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THE MEMPHIS DEPOT
TENNESSEE

ADMINISTRATIVE RECORD
COVER SHEET

AR File Number 260

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MEETING MINUTES
Restoration Advisory Board
September 18, 1997
Defense Distribution Depot Memphis, TN
Commander's Conference Room

The Restoration Advisory Board meeting was held on September 18, 1997, at the Defense Distribution Depot Memphis, Tennessee (DDMT) in the Commander's Conference Room. The attendance list is attached.

Welcome and Introduction

Mr. Mondell Williams opened the meeting, welcomed the RAB members and community members, and gave an overview of the agenda for the meeting.

Old Business

Meeting Minutes Review - Mondell Williams

Mr. Williams asked if there were any questions regarding the August RAB meeting minutes. There were no changes. The minutes were accepted into the record.

Announcements - Glenn Kaden

Mr. Glenn Kaden stated that this was the last RAB before closure and that it appeared some of the community members were still worried about what was going to happen when the Depot closed. They were afraid that the Depot Environmental staff was going to walk out the gate and disappear. Mr. Kaden stated that nothing could be further from the truth and that the environmental staff was going to continue to work hard past the year 2000 to get the Depot cleaned up.

Mr. Kaden stated that the Chemical Warfare Materiel (CWM) work would not be starting in October and November. The contract was not awarded on July 31, and the workplans and safety plan could not be completed by October 1. The contract was awarded and all of the schedule slippage that had occurred should stop. The problem with the contract was money in that the contract bid was much higher than the government estimates. Those problems had been eliminated. Mr. Kaden was not conformable providing a date when the CMW work was going to be completed. The original schedule called for fieldwork to be conducted from January 20 to February 28. It was possible that it could still happen, but only if enough time was allotted for regulatory review (EPA and TDEC). Until the time schedule could be worked out, no definite dates for the work could be given. Mr. Kaden stated he had tried to do everything possible to have the contractor begin work in January.

Mr. Kaden stated that the ATSDR update site visit would be held on Tuesday, September 23 and Wednesday, September 24. Mr. John Garrison would observe on Tuesday, and Ms. Elizabeth Young would observe on Wednesday.

Mr. Garrison asked when the meeting would occur.

Mr. Kaden stated that Mr. Shawn Phillips from his office would provide this information to Mr. Garrison.

Mr. Kaden asked the RAB if they normally met in November and December. The RAB decided not to meet in November or December due to the holidays.

Mr. Williams stated that he would like to suggest that the RAB once again have an icebreaker at the beginning of the October meeting. The RAB agreed that they would have an icebreaker.

Mr. Kaden stated that field sampling training was tentatively scheduled for the October meeting. The training would include quality assurance and chain of custody. This training was one of the items that the RAB requested on the topic form. Tonight's presentation would cover toxicology, which was the first topic choice. An EPA toxicologist would cover this subject, but another toxicologist would provide further training at a later RAB meeting. Also in October there would be training on the Internet, if phone lines were available.

Mr. Kaden stated that he would let the RAB know where the meeting would be held since the Commander's Conference Room would belong to State Technical Institute of Memphis. The meeting would either be in the Commander's Conference Room or at the other end of the hall in that conference room.

Mr. Kaden stated that the RAB voted 8 to 4 to replace Mr. Larry Smith, the environmental group representative. As previously discussed, Mr. Smith had the option of recommending a replacement and had recommended Ms. Rita Harris of the Mid South Peace and Justice Center and Mr. Joseph Kyle of the Sierra Club. Mr. Kaden stated that he would contact these individuals by letter and solicit applications from them. Mr. Kaden would also notify other environmental groups and place a legal notice in local newspapers soliciting applications. The RAB would probably vote on a replacement in January. Currently the only application on file for an environmental group was DDMT-CCC. Mr. Kaden would check to see when this application was filed, since the RAB decided that they did not want applications more than six months old. If the DDMT-CCC application was more than six months old, Mr. Kaden stated he would contact them to see if they wanted their application updated.

Mr. Kaden stated that Mr. Julian Savage would no longer be the Project Manager for the Corps of Engineers in Huntsville. Ms. Dorothy Richards would be the new Project Manager.

New Business

Toxicology/EPA Risk Assessment Methodology – Dr. Ted Simon, Toxicologist, EPA Region 4

What is Risk?

Dr. Ted Simon defined risk as the probability of injury, disease, or death under specific circumstances. "We experience risk every day," he said. "For example, each time we drive our car, the lifetime chance of becoming involved in an accident or suffering some kind of loss or injury increases." He continued that public health statistics indicated that the risk of each American contracting cancer in his or her lifetime was one in three.

