



KELLY AFB
TEXAS

ADMINISTRATIVE RECORD
COVER SHEET

AR File Number 3276

Kelly Restoration Advisory Board

Technical Review Subcommittee

Meeting Agenda

March 12, 2002, 6:30 p.m.

Environmental Health & Wellness Clinic

911 Castroville Road

(previously Las Palmas Clinic)

- | | |
|---|-----------------------------|
| I. Introduction | Dr. Gene Lené |
| a. Agenda Review and Handouts | |
| b. Approval of February TRS Minutes | |
| II. TAPP Report | Dr. Katherine Squibb |
| ATSDR Report | |
| III. Semi-Annual Compliance Plan | Mr. William Ryan |
| IV. Charter Review Subcommittee Update | Mr. Doug Karas |
| V. Administrative | Dr. Gene Lené |
| a. BCT Update (BCT scheduled for March 18 th) | |
| b. Spill Summary Report | |
| c. Documents to TRS/RAB | |
| d. Action Items | |
| VI. Agenda/Location/Date/Time of Next TRS Meeting | |
| a. Request for Agenda Items | |
| b. Environmental Health and Wellness Clinic/ May 14, 2002 / 6:30 p.m. | |
| VII. Adjournment | 9:00 p.m. |

March 2002

Draft
MEETING MINUTES
KELLY AFB TECHNICAL REVIEW SUBCOMMITTEE (TRS)
TO THE RESTORATION ADVISORY BOARD (RAB)

12 March 2002
 SAMHD Health and Wellness Center

Attendees

- Dr. Gene Lené, Community Co-Chair
- Ms. Tanya Huerta, Community RAB Member
- Ms. Katherine Ramos, Community RAB Alternate
- Ms. Mary Martinez, Community Attendee
- Mr. George Rice, Community RAB Member
- Ms. Esmeralda Galvan, Community RAB Member
- Mr. Ben Galvan, Community RAB Alternate
- Mr. Larry Bowman, Community RAB Member
- Mr. Robert Silvas, Community RAB Member
- Mr. Doug Karas, Air Force Base Conversion Agency (AFBCA)
- Mr. Don Buelter, AFBCA
- Mr. Dan Zatopek, AFBCA
- Mr. Mark Weegar, Texas Natural Resource Conservation Commission (TNRCC)
- Ms. Laura Stankosky, United States Environmental Protection Agency (USEPA)
- Mr. Rick Rogus, CH2M Hill
- Mr. Mark Stoker, CH2M Hill
- Mr. Scott Lampright, Bexar County Fire Marshall – Environmental Management
- Dr. Katherine Squibb, Johns Hopkins University
- Mr. Sam Sanchez, San Antonio Metropolitan Health District (SAMHD)
- Ms. Kyle Cunningham, SAMHD
- Mr. Curt Pearson, SAMHD
- Ms. Lisa Sorg, San Antonio Current
- Mr. Eddie Martinez, Booz Allen Hamilton (Booz Allen)
- Mr. Tim Sueltnan, Booz Allen
- Mr. Hugh Farr, Booz Allen
- Ms. Patty Smith, Facilitator

I. Introduction

The meeting began at 6:33 P.M. Ms. Patty Smith introduced herself as the facilitator for the meeting and directed the meeting towards Dr. Gene Lené. Dr. Lené began the meeting by confirming that everyone had received the TRS meeting agenda. He stated that item four of the agenda would be addressed prior to item two. Dr. Lene suggested waiting until the next TRS meeting to approve the meeting minutes from the February meeting since some members had not brought the minutes that were given to them in the February RAB packages.

II. Charter Review Subcommittee Update

Mr. Doug Karas stated that the second RAB Charter Review Subcommittee meeting, thus far, had focused on the mission statement, and guiding principals. Mr. Karas added that he wanted to address the more difficult issues first, and address the easier ones after these had been resolved. He stated that he believed the charter review subcommittee would complete their work by mid-April.

III. TAPP Report

Dr. Katherine Squibb gave the TRS a presentation on the review of the Petitioned Public Health Assessment conducted by the Agency for Toxic Substances and Disease Registry. See Attachment

Discussion

Ms. Angel Martinez asked what constituted a volatile material and if cause and effect determination was difficult to prove. Dr. Squibb responded by saying that it depended on concentration. Mr. Robert Silvas stated that he was an employee at Kelly USA and he had witnessed fuel spills. Mr. Silvas added that he had witnessed his boss brining in bottled water and not drinking water from the taps in his place of work. Ms. Esmeralda Galvan stated that the study should be monitoring different sites because she has seen cases of rashes and other illnesses within the community.

Ms. Tanya Huerta asked why the risk-based standards were different. Mr. Mark Weegar responded by saying that states are allowed to set their own standards. He added that 3.14 times ten to the negative six is their cleanup goal statewide. Mr. Larry Bowman then asked what ten to the negative sixth meant. Mr. Weegar responded by saying that it meant that a person had a one in a million chance of getting cancer above and beyond an unexposed person. Mr. Weegar added that it is like one person in a million within the normal population. Ms. Huerta then asked if there was a fact sheet that gave the numbers so that the community could use as a reference. She stated that she thought the community would greatly benefit from having this information.

Ms. Galvan then asked if there existed studies on the dangers of all the chemicals in communities outside of San Antonio. Mr. Silvas then asked who had performed those studies. Ms. Martinez then asked how anyone could say all is well when lead and metal contamination is not safe. Dr. Squibb responded to all three questions by saying that the build up of metals and leads occurs in the soil and that constant monitoring and testing were key. Ms. Huerta asked what RBC meant. Ms. Laura Stankosky replied, saying that the US EPA uses the term and that it stands for Risk Based Criteria. She added that it is used to calculate health risks in contaminated areas.

Mr. Silvas asked where Benzene was mostly derived from. Dr. Lené replied that benzene is mostly derived from fuel. Mr. Sam Sanchez then asked if there was a pathway into people's homes and if there was how much would it be. Dr. Squibb said the chances are one in a million. Mr. Sanchez then stated that more testing needed to be done. Mr.

Sanchez also asked if it would make a good case if the pathway were complete. Dr. Squibb replied it would only work if there were crawlspaces. Ms. Huerta asked how that could be validated. Dr. Squibb responded by saying that that could only be done through current testing. Ms. Galvan then asked how long the testing model has been in use. Dr. Squibb replied that the model has been recently applied but that she did not know if it had been used in older neighborhoods. Mr. George Rice stated that the model assumes that all the homes studied have concrete slabs. Dr. Squibb replied that geology, and not housing style was the primary criteria. Mr. Rice then asked if the model was used nationally. Dr. Squibb responded by saying that the models have different variables. She added that as an example, concrete slabs actually enhance the pathway and that it can be a preferential pathway. She also stated that this was the case unless a crawlspace existed, which could dissipate the effect of contamination. She further stated that real-time testing helped determine that plumbing connections are the preferential pathways. Dr. Squibb also stated that the model is mostly used for radon testing. Mr. Silvas asked that since the modeling was performed off base, was any related on base. Dr. Squibb said no. Ms. Huerta asked if the study was small. Mr. Weegar said the study was performed based on RAB recommendations and that the model was used to evaluate areas with elevated soil gas, to confirm soil gas, and that there was no excess risk from soil gas. He added that it was slightly above 1 to the negative 10.

Ms. Sanchez asked if Dr. Squibb recommended indoor air monitoring. Dr. Squibb said yes. Mr. Weegar then stated that in terms of testing, other chemicals co-mingle with other chemical sources, such as chemicals used in dry cleaning. He added that perchloroethene (PCE) is primarily a cleaning fluid and that it can influence the outcome of the indoor air monitoring. Mr. Silvas stated there were not that many people on the south side who got their clothes dry cleaned. Ms. Huerta asked why there was so much testing for PCE. Mr. Weegar stated that high concentrations of PCE and the rate at which it volatilizes was the reason for so much testing. Mr. Don Buelter added that it was important to remember that PCE is less volatile than trichloroethene (TCE). Ms. Huerta then added that its higher concentration means that it takes longer to get up and out of the groundwater. Ms. Martinez asked if it takes years for a spill to migrate off base, why then does it only take minutes for it to blow into the neighborhood. Dr. Squibb said that referred to air pollution. Dr. Squibb also added that the only system of measurement was soil gas monitoring wells. Ms. Huerta then asked where other comments regarding modeling had come from. Dr. Squibb replied that the comments she had seen had come from other public health professionals. She added that the cancer slope factor had added risk from other VOCs present. Dr. Lené then asked if cases of asthma had been seen in terms of VOCs. Dr. Squibb responded by saying that asthma was very difficult in terms of determining direct causality. She added that allergies often exacerbate asthma and can contribute to the problem. Ms. Huerta asked if there were any reproductive issues associated with the study. Dr. Squibb said evidence suggests development effects exist at higher concentration levels and that more laboratory studies need to be performed. Ms. Huerta asked if the Agency for Toxic Substances and Disease Registry (ATSDR) official data ignored birth defects or abnormalities in their studies. She also asked if 1997 was as far back as the study had gone. Dr. Squibb replied that cancer data has a 20-year lag factor. Birth defect data is more current, usually as recent as within the

last 6 months. She also said that cardiac abnormalities are related. Mr. Rice asked if certain chemicals could be traced to specific organ problems. He also asked if risk could be established based on disease. Dr. Squibb replied by stating that hazard indexes was the measuring tool used to determine risk. Mr. Rice also asked if this tool was being used throughout the country. Dr. Squibb said yes. Ms. Katherine Ramos then stated that the ATSDR should be granted a greater data-collecting mandate. Dr. Squibb said that the best route would be to speak to the appropriate elected officials. Mr. Weegar stated that the AFBCA was asked by the Texas Natural Resource Conservation Commission to do more soil sampling during the warmer times of the year. Ms. Huerta asked if increased rain might effect the sampling outcome. Mr. Weegar replied that an elevated water table could affect the data that is collected. He concluded saying that this might also dilute the concentration, but barring that, groundwater lessens the concentration amounts and also decreases the volatilization rate. Ms. Galvan then asked if the TRS, RAB or community were advised that soil sampling occurred. Mr. Buelter stated that testing was first requested of the AFBCA by the RAB. Ms. Laura Stankosky added that vinyl chloride, soil testing, as well as new sampling locations was where the greatest amount of give and take can occur. She concluded by saying that the most important thing is to do additional monitoring, do not rely on one result.

