted during off or non work hours. Clearly if integrated samples are planned for that day then monitoring will be conducted during those hours. However, it is unclear whether or not real-time VOC and SVOC (OVAs) sampling will be conducted during off hours, as this will require monitoring personnel to be present 24 hours per day. The SWAQMP should address this issue. At a minimum, the RVO should evaluate the need for periodic real-time sampling during non-working hours.

Section 5.5 discusses the use or option of using several different real-time VOC monitors that are capable of providing real-time concentration values for specific VOCs. The text and our discussions regarding whether or not these devices will be used is unclear. The SWAQMP should indicate that these options are available and that they are either going to be used or are not going to be used. It should also indicate what the basis for the decision is and whether or not it is subject to reconsideration at some point in the future. We recommend these tools be used as appropriate, if corresponding detection limits provide for useful data.

There is a brief discussion of how upwind concentrations may be subtracted from downwind concentrations to determine "source contribution". This needs to be

carefully considered and presented in great detail if it is to be included in the SWAQMP. Determining source contribution in this manner is not as simplistic as subtracting upwind levels from downwind levels. The value of including this discussion is not apparent and we recommend that it should be removed.

Although not specifically detailed in the SWAQMP, there has been discussion about using the data collected by the SWAQMP to calibrate the model used in the IC-APA with short-term monitoring data. It is our understanding the model which will be used is ISCST3. 40 CFR Ch. 1 Pt. 51, App. W Section 8.2.11 Calibration of Models specifically says that “short term model calibration is unacceptable.” We are concerned that reviewing agencies may not accept calibrated short-term results of concentrations predicted in the community. If this is the intention, then this should be discussed and approved with CDPHE and or EPA.

Although analytical turnaround times are not specifically set forth in the SWAQMP, discussions during the review process indicate that they are consistent with the current state of the practice, i.e., two to three weeks for standard turn around times and a few days to one week for expedited turn around times. Turn around times should be included in the SWAQMP.

One of our primary concerns is the fact that much of what we understand the SWAQMP to be has been conveyed verbally during the review process by Mr. Armstrong (of Foster Wheeler) on behalf of the RVO. We have every confidence that Mr. Armstrong has a complete understanding of what the SWAQMP is and how it should perform, however, Mr. Armstrong’s statements and explanations should be put in writing in the text of the SWAQMP. The SWAQMP will meet its objectives if Mr. Armstrong’s vision of it is carried out.