Human health risk at a hazardous waste site was the likelihood that people living, working, or playing nearby could experience health problems as a result of contact with, or "exposure" to hazardous substances from the site. Some chemicals were more harmful than others. The tendency of a particular chemical to cause harm was call its "toxicity."

The occurrence of potential health problems depended on the toxicity of the chemicals at a site, the amount of chemicals to which a person might be exposed, and the length of time the exposure lasted.

Risk Assessment

To evaluate the potential risk to human health and the environment at a hazardous waste site, EPA used a procedure known as risk assessment. For example, experts were able to use the number of automobile accidents in past years to assess the actual risk of driving. EPA had no similar set of statistics for risk from hazardous waste and must make predictions of risk based on models and assumptions rather than actual measurements. This was the source of so-called uncertainty in risk assessment.

Because of uncertainty, EPA used assumptions that tended to overestimate the predictions of risk.

There were naturally occurring chemicals in the soil such as lead and arsenic. There were also organic chemicals that occurred from human activity that would be wide spread. Some types of chemicals, such as PAHs, occurred around railroad tracks or roads where internal combustion engines were located. There were also location specific chemicals, such as the pesticides at the golf course on the Depot.

EPA has a "hit list" of chemicals that when found on a site were compared to background sampling and to risk-based screening values.

For a risk to occur:

- A hazard must exist.
- Exposure must occur.

The basic questions asked by a risk assessment:

- How bad was the site now?
- How bad could it become if nothing was done?
- Do site conditions warrant active remediation?
- What cleanup levels would be used?

The Four Steps of Risk Assessment

The four-step process used by the EPA for risk assessment was based on recommendations of the National Research Council, an independent advisory board that helped the government with scientific issues.

Step 1: Hazard Identification
Obtain samples of water, soil, air, and sometimes, plants or animals from the site and analyzed to determine what chemicals were present, their locations, and their concentrations.

Step 2: Exposure Assessment
People may come in contact with chemicals through air, water, soil, food, or other "pathways." For each pathway, determine the amount of the chemical that could enter a person's body via the "routes" of the lungs, the digestive system, or the skin.

Did people live or work on or near the site? Had children played on or near the site? Did people drink or shower in water contaminated with chemicals from the site? Did people eat fish from streams or lakes contaminated by chemicals from the site? Risk assessors attempted to model exposure by choosing assumptions to answer these and other questions related to peoples' contact with hazardous chemicals.

There may be hazardous chemicals at a site buried deep in the ground or otherwise unavailable for human contact. In such a case there was no exposure, and the pathway would be considered incomplete.

Step 3: Toxicity Assessment
Toxicity indicated the poisonous or harmful nature of a substance. Generally, EPA based its predictions on animal studies because few human studies existed. Health problems varied depending on the chemical and the dose. EPA grouped these health problems into two types: cancer and all others (non-cancer).

Studying animals and humans provided sources for toxicity information. Groups studying toxicity were the IRIS (Integrated Risk systems, Hearst Health Effects Assessment), and Provincial Values from the National Center for Environmental Assessment.

Dr. Simon used mothballs as an example of a toxic substance that people commonly used in their homes.

Ms. Peters asked what mothballs would do to you.

Dr. Simon stated that mothballs could make you dizzy, but it would take more than placing them around your house. To get dizzy a person would have to open a box of mothballs on a hot day in their car and sit there for a long time.

Mr. Williams asked if you used a chemical would it get onto the skin and in the body.

Dr. Simon stated that any chemicals that did not cause cancer would no longer be a problem, whereas the chemicals that did cause cancer could, 20 years from now, result in cancer.

Mr. Bradshaw asked if being exposed to a chemical could cause birth defects in several generations of children.

Dr. Simon stated that it would affect the first generation, but not the next generation.

He reiterated that without exposure there was no risk.

Exposure pathways:

- Ingestion – eat or drink
- Inhalation – get in lungs
- Dermal – on skin

Mr. Bradshaw asked if any chemicals moved from the Fluvial Aquifer to the Memphis Sands Aquifer, would that pose a health threat.

Dr. Simon stated that it would depend on the concentration and the level of those chemicals in the Memphis Sands Aquifer. It was the dose of a chemical that determined whether it was poisonous.

Mr. Jordan English stated that it depended on what one drank not necessarily what was in the water supply. Most volatiles are removed during the aeration methods, if there were any in the water in the first place.