Ms. Huerta then asked why vinyl chloride was being tested. Mr. Weegar responded saying that the decision was made to test it because it is the worst of all of the contaminants. Ms. Huerta asked how increases in vinyl chloride are produced during the breakdown of other chemicals. Mr. Weegar stated that the contaminants that have thus far been detected are all that have been determined. He added that Zephyr's recommendation to the city has been to do continuous monitoring. Ms. Galvan then asked how long did long-term mean. Dr. Squibb replied two to three years. Ms. Galvan then asked if air monitoring at the highest plume areas was the best approach. Dr. Squibb said that is was. Ms. Huerta asked if there were any noncarcenogenic effects such as learning disabilities. Mr. Silvas then asked if certain groups were at a greater risk than others were. Dr. Squibb replied saying that young children and the elderly were at increased risk due to their changing immune systems. Mr. Silvas asked if exposure to contaminants was greater on or off base. Dr. Squibb replied that it was greater on base. Ms. Huerta asked what Dr. Squibb had meant by saying additive effects. Dr. Squibb said that some studies indicate that additive effects decreased on a mixture by mixture basis depending on exposure rates. Consistent hourly exposure is likely to increase contamination effects.

Ms. Martinez stated that the conclusion as far as she was concerned was that there is no real health risk based on the sampling that has been done thus far unless the testing occurs at people's homes. She added that the modeling that has been done cannot be taken factually because it is playing with data to serve the government's own ends. Dr. Squibb replied that it is important for people to do their own monitoring and data collecting, but that it was also important to be ready to ask oneself the hard questions concerning the data and what sorts of steps can be made to alleviate the situation. Dr. Lené stated that lead has been a problem. Mr. Rice stated that almost a year ago local area vegetables had been studied. He asked if the results from the study were available.

Mr. Sanchez stated that the results have come in this week but that his preference was to allow an outside scientist to view the data and make a judgement. Ms. Huerta asked if Mr. Sanchez was refusing to discuss the report publicly. Mr. Sanchez stated that he simply felt more comfortable having an independent expert, toxicologist or food scientist to review the study and comment on what the findings demonstrate. Ms. Kyle Cunningham stated that cactus had not been tested. Mr. Sanchez stated that another round of testing was planned because further interpretation of the data collected was needed. Mr. Curtis Pearson stated that the San Antonio Metropolitan Health District (SAMHD) is expecting to have the next set of results at the next RAB. Mr. Silvas then asked how much validity there was to the hypothetical modeling used in the TAPP report. Dr. Squibb replied that it was all real. She later remarked to the importance of installing additional monitoring wells. Dr. Lené then reminded everyone that any questions to the TRS would be due by the 19th of March. Dr. Lené asked for any other questions or comments from the audience and called for a ten-minute break.

IV. Semi Annual Compliance Plan

See Attachment

Mr. Buelter introduced Mr. Rick Rogus. Mr. Rogus delivered the Semi Annual Compliance Plan report. Mr. Silvas asked how long the sampling had been done. Mr. Rogus said since 1994. Mr. Sam Murrah asked where the sampling had been performed. Mr. Rogus stated that some had been done out by the San Antonio River. Ms. Martinez asked what the purpose of the two new monitoring wells was. Mr. Rogus responded saying that he did not know why they were there. Mr. Murrah then stated that he must have been referring to sampling wells. Mr. Silvas asked of all the zones, which had seen the highest level of contamination. Mr. Rogus said Zone 3. Mr. Sanchez asked if the San Antonio River had been sampled. Mr. Rogus said yes, sampling had gone on in July. Mr. Bowman then asked why sampling did not occur in July and August. Mr. Rogus stated that the July report covered January through June but excluded the annual sampling. He added that September was solely reserved for water sampling. Mr. Weegar then added that the reason for the selected months for sampling were mandated by the state. Mr. Bowman then asked if anyone was performing water testing during July. Mr. Weegar replied, saying that work is being done at all times on the site and that some sites might still be in an investigation stage. Ms. Huerta asked if private individuals were doing their own testing. Mr. Weegar then stated that the Semi Annual Compliance Plan under AFBCA mandated testing by the TNRCC. Mr. Rice then asked what length of time had the testing been performed. Mr. Rogus said it had been done over a four-week period. Mr. Bowman asked who was taking the samples. Mr. Rogus replied saying that contracted hydrogeologists had done the work. Mr. Murrah asked if the location of sampling was helpful in determining what sorts of contaminants were coming off from Kelly. Mr. Rogus said yes and that there was a monitoring station above the highway that had been established to determine what was coming from Kelly. Ms. Huerta asked what fish were being sampled for. Mr. Rogus stated that it was mostly for pesticides and mercury. Mr. Murrah asked if there was a control group north of the base that was helping to determine if there were any differences in the fish sampling results. Mr.

Rogus replied by saying that the movement of fish makes it difficult to be certain where contamination came from. Mr. Rogus added that testing was also being conducted in Salado Creek. Ms. Ramos asked if any invertebrate sampling was being performed. Mr. Rogus said yes and that all individual creatures get tested. Ms. Huerta asked how anyone would know based on looking at the maps. Mr. Rogus responded saying that the two maps show the regulatory limits on contamination. Mr. Rogus added saying that the maps also show well concentration. Ms. Galvan asked how the remediation was being done. Mr. Rogus said that pump and treat was being done off base. He added that it was helping to keep the plume from going off base, but that it was not treating contaminants that had already migrated off base. Mr. Scott Lampright asked what results were determined from metals. Mr. Rogus said that metals are found constantly in certain spots. Ms. Huerta asked if he could identify the stations where the metals were being found. Mr. Rogus said that he was not certain which station the results had come from. Mr. Rice asked if the results were three out of five stations. Mr. Rogus replied by saying that yes, three out of the five stations had detected contaminants and that the report was far more detailed. He added that the presence of metals in fish is not uncommon. Mr. Silvas asked if a spill at a storm drain occurred, would monitoring detect it. Mr. Rogus said yes. He added that if a spill happens it will be detected. He concluded saying that the United States Geologic Survey (USGS) does perform sampling. Mr. Bowman asked what the purpose of the presentation was. Mr. Rogus stated that his goal was to provide a brief overview of the activities at Leon creek. Mr. Weegar added that one of the main focuses of the testing was for groundwater volatiles. Ms. Galvan asked if any pesticides had been found. Mr. Rogus answered saying that despite the fact that they had been banned, they can still be found. Ms. Huerta stated that at the February RAB meeting, the RAB members learned that the fish at Brackenridge Park were more contaminated than those in Leon Creek. Mr. Silvas asked if more testing could be done than what currently has taken place. Mr. Rogus said yes, but asked for a clarification. Mr. Weegar said that if an impact occurs, the TNRCC requests the AFBCA to propose a remedial action to control the matter. The next step he said is for the AFBCA to evaluate the data followed by bringing that information to the TNRCC for their input. He said AFBCA and TNRCC are mandated to respond upon determining that an impact has occurred. Mr. Buelter added to the exchange saying that the AFBCA started testing at Leon Creek. Ms. Huerta asked if testers enter the water. Mr. Rogus said yes and that they wear waders.

V. Administrative

Mr. Buelter stated that the BCT report would not be available until March 18, 2002. Mr. Doug Karas said that the AFBCA knows that Boeing had had a spill, but that no official report from them has been issued. Mr. Silvas said he could confirm that a spill took place and that he heard it was in the amount of 200 or more gallons and that there was no way to contain it. He added that he understood that the fuel had gotten into the storm drain and that another spill from the KC 135 aircraft might have been larger. Mr. Rice asked if the issue of a fuel spill by Boeing had been underreported. Mr. Weegar stated that the issue was hearsay until an official investigation occurred. Mr. Silvas said that the plane itself has a computer that monitors its fuel levels. He added that those responsible for securing the aircraft know this and that they knew about the spill. Mr. Weegar said that if anything wrong had occurred at the Boeing Corporation, the information needed to be

reported in order for an investigation to begin. Mr. Silvas said that he came forward and that the TNRCC regional office offered no assistance. Mr. Rice stated that he believed the proper response would be to perform an interview. Mr. Weegar then said that TNRCC regulations require voluntary compliance. He added that facilities have annual inspections. Mr. Rice said that Mr. Weegar's answer indicated a lack of concern on the part of the TNRCC. Mr. Weegar expressed his disagreement with Mr. Rice's position and repeated the fact that TNRCC regulations were based upon voluntary compliance. He added saying that most people want to do the right thing. He said that unless someone is willing to provide documentation, TNRCC is not permitted to take action. Ms Huerta asked if a spill is taking place, can one remain around it and not be effected. Mr. Weegar stated that the regional office came and performed a test and they indicated that they smelled fuel. He added that during the last legislative session, the regulations changed as far as how an investigation can proceed. He also said that regional offices have limited resources and that it is not possible for field agents to police every reported violation. He concluded saying that if someone knows about a spill that has occurred, it is important to get that information to the proper authorities so an investigation can begin.

At this point in the meeting, Ms. Laura Stankosky of EPA said that this would be her last *meeting*. She said she had enjoyed working with the group and wished everyone well.

Mr. Eddie Martinez reminded everyone that the February RAB minutes had been placed within the packets of their folders and for them to please bring those with them to the April RAB meeting

Action items: AFBCA to provide the ATSDR website or fact sheet for risk analysis data to the RAB members.

William Ryan is coordinating with the city to present City Council's recommendations on Zone 4 CMS.

The next meeting was proposed for May 14, 2002

Mr. Rice asked when Mr. Sanchez would have the fruit and nut sampling report ready. Mr. Sanchez replied saying he envisioned bringing it to the next RAB meeting. Mr. Sanchez added that he needed at least a 30-day turnaround time on the report to confirm the report's findings.

Meeting adjourned 9:02 PM.

7S
MINUTAS DE LA JUNTA

**Subcomité de Revisión Técnica (TRS, por sus siglas en inglés) de la Base de la Fuera
Aérea de Kelly
Junta Asesora de Restauración (RAB, por sus siglas en inglés)**

12 de marzo de 2002

Centro para el Bienestar y la Salud Ambiental del Área Metropolitana de San Antonio

Asistentes:

Dr. Gene Lené, Copresidente representando a la comunidad
Srta. Tanya Huerta, Miembro representando a la comunidad en el RAB
Srta. Katherine Ramos, Sustituta representando a la comunidad en el RAB
Srta. Mary Martínez, Asistente representado a la comunidad
Sr. George Rice, Miembro representando a la comunidad en el RAB
Srta. Esmeralda Galván, Miembro representando a la comunidad en el RAB
Sr. Ben Galván, Sustituto representando a la comunidad en el RAB
Sr. Larry Bowman, Miembro representando a la comunidad en el RAB
Sr. Robert Silvas, Miembro representando a la comunidad en el RAB
Sr. Dough Karas, Agencia de Conversión de Bases de la Fuerza Aérea (AFBCA, por sus siglas en inglés)
Sr. Don Buelter, AFBCA
Sr. Dan Zatopek, AFBCA
Sr. Mark Weegar, Comisión para la Conservación de Recursos Naturales de Texas (TNRCC, por sus siglas en inglés)
Srta. Laura Stankosky, Agencia de Protección Ambiental de los Estados Unidos (USEPA, por sus siglas en inglés)
Sr. Rick Rogus, CH2M Hill
Sr. Mark Stoker, CH2M Hill
Sr. Scott Lampright, Jefe de Bomberos del Condado de Bexar — Administración Ambiental
Dr. Catherine Squibb, Universidad de Johns Hopkins
Sr. Sam Sánchez, Distrito Metropolitano de Salud de San Antonio (SAMHD, por sus siglas en inglés)
Srta. Kyle Cunningham, SAMHD
Sr. Curt Pearson, SAMHD
Srta. Lisa Sorg, *San Antonio Current*
Sr. Eddie Martínez, Booz Allen Hamilton (Booz Allen)
Sr. Tim Sueltenfuss, Booz Allen
Sr. Hugh Farr, Booz Allen
Srta. Patty Smith, Facilitador

I. Introducción

La reunión inició a las 6:33 de la tarde. La Srta. Patty Smith se presentó a sí misma como facilitadora de la junta y pasó la dirección de la junta al Dr. Gene Lené. El Dr. Lené empezó la junta confirmando que todos habían recibido la agenda de la junta del TRS. Indicó que el punto cuatro de la agenda sería tratado antes del punto dos. El Dr. Lené sugirió esperar hasta la siguiente junta del TRS para aprobar las minutas de la junta de febrero puesto que algunos miembros no habían traído las minutas que se les habían entregado en los paquetes del RABde febrero.

II. Actualización del Subcomité de Revisión de Estatutos

El Sr. Doug Karas indicó que la segunda junta del Subcomité de Revisión de Estatutos del RAB hasta ahora se había enfocado en el enunciado de misión y principios guía. El Sr. Karas añadió que deseaba enfocarse en las cuestiones más difíciles primero, y luego en las más fáciles después de que aquéllas hubiesen sido resueltas. Dijo que creía que el Subcomité de Revisión de Estatutos completaría su trabajo para mediados del mes de abril.

III. Reporte del Programa de Asistencia Técnica y Participación Pública (TAPP, por sus siglas en inglés)

La Dra. Katherine Squibb dio al TRS una presentación sobre la revisión de la Solicitud de Evaluación de Salud Pública llevada a cabo por la Agencia para el Registro de Sustancias Tóxicas y Enfermedades (ATSDR por sus siglas en inglés). Ver el Anexo.

Discusión

La Srta. Ángel Martínez preguntó qué era un material volátil y si la determinación de causa y efecto era difícil de probar. La Dra. Squibb respondió diciendo que dependía de la concentración. El Sr. Robert Silvas dijo que él era un empleado en Kelly USA y que había presenciado derrames de combustible. El Sr. Silvas añadió que había visto a su jefe llevar agua embotellada y no tomar agua de la llave en el lugar de trabajo. La Srta. Esmeralda Galván indicó que el estudio debería estar enfocado en diferentes sitios porque ella ha visto casos de salpullido y otras enfermedades dentro de la comunidad.

La Srta. Tanya Huerta preguntó por qué los estándares basados en riesgo eran diferentes. El Sr. Mark Weegar respondió diciendo que a los estados se les permite fijar sus propios estándares. Añadió que 3.14 multiplicado por 10^{-6} es su meta de limpieza del estado. El Sr. Larry Bowman preguntó qué significa diez al negativo seis. El Sr. Weegar respondió que significaba que una persona tiene una posibilidad en un millón de enfermarse de cáncer por arriba de una persona no expuesta. El Sr. Weegar añadió que es como una persona en un millón dentro de la población normal. La Srta. Huerta luego preguntó si había una hoja de datos que proporcionara los números para que la comunidad la usara como referencia; indicó que pensaba que la comunidad se beneficiaría grandemente al tener esta información.

La Srta. Galván preguntó si existen estudios sobre los peligros de todos los productos químicos en comunidades fuera de San Antonio. El Sr. Silva preguntó entonces quién había llevado a cabo esos estudios. La Srta. Martínez preguntó cómo es que alguien puede decir

que todo está bien cuando la contaminación con plomo y metales no es segura. La Dra. Squibb respondió a las tres preguntas diciendo que la acumulación de metales y plomo ocurre en el suelo y que el monitoreo y las pruebas constantes son la clave. La Srta. Huerta preguntó qué significa RBC. La Srta. Laura Stankowky respondió diciendo que la USEPA usa el término y que quiere decir Criterio Basado en Riesgos. Añadió que se usa para calcular los riesgos para la salud en áreas contaminadas.

El Sr. Silvas preguntó de dónde se deriva principalmente el benceno. El Dr. Lené respondió que el benceno se deriva principalmente del combustible. El Sr. Sam Sánchez preguntó si había una trayectoria hacia los hogares y si así era, de cuánto sería. La Dra. Squibb dijo que las posibilidades son una en un millón. El Sr. Sánchez indicó que necesitaban hacerse más pruebas. El Sr. Sánchez también preguntó si se tendría un buen caso si la trayectoria estuviera completa. La Dra. Squibb respondió que sólo funcionaría si hubiera espacios muy pequeños. La Srta. Huerta preguntó cómo se podría validar eso. La Dra. Squibb respondió diciendo que eso podría hacerse solamente a través de pruebas actuales. La Srta. Galván preguntó cuánto tiempo ha estado en uso el modelo de prueba. La Dra. Squibb respondió que el modelo ha sido aplicado recientemente, pero que no sabía si había sido usado en vecindarios más antiguos. El Sr. George Rice dijo que el modelo asume que todas las casas estudiadas tienen losas de concreto. La Dra. Squibb respondió que la geología, y no el estilo de las casas, era el criterio principal. El Sr. Rice preguntó si el modelo se usaba a escala nacional. La Dra. Squibb respondió que los modelos tienen diferentes variables y añadió que como un ejemplo, las losas de concreto de hecho realzan la trayectoria y que pueden ser una trayectoria preferencial. También dijo que éste era el caso a menos que existiera un espacio pequeño, lo que podría disipar el efecto de la contaminación. Indicó que las pruebas de tiempo real ayudaron a determinar que las conexiones de plomería eran las trayectorias preferenciales. La Dra. Squibb dijo que el modelo se usa principalmente para pruebas aleatorias. El Sr. Silvas preguntó qué modelo se usaba fuera de la base, si había alguno relacionado en la base. La Dra. Squibb dijo que no. El Sr. Huerta preguntó si el estudio era pequeño. El Sr. Weegar dijo que el estudio se llevaba a cabo basándose en las recomendaciones del RAB, y que el modelo se usaba para evaluar las áreas con niveles altos de gas en el suelo, para confirmar la presencia de gases en el suelo, y que no había riesgo excesivo de gases en el suelo. Añadió que estaba ligeramente arriba de 1 al negativo 10.