Mr. Bradshaw stated that Memphis was putting all of their emphasis on preventing the water supply from being contaminated more than cleaning up the supply after it was contaminated; therefore Memphis did not have all the other safety systems in place to check to see if the water was already contaminated.

Mr. Williams asked that Dr. Simon continue the presentation, then answer questions from the public.

Step 4: Risk Characterization

The results of the exposure and toxicity assessments were combined to estimate the risks and whether the risks were great enough to cause human health problems. For cancer-causing substances (carcinogens), the estimate of risk was presented as a probability that a person would develop cancer over a lifetime due to exposure to chemicals present. For non-carcinogens, a comparison was made between the predicted level of exposure and a

threshold level that the EPA believed was safe. These threshold levels were called "Reference Doses." Reference doses used in risk assessments were 10 to 10,000 times smaller than experimental doses found to be safe in a laboratory setting.

Generally, EPA did not require cleanup if cancer risks were lower than 1 in 10,000 and the exposure levels of non-carcinogens were less than the reference dose.

Public Comment

Ms. Peters stated that she appreciated Dr. Simon being so honest.

Ms. Bradshaw asked if EPA had changed the risk assessment model from a white male to include children.

Dr. Simon stated that EPA conducted two risk assessments. EPA considered a child differently from an adult because they weighed less, ate more dirt, drank less water, and spent more time outside. A lot of those exposure assumptions came from these studies.

Ms. Bradshaw stated that the models were based on white males that weighed 150 pounds. EPA has stated that they were going to change the model.

Dr. Simon stated that there was a national working group studying this issue, and he was on the work group. At this time they were studying different sizes and characteristics of people in determining risk.

Mr. Bradshaw asked about multiple sources of contamination.

Dr. Simon stated that EPA considers multiple chemical risks. They added up the multiple sources in consideration of the contamination.

Mr. Bradshaw asked if the risk assessment considered a wide variety of chemicals.

Dr. Simon stated that the risk assessment considered a wide variety of poisons and toxins and that it did not necessarily accurately portray the risk. Risk assessment gave a risk estimate of the upper level.

Mr. Bradshaw asked what about exposure to a lot of small chemicals at small doses for a long time, a chronic exposure of small doses for a lot of years, 25 – 30 years.

Dr. Simon stated that it was a difficult situation, but EPA tried to study the chemical mixtures. EPA added up the different chemicals to do an assessment.

Mr. Bradshaw asked if you did not have contaminated water in the Fluvial Aquifer, then why would you spend millions and millions of dollar to pump and treat it and remove it, if there was no way that it could get into the drinking water.

Mr. Webb stated that it was because of the potential risk to the drinking water that the pump and treat was being implemented.

Mr. Bradshaw asked if there was 100 feet of impenetrable clay between the aquifers why would you spend millions of dollars for pumping and treating for 30 or 40 years, if there was no way to get to the other aquifer.

Dr. Simon stated that he had not seen the groundwater results. Dr. Simon stated that in general with the amount of groundwater contamination that the government did not have the money to cleanup all of this groundwater contamination. At this time the government was looking at other methodologies, including natural attenuation.

Mr. Bradshaw asked if it was illegal to contaminate a potential source of drinking water, a violation of the Safe Drinking Water Act.

Dr. Simon stated that groundwater was considered a valuable resource that would be protected whenever possible.

Ms. Bradshaw asked how EPA dealt with lead.

Dr. Simon stated EPA knew more now about lead. EPA regulations were based on the predicted amount of lead in someone's blood. Lead could be gotten from soil, house dust, drinking water, and from inhaling the dust.

Ms. Bradshaw asked if a woman was exposed to lead when she was expecting a child, would that lead be passed on to the child and have an effect on a child's learning ability.

Dr. Simon answered that it would have an effect.

Since there were no more questions, the meeting was adjourned.
The next RAB meeting was scheduled for 6:00 p.m. on Thursday, October 16, 1997.