La Srta. Sánchez preguntó si la Dra. Squibb recomendaba el monitoreo del aire en el interior. La Dra. Squibb dijo que sí. El Sr. Weegar luego indicó que en términos de pruebas, otros productos químicos se mezclan con otras fuentes de productos químicos, tales como los químicos usados en el lavado en seco, añadiendo que el percloroetileno (PCE por sus siglas en inglés) se usa principalmente como un fluido de limpieza y que puede influenciar el resultado del monitoreo del aire en el interior. El Sr. Silva dijo que no había tantas personas en el lado sur que llevaran su ropa a lavar en seco. El Sr. Huerta preguntó por qué había tantas pruebas para el PCE. El Sr. Weegar dijo que las altas concentraciones de PCE y la velocidad a la que se volatiliza eran las razones de la gran cantidad de pruebas. El Sr. Don Buelter añadió que era importante recordar que el PCE es menos volátil que el tricloroetileno (TCE por sus siglas en inglés). La Srta. Huerta añadió que la concentración más alta significa que se lleva más tiempo para elevarse y salir del agua subterránea. La Srta. Martínez preguntó que si toma años para que un derrame emigre fuera de la base, por qué entonces toma solamente unos minutos en soplar hacia el vecindario. La Dra. Squibb

dijo que eso se refería a la contaminación del aire. La Dra. Squibb añadió que el único sistema de medición eran los pozos de monitoreo de gases en el suelo. La Srta. Huerta preguntó entonces de dónde habían llegado otros comentarios relacionados con los modelos de prueba. La Dra. Squibb respondió que los comentarios que había visto habían venido de otros profesionales de la salud pública, añadiendo que el factor de tendencia al cáncer había añadido riesgo de otros productos químicos presentes. El Dr. Lené preguntó entonces si los casos de asma habían sido vistos en términos de compuestos orgánicos volátiles (VOCs por sus siglas en inglés). La Dra. Squibb respondió diciendo que es muy difícil determinar las causas directas del asma, añadiendo que las alergias exacerban el asma y pueden contribuir al problema. La Srta. Huerta preguntó si habían descubierto problemas reproductivos en el estudio. La Dra. Squibb dijo que la evidencia sugiere que existen efectos en el desarrollo a concentraciones altas y que necesitan llevarse a cabo más estudios de laboratorio. La Srta. Huerta preguntó si los datos oficiales de la Agencia para el Registro de Sustancias Tóxicas y Enfermedades (ATSDR por sus siglas en inglés) ignoraron los defectos o anomalías de nacimiento en sus estudios. También preguntó si se había realizado el estudio en 1997. La Dra. Squibb respondió que los datos sobre el cáncer tienen un factor de rezago de 20 años. Los datos de defectos de nacimiento son más actuales, por lo general tan recientes como en los últimos seis meses. También dijo que hay una relación con las anomalías cardíacas. El Sr. Rice preguntó si ciertos productos químicos pueden relacionarse con problemas en ciertos órganos, preguntando también si el riesgo podría establecerse con base en la enfermedad. La Dra. Squibb respondió que los índices de peligros eran la herramienta de medición usada para determinar el riesgo. El Sr. Rice también preguntó si se estaba usando esta herramienta en todo el país. La Dra. Squibb dijo que sí. La Srta. Katherine Ramos dijo que a la ATSDR se le debería otorgar un mandato para mayor recopilación de datos. La Dra. Squibb dijo que la mejor ruta sería hablar con los funcionarios elegidos apropiados. El Sr. Weegar dijo que la Comisión para la Conservación de Recursos Naturales de Texas le pidió a la AFBCA que llevara a cabo más muestreos de suelos durante los meses más calurosos del año. La Srta. Huerta preguntó si el aumento en las lluvias puede afectar el resultado del muestreo. El Sr. Weegar contestó que una elevada capa freática puede afectar la información que se recopila, y concluyó diciendo que también puede diluir la concentración; pero excepto por eso, el agua subterránea disminuye las cantidades de concentración y también disminuye la tasa de volatilidad. La Srta. Galván preguntó si se avisó al TRS, al RAB o a la comunidad de lo que estaba ocurriendo el muestreo de suelos. El Sr. Buelter dijo que las pruebas fueron solicitadas al AFBCA por el RAB. La Srta. Laura Stankosky añadió que el cloruro de vinilo, las pruebas del suelo, así como las nuevas localidades de muestreo es donde puede ocurrir la mayor cantidad de concesiones mutuas, y concluyó diciendo que lo más importante es efectuar monitoreo adicional, no confiar en un resultado.

La Srta. Huerta preguntó por qué se estaban haciendo pruebas sobre el cloruro de vinilo. El Sr. Weegar respondió que se tomó la decisión de efectuar pruebas porque es el peor de todos los contaminantes. La Srta. Huerta preguntó cómo se produce aumento en el cloruro de vinilo durante la descomposición de otros productos químicos. El Sr. Weegar indicó que los contaminantes que se han detectado hasta ahora son todos los que se han determinado, y añadió que la recomendación de Zephyr a la ciudad ha sido llevar a cabo monitoreo continuo. La Srta. Galván preguntó qué significa a largo plazo. La Dra. Squibb respondió que dos a tres años. La Srta. Galván preguntó si el monitoreo del aire en las áreas de pluma

más alta era el mejor enfoque. La Dra. Squibb dijo que sí era. La Srta. Huerta preguntó si había efectos no carcinogénicos tales como dificultades de aprendizaje. La Dra. Squibb dijo que los niños pequeños y los ancianos tenían mayor riesgo debido a sus sistemas inmunológicos cambiantes. El Sr. Silvas preguntó si la exposición a los contaminantes era mayor en o fuera de la base. La Dra. Squibb respondió que era mayor en la base. La Srta. Huerta preguntó lo que la Dra. Squibb quiso decir con "efectos adicionales". La Dra. Squibb dijo que algunos estudios indican que los efectos adicionales disminuyeron sobre la base de mezcla por mezcla, dependiendo de los grados de exposición. La exposición consistente hora tras hora es probable que aumente los efectos de la contaminación.

La Srta. Martínez dijo que la conclusión en lo que a ella concierne es que no hay ningún riesgo real para la salud con base en el muestreo que se ha hecho hasta ahora, a menos que las pruebas ocurran en las casas. Añadió que el muestreo de modelos que se ha efectuado no puede tomarse con objetividad porque se está haciendo con datos que sirven a los propósitos del propio gobierno. La Dra. Squibb dijo que es importante que la gente efectúe su propio monitoreo y recopilación de datos, pero que también es importante estar listo para hacerse a uno mismo las preguntas difíciles relacionadas con los datos y qué tipo de casos se pueden tomar para mejorar la situación. El Dr. Lené dijo que el plomo ha sido un problema. El Sr. Rice indicó que hace casi un año se habían estudiado los vegetales de áreas locales y preguntó si estaban disponibles los resultados del estudio. El Sr. Sánchez dijo que los resultados han llegado en esta semana, pero que él prefería que un científico externo revisara los datos y emitiera su juicio. La Srta. Huerta preguntó si el Sr. Sánchez se estaba negando a discutir el informe públicamente. El Sr. Sánchez dijo que él simplemente se sentía más cómodo si un experto independiente, toxicólogo o científico experto en alimentos revisara el estudio y emitiera sus comentarios sobre lo que demostraban los hallazgos. La Srta. Kyle Cuningham dijo que no se habían efectuado pruebas en los nopales. El Sr. Sánchez dijo que se planeaba otra ronda de pruebas porque era necesaria una interpretación posterior de la información recopilada. El Sr. Curtis Pearson dijo que el Distrito Metropolitano de Salud de San Antonio (SAMHD por sus siglas en inglés) espera tener el siguiente grupo de resultados para la próxima junta del RAB. El Sr. Silvas preguntó cuánta validez había en relación al modelo hipotético usado en el reporte del TAPP. La Dra. Squibb contestó que era totalmente real, y posteriormente enfatizó la importancia de instalar pozos de monitoreo adicionales. El Dr. Lené recordó a todos que las preguntas para el TRS se podrían formular solamente hasta el 19 de marzo. El Dr. Lené preguntó si había otras preguntas o comentarios del público y dio un receso de 10 minutos.

IV. Plan de Cumplimiento Semestral

Ver el Anexo.

El Sr. Buelter presentó al Sr. Rick Rogus. El Sr. Rogus presentó el reporte del Plan de Cumplimiento Semestral. El Sr. Silvas preguntó qué tanto tiempo se había llevado a cabo el muestreo. El Sr. Rogus dijo que desde 1994. El Sr. Sam Murrah preguntó dónde se había hecho el muestreo. El Sr. Rogus dijo que una parte se había efectuado afuera cerca del Río San Antonio. La Srta. Martínez preguntó cuál era el propósito de los dos nuevos pozos de monitoreo. El Sr. Rogus respondió diciendo que no sabía por qué estaban los pozos allí. El Sr. Murrah dijo entonces que se debe haber estado refiriendo a los pozos de muestreo. El

Sr. Silvas preguntó de todas las zonas, cuál había tenido el nivel más alto de contaminación. El Sr. Rogus dijo que la Zona 3. El Sr. Sánchez preguntó si se habían tomado muestras del Río San Antonio. El Sr. Rogus dijo que sí, que el muestreo había sido en julio. El Sr. Bowman preguntó por qué el muestreo no ocurrió en julio y agosto. El Sr. Rogus dijo que el reporte de julio cubría el periodo de enero a junio, pero excluía el muestreo anual. Añadió que septiembre estaba reservado solamente para el muestreo de agua. El Sr. Weegar añadió que la razón de la selección de los meses para el muestreo era que así lo ordenaba el Estado. El Sr. Bowman entonces preguntó si alguien estaba llevando a cabo pruebas en el agua durante julio. El Sr. Weegar respondió que se está llevando a cabo trabajo en todo momento en el sitio y que algunos sitios pueden todavía estar en una etapa de investigación. La Srta. Huerta preguntó si individuos privados estaban efectuando sus propias pruebas. El Sr. Weegar dijo que el Plan de Cumplimiento Semestral bajo la AFBCA ordenaba que el TNRCC efectuara pruebas. El Sr. Rice luego preguntó por cuánto tiempo se habían efectuado las pruebas. El Sr. Rogus dijo que durante un período de cuatro semanas. El Sr. Bowman preguntó quién estaba tomando las muestras. El Sr. Rogus respondió que hidrogeólogos contratados habían efectuado el trabajo. El Sr. Murrah preguntó si la ubicación del muestreo ayudaba a determinar qué tipo de contaminantes estaban saliendo de Kelly. El Sr. Rogus dijo que sí y que había una estación de monitoreo arriba de la carretera que se había establecido para determinar qué estaba saliendo de Kelly. La Srta. Huerta preguntó para qué contaminantes se estaban tomando las muestras de los peces. El Sr. Rogus dijo que mayormente para pesticidas y mercurio. El Sr. Murrah preguntó si había un grupo de control al norte de la base que estaba ayudando a determinar si había diferencias en los resultados de muestreo de peces. El Sr. Rogus respondió que el movimiento de los peces hace difícil asegurar de dónde vienen los contaminantes, y añadió que las pruebas también se estaban llevando a cabo en Salado Creek. La Srta. Ramos preguntó si se estaban llevando a cabo pruebas en invertebrados. El Sr. Rogus dijo que sí y que se llevan a cabo pruebas en todas las criaturas individuales. La Srta. Huerta preguntó cómo podría alguien enterarse viendo los mapas. El Sr. Rogus respondió diciendo que los dos mapas muestran los límites reglamentarios de contaminación y añadió que los mapas también muestran la concentración de pozos. La Srta. Galván preguntó cómo se estaban llevando a cabo las acciones correctivas. El Sr. Rogus dijo que el bombeo y el tratamiento se estaban llevando fuera de la base. Añadió que eso estaba ayudando a evitar que la pluma saliera de la base, pero que no se estaban tratando los contaminantes que ya habían emigrado de la base. El Sr. Scott Lampright preguntó qué resultado se había determinado con relación a los metales. El Sr. Rogus dijo que se encuentran metales constantemente en ciertos puntos. El Sr. Huerta preguntó si podría identificar las estaciones en que se han encontrado metales. El Sr. Rogus dijo que no estaba seguro de cuál estación habían provenido los resultados. El Sr. Rice preguntó si los resultados eran tres de cinco estaciones. El Sr. Rogus contestó que sí, que tres de cinco estaciones habían detectado contaminantes y que el informe era mucho más detallado, y añadió que la presencia de metales en los peces es común. El Sr. Silvas preguntó si el monitoreo detectaría un derrame en un drenaje de agua de lluvia. El Sr. Rogus dijo que sí y añadió que si sucede un derrame, será detectado. Concluyó diciendo que el Estudio Geológico de Estados Unidos (USGS por sus siglas en inglés) lleva a cabo el muestreo. El Sr. Bowman preguntó cuál era el propósito de la presentación. El Sr. Rogus dijo que su meta era proporcionar un breve resumen de las actividades en Leon Creek. El Sr. Weegar añadió que uno de los enfoques principales era llevar a cabo pruebas para detectar materia volátil en el agua subterránea. La Srta. Galván

preguntó si se habían encontrado pesticidas. El Sr. Rogus contestó diciendo que a pesar del hecho de que habían sido prohibidos, todavía se pueden encontrar. La Srta. Huerta dijo que en la junta del RAB de febrero, los miembros del RAB se enteraron de que los peces en Brackenridge Park estaban más contaminados que los de Leon Creek. El Sr. Silvas preguntó si se podían efectuar más pruebas de las que se estaban llevando a cabo actualmente. El Sr. Rogus dijo que sí, pero pidió una aclaración. El Sr. Weegar dijo que si ocurre un impacto, el TNRCC solicita al AFBCA que proponga una acción correctiva para controlar el asunto. El siguiente paso, dijo, es que la AFBCA evalúe los datos, seguido de llevar tal información al TNRCC para que le den entrada. Dijo que al AFBCA y al TNRCC se les ordena que respondan al determinar que ha ocurrido un impacto. El Sr. Buelter dijo que la AFBCA empezó a hacer pruebas en Leon Creek. La Srta. Huerta preguntó si los encargados de las pruebas entran al agua. El Sr. Rogus dijo que sí y que usan botas altas impermeables.

V. Asuntos Administrativos

El Sr. Buelter indicó que el reporte del Equipo de Limpieza del BRAC estaría disponible hasta el 18 de marzo del 2002. El Sr. Doug Karas dijo que la AFBCA sabe que Boeing tuvo un derrame, pero que no habían emitido un informe oficial. El Sr. Silvas dijo que él podía confirmar que hubo un derrame y que escuchó que fue de 200 galones o más y que no había manera de contenerlo. Añadió que había entendido que el combustible había llegado al drenaje de agua de lluvia y que otro derrame del avión KC 135 puede haber sido más grande. El Sr. Rice preguntó si el problema de un derrame de combustible de Boeing se había quedado sin reportar. El Sr. Weegar indicó que el asunto era de oídas hasta que se llevara a cabo una investigación oficial. El Sr. Silvas dijo que el avión mismo tiene una computadora que vigilaba sus niveles de combustible y que los responsables de asegurar la aeronave saben esto y que ellos sabían del derrame. El Sr. Weegar dijo que si algo malo había ocurrido en la Boeing Corporation, necesitaba reportarse la información para que se empezara una investigación. El Sr. Silvas dijo que él trató de investigar y que la oficina regional del TNRCC no ofreció ayuda. El Sr. Rice indicó que él creía que la respuesta apropiada sería llevar a cabo una entrevista. El Sr. Weegar entonces dijo que las reglamentaciones del TNRCC requieren un cumplimiento voluntario a las mismas y añadió diciendo que las instalaciones tienen inspecciones anuales. El Sr. Rice dijo que la respuesta del Sr. Weegar indicaba una falta de preocupación por parte del TNRCC. El Sr. Weegar expresó su desacuerdo con la posición del Sr. Rice y repitió el hecho de que las reglamentaciones del TNRCC se basan en cumplimiento voluntario y añadió que la mayor parte de la gente quiere hacer lo correcto. Dijo que a menos que alguien esté dispuesto a proporcionar información, no se permite que el TNRCC tome ninguna acción. La Srta. Huerta preguntó que si al haber un derrame, puede uno quedarse alrededor del mismo y no resultar afectado. El Sr. Weegar dijo que la oficina regional llegó y llevó a cabo una prueba, e indicaron que percibían el olor a combustible. Añadió que durante la última sesión legislativa, las reglamentaciones cambiaron en cuanto a cómo puede proceder una investigación. También dijo que las oficinas regionales tienen recursos limitados y que no es posible que los agentes de campo supervisen cada violación que se reporte. Concluyó diciendo que si alguien sabe que hubo algún derrame, es importante comunicar esa información a las autoridades apropiadas para que pueda empezar una investigación.

En ese punto de la reunión, la Srta. Laura Stankosky de la EPA dijo que ésta sería su última junta, que había disfrutado trabajando con el grupo y que deseaba lo mejor para todos.

El Sr. Eddie Martínez recordó a todos que las minutas del RAB habían sido colocadas dentro de los sobres de sus paquetes de información y que por favor las llevaran con ellos a la junta del RAB de abril.

Puntos de acción: La AFBCA proporcionará el sitio de la red de Internet o una hoja informativa del ATSDR con los datos del análisis de riesgos a los miembros del RAB.

William Ryan está coordinando con la ciudad para presentar las recomendaciones del Ayuntamiento sobre el CMS de la Zona 4.

Se propuso la siguiente reunión para el 14 de mayo del 2002.

El Sr. Rice preguntó cuándo tendría listo el Sr. Sánchez el informe de muestreo de la fruta y la nuez. El Sr. Sánchez dijo que él esperaba llevarlo a la siguiente junta del RAB y añadió que necesitaba cuando menos un tiempo de 30 días con relación al informe para confirmar lo que había encontrado en el informe.

La reunión concluyó a las 9:02 de la noche.



January 2002 Semiannual Compliance Plan Report (July-December 2001)

Report Summary

Presentation to the TRS
March 12, 2002



Project Scope

- ◆ Fulfill the TNRCC Compliance Plan requirements (monitoring and reporting).
- ◆ Conduct an annual assessment of the interim remedial action systems.
- ◆ Provide an annual "snapshot" of groundwater contamination.



Compliance Monitoring Breakout

- ◆ 14 Waste Management Areas (SWMUs)
- ◆ 4 RCRA-permitted units
- ◆ Leon Creek



Sampling

- ◆ Annual GW sampling of Waste Management Areas.
- ◆ Semi-annual GW sampling of four RCRA-regulated units (SA-2, SD-1, E-3, S-8).
- ◆ Semi-annual water level measurements.
- ◆ Annual biological sampling of Leon Creek.
- ◆ Semi-annual surface water/sediment sampling of Leon Creek.



Annual WMA Sampling

- ◆ Sampled 455 wells during April-June 2001

- ◆ Samples analyzed for VOCs, SVOCs, metals, cyanide, pesticides/PCBs (Zone 2 only).



Semi-annual Sampling of four RCRA Units

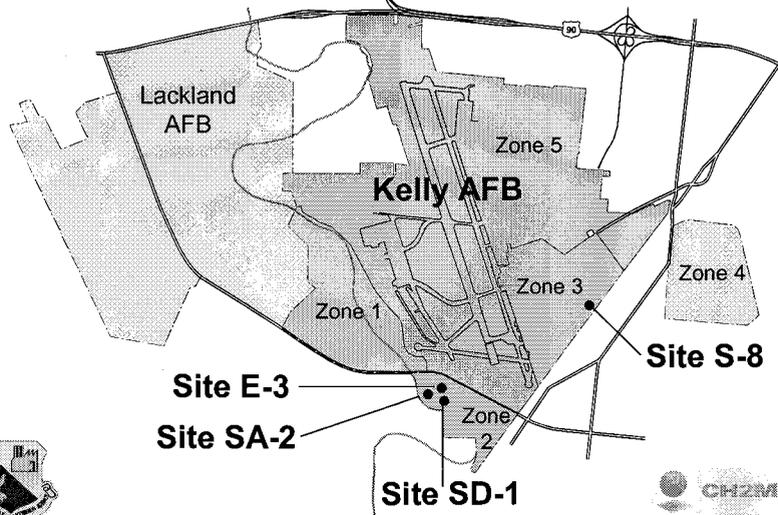
- ◆ Sampled 37 wells during July 2001

- ◆ Wells monitor the following sites:
 - SA-2, SD-1 and E-3 (Zone 2)
 - S-8 (Zone 3)

- ◆ Samples analyzed for VOCs, SVOCs, metals, cyanide, pesticides/PCBs (Zone 2 only)



4 RCRA-Regulated Units



Semi-Annual Water Level Measurements

- ◆ Water levels were measured during September 2001.
- ◆ Approximately 400 wells were measured during this event.
- ◆ Wells are checked for total depth, GW level, and any free product that might be on the water.