Attendance List

Restoration Advisory Board Members

Mr. Glenn Kaden	DDMT, Facility Co-Chairman
Mr. Mondell Williams	Community Co-Chairman
Mr. Jordan English	TDEC
Mr. Carter Gray	MSCHD
Mr. John Garrison	Citizen Representative
Ms. Johnnie Mae Peters	Citizen Representative
Mr. Dave Bond	Citizen Representative
Mr. Eugene Brayon	Citizen Representative
Ms. Terri Gray	Citizen Representative
Ms. Elizabeth Young	Citizen Representative
Mr. Ramon Torres	EPA
Mr. Ulysses Truitt	Citizen Representative
Mr. James Webb	MLG&W
Ms. Janet Hooks	Memphis City Council
Ms. Jacqueline Smith for Dr. Cleo Kirk	Shelby County Commission

Others in Attendance

Dr. Ted Simon	EPA
Mr. Rick Bowlus	USACHPPM
Mr. Greg Underberg	CH2M HILL
Ms. Vijaya Mylavarapu	CH2M HILL
Mr. Julian Savage	Corps of Engineers, Huntsville
Ms. Sherrye Wheeler	MSCHD
Mr. Benjamin Moore	ATSDR
Mr. Mike Dobbs	ASCE
Mr. John DeBack	Base Transition Office
Mr. Shawn Phillips	DDMT
Ms. Georgetta Phipps	DDMT
Mr. Kenneth Bradshaw	Citizen
Ms. Doris Bradshaw	Citizen
Mr. Russell Ray Anderson	Citizen
Ms. Sue Estes	MEs, L.L.C.

Defense Logistics Agency
Defense Distribution Depot Memphis

Restoration Advisory Board

Agenda

September 18, 1997

DDMT Commander's Conference Room
2163 Airways Boulevard
Memphis, Tennessee

Welcome and Introduction

Mr. Glenn Kaden
BEC, DDMT-DE
Facility Co-Chairman

Old Business

Meeeting Minutes Review		Mr. Mondell Williams Community Co-Chairman
Announcements	20 Min	Mr. Glenn Kaden

New Business:

Toxicology/EPA Risk Assessment Methodology	45 Min	Dr. Ted Simon EPA Region 4 Toxicologist
Public Comment Period	25 Min	
Meeting Adjourned		

United States
Environmental Protection Agency
Region 4

Waste Management Division
345 Courtland Street, NE
Atlanta, GA 30365

Office of Health Assessment

Ted W. Simon, Ph.D. DABT

(404) 347-1586
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UNDERSTANDING RISK ASSESSMENT

June, 1996

WHAT IS RISK?

Risk is the probability of injury, disease, or death under specific circumstances.

THERE IS NO SUCH THING AS ZERO RISK!

We experience risk every day. For example, each time we drive our car, the lifetime chance of becoming involved in an accident or suffering some kind of loss or injury increases. Public health statistics indicate that the risk of each American contracting cancer in his or her lifetime is one in three.

Human health risk at a hazardous waste site is the likelihood that people living, working or playing nearby could experience health problems as a result of contact with, or "exposure" to hazardous substances from the site. Some chemicals are more harmful than others. The tendency of a particular chemical to cause harm is called its "toxicity."

The occurrence of potential health problems depends on the toxicity of the chemicals at a site, the amount of chemicals to which a person might be exposed and the length of time the exposure lasts.

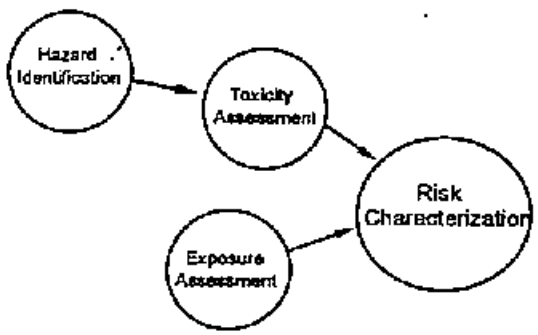
REDUCING RISK IS EPA'S FIRST PRIORITY!

RISK ASSESSMENT

To evaluate the potential risks to human health and the environment at a hazardous waste site, EPA uses a procedure known as risk assessment. For example, experts are able to use the number of automobile accidents in past years to assess the actual risks of driving. EPA has no similar set of statistics for risk from hazardous waste and must make predictions of risk based on models and assumptions rather than actual measurements. This is the source of so-called uncertainty in risk assessment.

Because of uncertainty, EPA uses assumptions that tend to overestimate the predictions of risk. The actual number and seriousness of health problems will generally be lower than that predicted by EPA.

EPA'S RISK ASSESSMENT MODEL



EPA is using risk assessment to help guide cleanup and land re-use efforts at Homestead Air Reserve Base.

THE FOUR STEPS OF RISK ASSESSMENT

The four step process used by the EPA for risk assessment is based on recommendations of the National Research Council, an independent advisory board that helps the government with scientific issues.