Leon Creek Monitoring

- ◆ Physical Assessment
- ◆ Chemical Assessment
- ◆ Biological Assessment



Physical Assessment of Leon Creek

- ◆ During July 2001 we measured:
 - Stream flow in 4 segments.
 - Flow from selected seep and outfalls.
 - Surface water elevations at 20 stations.
- ◆ Also created sketches and took photographs to document changes in the stream's physical appearance.



Chemical Assessment of Leon Creek

- ◆ During July 2001 we sampled:
 - 16 surface water stations.
 - 15 sediment stations.
 - 3 outfalls and 3 seeps.
 - Analyze samples for VOCs, SVOCs, metals, cyanide, pesticides/PCBs



Biological Assessment of Leon Creek

- ◆ During July 2001 we conducted:
 - Chronic Toxicity testing at 5 stream stations.
 - Fish tissue sampling at 5 stream stations.
 - EPA Rapid Bioassessment at 5 stream stations.



2001 Results for the Annual Sampling

- ◆ Decreases in the magnitude of chlorinated solvents in the source areas and just downgradient of the remedial systems has been shown to be occurring in the following areas:
 - Zone 4 off-base plume
 - Around recovery systems in Zone 2 near Leon Creek
 - WP022 (E-3) Source area
 - Downgradient of Site SS040 (MP)



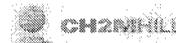
Annual Sampling Frequency of Detection/ Min/Max

- ◆ VOCs
 - PCE - 44% Min: 0.5 ug/L Max: 13,000 ug/L
 - TCE - 62% Min: 0.3 ug/L Max: 30,000 ug/L
 - DCE - 67% Min: 0.3 ug/L Max: 310,000 ug/L
 - VC - 23% Min: 0.3 ug/L Max: 23,000 ug/L
- ◆ SVOCs, Pesticides and PCBs were only detected around 1-2% in low concentrations



RCRA Sampling Results

- ◆ VOC concentrations in the shallow groundwater have been greatly reduced at E-3.
- ◆ SD-1 and SA-2 monitoring indicates that there is no impact to shallow groundwater from these sites.
- ◆ S-8 monitoring indicates that natural degradation is occurring.



RCRA Sampling Frequency of Detection

- ◆ VOCs
 - PCE - 22% Min: 0.7 ug/L Max: 80 ug/L
 - TCE - 41% Min: 0.3 ug/L Max: 79 ug/L
 - DCE - 76% Min: 0.4 ug/L Max: 140 ug/L
 - VC - 40% Min: 0.3 ug/L Max: 22 ug/L
- ◆ SVOCs, Pesticides and PCBs were only detected in approximately 1% of the samples.



Leon Creek Sampling Results

- ◆ 3 SW and 15 sediment contaminants exceeded TWQS guidelines
- ◆ Chronic Toxicity results showed potential SW toxicity at 1 station to fathead minnows and potential sediment toxicity at 2 stations for green algae.
- ◆ Pesticide contamination was found in several of the fish species
- ◆ Sensitive fish species were identified downstream of Kelly AFB.



Leon Creek

- ◆ Trend analysis shows that Leon Creek has remained fairly constant over the years
- ◆ Alternative Impairment causes
 - Travels through highly urbanized areas
 - Low flow
 - Shallow pools which heat in the summer
 - Lack of shade in many parts



MEETING SUMMARY

CHARTER REVIEW SUBCOMMITTEE

RESTORATION ADVISORY BOARD for the FORMER KELLY AIR FORCE BASE

Meeting Date: March 12, 2002

Participation: George Rice, Armando Quintanilla, Doug Karas, Hillary Naab, Katherine Ramos, David Smith, and Patti Smith

Accomplishments: (A) Second revision of Mission Statement (See 1.4)
(B) Initial revision of Statement of Purpose to include 2.4.6.

Meeting Schedule for balance of March, 2002:

March 19

March 25

All meetings will take place from 6:00PM to 8:00PM in
Conference Room #1 (AFBCA Offices)

Remaining "Big Picture" items are the focus of discussion for March 19 meeting.

Statement of Purpose (Part Two)

Guiding Principles (Section 3.2)

Board Member Responsibilities (Section 3.3)

Expiration (Section 3.6)

If you have ideas on these documents that you want committee members to preview before the next meeting please send them to the e-mails on the sign-in roster (except Mr. Quintanilla, who will send/receive by fax).

MEETING SUMMARY

CHARTER REVIEW SUBCOMMITTEE

RESTORATION ADVISORY BOARD
for the
FORMER KELLY AIR FORCE BASE

Meeting Date: March 5, 2002

Participation: All members and support personnel present (see attached list.)

Accomplishments: (A) Developed working format and elected to approach the Charter revision task in three broad working areas:

1. **Big Picture** which includes Mission Statement (Part One), Statement of Purpose (Part, Two), Guiding Principles (Section 3.2), Board Member Responsibilities (Section 3.3), and Expiration (Section 3.6),
2. **Administrative** which includes Definition of RAB (Part A), Basis and Authority for Charter (Part B), Board Officers and Meetings (Section 3.4), Effective Date and Amendments (Section 3.5), and Signature Block (Certification of RAB Approval), add Table of Contents, and
3. **Elections and Membership** which includes Qualifications, Applications, No Compensation, Attendance, Resignations, Public Input, and Terms (all appearing in Section 3.1).

(B) Completed Draft Revisions of Definition of RAB, Basis of Authority, and Mission Statement (see attached).

(C) Established Meeting Schedule for balance of March, 2002
March 11
March 19
March 25

All meetings will take place from 6:00PM to 8:00PM in
Conference Room #1 (AFBCA Offices)

(D) Identified remaining "Big Picture" items as focus of discussion for March 11 meeting.

March 5, 2002

Dr. Gene W. Lené
Community Co-Chair
Restoration Advisory Board
One Camino Santa Maria
San Antonio TX 78228

Dear RAB Member

Technical Review of the

Attached you will find a draft version of the *✓* Petitioned Public Health Assessment for Kelly Air Force Base conducted by the Agency for Toxic Substances and Disease Registry (ATSDR), prepared by Dr. Katherine Squibb under the Technical Assistance for Public Participation (TAPP) Grant Program. Please review the report and be prepared to discuss it at the Technical Review Subcommittee meeting scheduled for March 12, 2002.

In accordance with paragraph 3.2 of the TAPP contractor's Statement of Work for this contract, the contents of this report should not be discussed in any way with anyone outside of the Restoration Advisory Board prior to its release in final form.

Sincerely,

GENE W. LENÉ, Ph.D.
Community Co-Chair

DRAFT

Technical Review

of the

***Petitioned Public Health Assessment
Kelly Air Force Base (a/k/a East Kelly Air Force Base)
San Antonio, Bexar County, Texas
EPA Facility ID: TX2571724333***

Conducted by

Agency for Toxic Substances and Disease Registry (ATSDR)

**Released for Public Comment
June, 2001**

Prepared by

Katherine S. Squibb, PhD

**Division of Environmental Epidemiology and Toxicology
Department of Epidemiology and Preventive Medicine
University of Maryland, Baltimore
100 N. Greene Street
Baltimore, MD 21201**

**In accordance with
Technical Assistance for Public Participation (TAPP)
Contract F41622-98-A-5880**

February 26, 2002

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Background

People living near Kelly Air Force Base (Kelly AFB) in San Antonio, Texas, are concerned that chemical contamination at the base might be the cause of some of their health problems. This concern is being addressed by the Agency for Toxic Substances and Disease Registry (ATSDR) through a series of studies designed to determine whether residents near Kelly AFB are being exposed to chemicals at concentrations high enough to cause diseases.

Due to the complexity of the contamination at Kelly AFB, ATSDR has chosen to conduct their study in phases. Their Phase I Public Health Assessment document, which was released in 1999, examined twelve pathways by which people could be exposed to hazardous chemicals from Kelly AFB. They also examined health outcome data for the area (ATSDR, 1999). Additional information was needed at that time, however, to adequately assess the health impacts of contamination in the East Kelly communities, so a separate study was conducted to examine the health impacts of groundwater contamination and contamination specifically associated with East Kelly Air Force Base, a 400 acre area located just east of the main base. This annex was primarily used as a storage area, and release of chemicals to the environment occurred from leaking industrial waste pipe lines and leaking drums. According to 1990 census data, of the approximately 5,000 people that live within a 11 mile radius of East Kelly, 913 are children six years of age or younger, 1,300 are adults over the age of 65, and 900 are females of reproductive age. These groups represent populations that are often at greater risk when exposed to chemicals due to differences in their physiology and behavior (Landrigan et al., 1999).

ATSDR's health assessment report for East Kelly was released for public comment in June, 2001, and is the subject of this technical review. The specific chemical contamination evaluated in this report includes:

- Shallow groundwater volatile organic compounds (VOCs) that have moved off-site from the main base.
- Contaminants from leaking industrial waste pipe lines in the East Kelly annex (waste oils, solvents and paint thinners from engine repair facilities) present in groundwater and soil.
- Contaminants in soil from leaking drums of waste stored at Site SS009 in East Kelly which includes metals, dioxins and furans.

ATSDR conducts public health assessments of contaminated areas by identifying pathways by which people could possibly be exposed to chemicals at the site. The agency then determines whether exposure is occurring via these pathways and, if so, whether the exposure dose is high enough to cause health effects. The relationship between dose and health effects is based on dose response curves previously established for each chemical. The pathways of exposure to chemical contaminants addressed in this report were:

1. Ingestion of groundwater via the use of private wells in the shallow aquifer for drinking water and the inhalation of volatile organic compounds via the use of private well water for watering lawns and gardens
2. Ingestion of contaminated soil carried off base by either storm water run-off or the wind
3. Inhalation of volatile organic compounds present in shallow groundwater via the intrusion of soil gas into homes

Evaluation of Exposure Pathways: Summary and Comments

1. Use of private wells that draw from the contaminated shallow aquifer.

Private well surveys conducted since 1988 identified 22 private wells within a one mile radius of Kelly AFB. Chemical analysis of water drawn from 18 of these wells identified the presence of seven chemicals that exceeded maximum contaminant levels (MCLs) in at least one, and in some instances eight, of these wells. These chemicals included four volatile organic compounds (VOCs) (chloroform, dichloroethene, tetrachloroethene, and trichloroethene), a carcinogenic breakdown product of VOCs (vinyl chloride) and two metals (lead and thallium). Based on these results, residents were advised not to use water from these wells for drinking water, showering or cooking. There was no restriction placed on use for gardening or lawn care. Although specific data were not presented in the report, ATSDR reported that the one private well that had been used for drinking water did not pose a health hazard, since chemicals present in the water from this well were below those expected to cause health effects in people consuming the water.

Comments

One issue that needs more clarification is whether water from shallow groundwater wells can be safely used for purposes other than drinking water, such as washing cars and watering lawns and gardens. ATSDR reported that calculations of risk based on exposure from showering with the water indicated an absence of expected health effects, however, it's not clear from this report whether additive effects from all of the VOCs present in the shallow groundwater were accounted for in these risk calculations. This should have included not only the cis-1,2-dichloroethene (DCE), tetrachloroethene (PCE), trichloroethene (TCE) and chloroform, but also the benzene, ethylbenzene, chlorobenzene, toluene, xylenes, styrene and hexachlorobutadiene which are known to be present in the shallow groundwater aquifer from which these wells draw and may have been present in the sampled wells at concentrations below comparison values.

The presence of lead and thallium above their respective maximum contaminant level (MCL) concentrations also needs to be considered in calculations of risk from using water from these wells for watering gardens. Unlike VOCs, these metal contaminants do not volatilize and disperse when water is used for irrigation. Instead, they bind to and accumulate in soils and can be taken up by plants (EPA, 1986; Kemper and Bertram, 1991). Thus, exposure to lead and thallium can occur by ingesting food from gardens or by inhaling soil dispersed from garden areas. Ingestion of soil by young children would also be an exposure route of concern.

2. Ingestion of contaminated surface soil migrating off base

A second potential pathway by which residents living near East Kelly AFB could be exposed to hazardous chemicals from the base is by direct contact with contaminated soil that has moved from the base into the community by storm water runoff or from dispersion by the wind. ATSDR reported that arsenic contaminated soil from a storage area in East Kelly (SS09 Site -7) had been removed, and therefore is no longer of concern. They did, however, investigate the potential health risks of surface soil in other areas of East Kelly that contain polycyclic aromatic hydrocarbons (PAHs). According to the ATSDR report, incidental ingestion of this soil is unlikely to cause health effects

Comments

◆ PAH contaminated soil

ATSDR's conclusion that the PAH contaminated soil does not present a likely health hazard is based on an analysis of the four PAH compounds individually, each of which resulted in an estimated risk of less than 1 in 10,000 (10^{-4}). However, since exposure would occur to all four of these carcinogenic compounds at the same time, the estimated risks should be added to obtain an overall risk estimate. In this case, an overall risk of 1.2×10^{-4} is obtained, which according to ATSDR's categories, is a "low increased risk."

Even this calculated risk is a minimum risk, since exposure can also occur from inhalation of the soil. It is unclear from ATSDR's report why only the ingestion pathway was investigated. Inhalation of dust containing PAH contaminated soil should also have been considered, or a clear explanation of why this pathway was ruled out should have been provided. If PAHs are bound to particles that remain resident in the lungs for extended periods of time, their potential for causing lung cancer would be enhanced.

◆ Stormwater Runoff

ATSDR's calculations of health risks from exposure to soil from East Kelly in this report are based on current concentrations of metals, dibenzodioxins,

dibenzofurans and PAHs in soils in East Kelly. Prior to remediation of IRP Site SS009 (a former storage area), however, the soil at this site was contaminated with dioxins, furans and metals at concentrations exceeding background levels. It does not appear that ATSDR has considered health risks associated with soil that migrated from this site prior to remediation. According to the IRP closure report for Site SS009 (Kelly Air Force Base, 1997), surface water drainage from this site occurs via storm sewer drains that cross the storage yard. Storm drainage for East Kelly AFB is discharged to Six Mile Creek through National Pollutant Discharge Elimination System NPDES Outfall 004. It is recommended that contamination at the mouth of this outfall should be characterized, particularly if this area of the creek is accessible to and/or frequented by the public. Contaminants in surface water draining from Site 009 prior to remediation could have built up in the creek bed in past years. Even current run off from the site could be of concern, since this site was only cleaned up to meet industrial health criteria.

3. Infiltration of VOCs into homes from shallow groundwater plumes

ATSDR estimated the indoor air concentrations of fifteen chemical contaminants present in surface groundwater in the East Kelly area based on soil gas monitoring data provided by Kelly AFB (*Informal Technical Information Report Zone 4 OU-2 and Site S-4 Vapor Monitoring*, March 2000). Estimates were made using EPA's Johnson & Ettinger model designed specifically for this purpose (EPA, 1997) and soil gas data obtained at the end of February, 2000, from eight soil gas monitoring wells installed south west to south east of the East Kelly base annex. Based on this determination, ATSDR concluded that concentrations of the chemicals to which residents could be exposed in their homes were not high enough to cause adverse health effects. Estimated cancer risk ranged from 1.08×10^{-8} (1.08 in 100 million) for benzene to 1.34×10^{-6} (1.34 in a million) for tetrachloroethene (PCE).

Comments

The risk analysis performed by ATSDR in this study indicates that VOCs in groundwater do not pose an urgent health hazard to residents living near East Kelly, however, further work is needed to accurately characterize low level risks from this route of exposure due to limitations in this analysis. These limitations include: 1) uncertainties in the prediction of indoor air concentrations using the Johnson and Ettinger model, 2) the inability to assess the risk of cancer from 1,1, DCE due to the absence of data, 3) the lack of an assessment of the non-carcinogenic effects of the chemicals of concern, and 4) the limited number of the soil gas monitoring wells.

◆ Validity of the Johnson and Ettinger Model

Models can be very useful tools for providing estimates of health effects of chemicals when data are not available and for guiding the development of better monitoring programs, however it is important to recognized that models have their limitations and must be applied carefully to different situations. There are a number of factors that

could significantly alter the indoor air concentrations that were predicted by the Johnson and Ettinger model in this study.

One very important determinant of how well a model predicts reality is whether the data used to run the model are accurate. In this study, single soil gas measurements from each well were used to predict indoor air concentrations. The uncertainty surrounding the accuracy of this single measurement at each well is high. Contaminant concentrations can vary significantly in groundwater (and soil gas) depending upon fluctuations in the water table due to rainfall events. Use of an average soil gas concentration, determined from multiple sampling events from the same well over a period of a year (four seasons), would have greatly strengthened this study.

Another difficulty with ATSDR's analysis is that there is evidence that the Johnson and Ettinger model is not well suited for predicting the concentrations of chlorinated volatile organic compounds in indoor air from soil gas vapor intrusion and tends to under predict concentrations of these chemicals (Fitzpatrick and Fitzgerald, 1996). Many of the chemicals of concern in the groundwater plume under East Kelly are chlorinated VOCs.

The input parameters used when applying a model to a specific site are also very important in determining the accuracy of the predicted outcomes of the model. In the Johnson and Ettinger model, some of the most critical parameters include the total porosity of the soil, the water-filled porosity, the soil vapor permeability, the soil-building pressure differential, and the depth to groundwater (Kelly Air Force Base, 2000). ATSDR provided no explanation of which parameters they used to obtain the predicted indoor concentrations presented in their assessment. These should be provided in their report. However, if the same parameters were chosen as those used in the Kelly soil vapor monitoring report (Kelly Air Force Base, 2000), then the predicted indoor air concentrations used in the health risk assessments were not overly conservative. For instance, the depth to groundwater in the East Kelly area ranges from 10-30 ft; a 15 ft depth was selected for use in the model. A decrease in the depth parameter to 10 ft would have increased predicted indoor air concentrations of vinyl chloride by 7%. An increase in total soil porosity from 0.3 to 0.4 would have increased predicted concentrations by 85% (Kelly Air Force Base, 2000). Such changes in selected parameters would have significant, cumulative effects on the final outcomes of the model.

Building parameters are also important in determining the build up of soil gas in a home. EPA's parameters for an "average" residence in the U.S describe a two-story residence with 8 ft ceiling heights with each floor being 1000 square ft. In many cases, this "average residence" is much bigger than those present in the East Kelly area. Thus, soil gas entering the homes would not disperse throughout as large an area, which would again result in higher concentrations than those predicted by the model. Other building parameters of importance include the pressure differential and air exchange rates within a home.

In order to improve the results of this modeling study, site specific input parameters are needed. Once these have been established, the customized model for the East Kelly area should then be validated by measuring indoor air concentrations in homes near the soil gas monitoring wells. If predicted concentrations match those directly measured, then this validated model will be very useful for monitoring the intrusion of soil gas into homes in the future.

◆ **Absence of carcinogenicity data for cis 1,2-dichloroethene (DCE)**

There is uncertainty in the health effects evaluated by ATSDR in this report. Maximum soil gas concentrations measured for cis 1,2 dichloroethene (DCE) were almost 10 times EPA's Risk Based Concentration (RBC) criteria for this chemical, and yet ATSDR was not able to calculate an estimated cancer risk for this chemical due to an absence of data. This unknown health effect was not mentioned further in the report. ATSDR should have recommended a need for further investigation of the potential health effects of this chemical.