Step 1: Hazard Identification
Samples of water, soil, air, and sometimes plants or animals are obtained from the site and analyzed to determine what chemicals are present, their locations and their concentrations.

Step 2: Exposure Assessment
People may come in contact with chemicals through air, water, soil, food, or other "pathways." For each pathway, the amount of the chemical that could enter a person's body via the "routes" of the lungs, the digestive system or the skin.

Do people live or work on or near the site? Do children play on or near the site? Do people drink or shower in water contaminated with chemicals from the site? Do people eat fish from streams or lakes contaminated by chemicals from the site? Risk assessors attempt to model exposure by choosing assumptions to answer these and other questions related to peoples' contact with hazardous chemicals.

There may be hazardous chemicals at a site buried deep in the ground or otherwise unavailable for human contact. In such a case there is no exposure, and the pathway is considered incomplete.

WITHOUT EXPOSURE, THERE IS NO RISK!

Step 3: Toxicity Assessment
Toxicity means the poisonous or harmful nature of a substance. Generally, EPA bases its predictions on animal studies because few human studies exist. Health problems varies depending on the chemical and the dose. EPA groups these health problems into two types: cancer and all others (non-cancer).

Carcinogens:	*Chemicals that cause cancer.*
Non-carcinogens:	*Chemicals that cause harmful effects other than cancer.*

Step 4: Risk Characterization
The results of the exposure and toxicity assessments are combined to estimate the risks at Naval Base Charleston and whether the risks are great enough to cause human health problems. For carcinogens, the estimate of risk is presented as a probability that a person will develop cancer over a lifetime due to exposure to chemicals present at the base. For non-carcinogens, a comparison is made between the predicted level of exposure and a threshold level that the EPA believes is safe. These threshold levels are called "Reference doses." Reference doses used in risk assessment are 10 to 10,000 times smaller than experimental doses found to be safe in a laboratory setting.

The results of the risk assessments performed at Homestead ARB help EPA and the state of Florida decide whether to undertake cleanup. Generally, EPA does not require cleanup if cancer risks are lower than one-in-ten-thousand and the exposure levels of non-carcinogens are less than the reference dose.

GLOSSARY:

Chemicals of Potential Concern (COPCs) - chemicals found at a hazardous waste site that have potential human health impacts. Determination of COPCs is the initial step in a risk assessment.

Chemicals of Concern (COCs) - chemicals shown by the risk assessment to have human health impacts. Risk management decisions address the presence and levels of COCs.

Upper Confidence Limit (UCL) - a conservative statistical estimate of the mean or average concentration in a given environmental medium.

Receptor - a human or animal that might contact a hazardous substance.

Applicable and/or Relevant and Appropriate Requirements (ARARs) - Federal or State Standards such as those in the Safe Drinking Water Act or the Clean Air Act that may serve as cleanup goals.

Naturally occurring background levels - ambient concentrations of chemicals present in the environment that have not been influenced by human activities. Generally considered only with inorganic chemicals such as iron, aluminum or manganese.

Intake - a measure of exposure expressed as the mass of a substance contacted per unit body weight per unit time i.e. mg/kg-day. Generally, intakes are averaged over a long time, up to a lifetime.

Exposure - contact of an organism with a chemical or physical agent. Exposure is quantified as the amount of the agent available for absorption by the organism.

Exposure Assessment - the determination or estimation of the magnitude, frequency, duration and route of exposure.

Exposure Route - the way a chemical enters the body of a receptor, i.e. ingestion, inhalation or dermal contact.

Exposure Point - a location of a potential contact between a receptor and a chemical.

Exposure Pathway - The course a chemical takes from a source to an exposed organism. An exposure pathway includes a source, a transport medium, an exposure point and an exposure route. It is a unique mechanism by which a receptor is exposed to chemicals originated from a site.

Reference Dose (RfD) - an estimate of a daily exposure level for the human population, including sensitive subpopulations, that is likely to be without an appreciable risk of adverse effects (excluding cancer) during a lifetime.

Cancer Slope Factor (CSF) - also called a potency factor. A plausible upper bound estimate of the probability of a cancer response per unit intake of a chemical over a lifetime. The CSF is used to estimate an upper bound probability of an individual developing cancer as a result of exposure to a particular level of a hazardous substance.

Hazard Quotient (HQ) - the ratio of a single substance exposure level to the RfD for that substance.

Hazard Index (HI) - the sum of more than one HQ for multiple substances and/or multiple pathways.

Cancer Risk - a unitless probability representing the incremental chance of an individual developing cancer over a lifetime.

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