◆ **Absence of assessment of non-carcinogenic health effects**

Health effects may also have been under estimated in this study because the only health endpoint evaluated by ATSDR for the 15 chemicals present in soil gas was cancer. There was no apparent attempt to assess non-carcinogenic effects, such as reproductive, developmental, immunological and neurological alterations. Evidence from epidemiological studies in humans indicates that chronic exposure to tetrachloroethene can cause memory and concentration impairment and alterations in reaction times (ATSDR, 1997). EPA has not developed an inhalation reference concentration (RfC) for tetrachloroethene, however, acceptable ambient air concentrations have been set by different state agencies for chronic (1 year) exposures. The guideline in Texas for tetrachlorethene is 34 ug/m^3 , however other states have established guideline levels as low as 0.01 ug/m^3 (ATSDR, 1997). The predicted indoor air concentration for tetrachloroethene in homes near Ease Kelly was 0.23 ug/m^3 , which is above the lower guideline values. Because our understanding of the health effects of chronic exposures to low concentrations of VOCs such as tetrachlorethene is limited, especially in young children and the elderly, it would be wise to limit exposure to such chemicals as much as possible. This uncertainty also increases the importance of directly measuring indoor air concentrations of tetrachloroethene to validate the modeled values.

◆ **Siting of Wells**

According to a meeting summary included in the Kelly AFB soil vapor monitoring report (Kelly Air Force Base, 2000), the locations of the eight soil gas monitoring wells were selected based on the location of the "vinyl chloride plume and not the 1,1 DCE plume." This raises the question as to whether data from the eight monitoring wells are representative of soil gas concentrations throughout the East Kelly residential area. Groundwater contamination data should be consulted to determine where additional soil gas monitoring wells should be installed to be sure maximum

concentrations of all chemicals of concern have been captured, particularly for the chemical tetrachloroethene (PCE), which is a major contaminant in the shallow groundwater in the entire East Kelly area.

Continued monitoring of the present wells, as well as additional wells, is also needed to verify the low concentrations of vinyl chloride measured in the soil gas samples. It is not clear why vinyl chloride concentrations in groundwater samples from wells adjacent to the soil gas wells were below detection limits during the sampling that took place in 2000, when this chemical had been detected in these wells when they were sampled in 1999. Reported concentrations had been as high as 10 ppb. This is particularly strange since these well sites were chosen to target the vinyl chloride plume. Since vinyl chloride is a breakdown product of TCE and PCE when these chemicals degrade in the environment, it is very important to continue both groundwater and soil gas monitoring for this potent liver carcinogen.

Child Health Initiative

As part of this public health assessment, ATSDR reviewed possible exposure situations in which children might be at greater risk of health effects than adults and concluded that there were no apparent health concerns for children based on available sampling and modeling data.

Comment

As described in this report, children are likely to be more sensitive than adults to certain kinds of chemical exposures due to their smaller size and the fact that they are undergoing rapid growth and development. In addition to these factors, children also have more time to develop chronic diseases when chronic exposure to chemicals begins at an early age. Diseases such as cancer and neurodegenerative diseases develop over extended periods of time; thus chemical insults sustained early in life have a greater chance of developing into symptomatic diseases (Landrigan et al., 1999).

Of particular relevance to the exposure pathways of concern in this health assessment is the fact that infants breathe more air than adults per pound of body weight. Thus young children living in homes in the East Kelly area would be exposed to twice the dose of the chemicals present in indoor air (Landrigan et al., 1999). This needs to be taken into account as this exposure pathway continues to be monitored for both carcinogenic and neurological effects.

Summary and Recommendations

This health assessment document prepared by ATSDR for the East Kelly area is a good, first cut analysis of the risks associated with exposure to chemicals from Kelly AFB. Carcinogenic risks are low and exposures do not constitute an urgent health

hazard, however further work is needed to verify the modeling results upon which the conclusions are based for the soil gas exposure pathway and also to characterize the risk of possible non-carcinogenic health effects. Other limitations, primarily the need for additional data, also need to be addressed. The following recommendations are presented for consideration:

◆ **Exposure to soil from East Kelly**

1. Sample Six Mile Creek sediments at Outfall 004 for metals, dibenzodioxins and dibenzofurans that may have migrated from Site SS009 through surface runoff.

◆ **Exposure to VOCs in groundwater via intrusion into area homes**

2. Collect additional soil gas measurements at three month intervals to determine the range of seasonal variability in these results.
3. Install additional soil gas monitoring wells in other areas around East Kelly to insure that maximum concentrations of all of the chemicals of concern in the groundwater plume(s) have been captured.
4. Refine the Johnson and Ettinger model using more site specific parameters.
5. Validate the Johnson and Ettinger model as it has been applied to the East Kelly area by collecting indoor air samples from homes near the soil gas monitoring wells.
6. Once validated, use the model to monitor indoor air concentrations based on yearly monitoring data for groundwater and/or soil gas concentrations for chemicals of concern, in particular vinyl chloride.
7. Consider non-carcinogenic effects of chronic exposure to the chemicals of concern in indoor air, especially neurological effects in young children as well as adults.

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Technical Review Report

**ATSDR
Petitioned Public Health Assessment
Kelly Air Force Base
(a/k/a East Kelly Air Force Base)
San Antonio, Bexar County, Texas**

**Katherine S. Squibb, PhD
Program in Toxicology
University of Maryland, Baltimore**

March 12, 2002

East Kelly Air Force Base

- **400 acre area located east of the main base**
- **Used primarily as a storage area**
- **Release of chemicals into the environment occurred from:**
 - ▶ **Leaking industrial waste pipelines**
 - ▶ **Leaking drums**

Chemicals of Concern

- **Shallow groundwater contaminants**
 - **Volatile organic compounds (VOCs)**
 - **Metals**

- **Contaminants in soil**
 - **Polycyclic aromatic hydrocarbons (PAHs)**
 - **Metals**
 - **Dibenzodioxans and dibenzofurans**

ATSDR Approach

- **Exposure Pathways**

Are/have people been exposed to hazardous chemicals?

If so, were they exposed to enough to make them sick?

- **Health Outcome Data**

Is there evidence from local health data that diseases known to be caused by chemicals are present in higher than expected rates?

Exposure Pathways in East Kelly Public Health Assessment Study

- **Exposure to VOCs and metals present in shallow aquifer via**
 - Use of private wells for drinking water**
 - Use of private wells for irrigation of lawns and gardens**
- **Exposure to PAHs in surface soil migrating off base from the East Kelly area**
- **Exposure to VOCs in shallow aquifer by intrusion and accumulation of soil gas in homes**

ATSDR Health Hazard Categories

| Category | Definition |
|---|---|
| Urgent public health hazard | Short term exposures (<1 yr) that could result in adverse health effects |
| Public health hazard | Long term exposures (> 1 yr) that could result in adverse health effects |
| Indeterminant public health hazard | Level of health hazard cannot be determined because critical information is not available |
| → No apparent public health hazard | Past, present or future exposures may occur but exposures are not expected to cause adverse health effects |
| No public health hazard | No evidence of past, present or future exposures, so no adverse health effects are expected |

ATSDR Cancer Risk Categories

| Category | Fraction | Exponential |
|-----------------------------------|-------------------------------|----------------------------------|
| No increased risk | Less than 1 in 100,000 | $< 10^{-5}$ |
| No apparent increased risk | 1 in 100,000 | 10^{-5} |
| Low increased risk | 1 in 10,000 | 10^{-4} |
| Moderate increased risk | 1 in 1,000 | 10^{-3} |
| High increased risk | 1 in 100 | 10^{-2} |
| Very high increased risk | Greater than 1 in 10 | $> 10^{-2}$ |

Use of Private Wells in Shallow Aquifer

18 private wells tested for VOCs, semi-VOCs, metals and cyanide

Concentrations of five VOCs and two metals were above risk based comparison values (RBCs) for drinking water

- **cis-1,2-Dichloroethene (DCE)**
- **Tetrachloroethene (PCE)**
- **Trichloroethene (TCE)**
- **Chloroform**
- **Vinyl chloride**
- **Lead**
- **Thallium**

Use of Private Wells in Shallow Aquifer

ATSDR Conclusion:

Residents advised not to use private wells for drinking, showering or cooking.

OK to use for irrigating lawns and gardens

Comments:

Need to consider build up of metals in soil in irrigated areas, especially gardens

Need to consider additive effects of all VOCs present in groundwater, including those present at concentrations below RBCs, such as benzene and styrene

Ingestion of Soil Migrating Off Base

ATSDR Conclusions

- **Cancer risk associated with ingestion of soil containing PAHs less than 1 in 10,000, so health effects are unlikely**

Comments

- **Additive risk from ingestion of PAHs is greater than 10^{-4} which represents a “low increased risk”**
- **Investigation did not consider risk associated with inhalation of contaminated soil**

Ingestion of Soil Migrating Off Base

ATSDR Conclusion

- **Arsenic contaminated soil in Site SS009 area no longer of concern due to clean-up action in 1997**

Comment

- **Surface water drainage from Site SS009 prior to cleanup could have carried contaminated soil into Six Mile Creek at outfall 004. This area needs to be tested for arsenic, dibenzodioxins and dibenzofurans**

Infiltration of VOCs into homes

ATSDR Conclusions

- **Estimates of indoor air concentrations from EPA model using soil gas data from 8 sites suggest there are no health risks from this exposure pathway**

Modeling Approach

Johnson & Ettinger Model was used to estimate indoor air concentrations from given soil gas concentrations of chemicals of concern

Six chemicals present in soil gas gave predicted indoor air concentrations that exceeded EPA's RBC values:

- **cis-1,2-Dichloroethene (DCE)**
- **Benzene**
- **Methylene Chloride**
- **Tetrachlorethylene (PCE)** **1.34×10^{-6} cancer risk**
- **Trichloroethene (TCE)**
- **Hexachlorobutadiene**

Infiltration of VOCs into homes

Comments

- **Accuracy of the model's predictions needs to be determined.**
 - ⇒ **Need quarterly soil gas sampling for representative sample**
 - ⇒ **Need to adapt the model for use with VOCs**
 - ⇒ **Need to run the model with site specific parameters, (appropriate home size, air exchange rates, soil porosity, etc.)**

- **Need to validate the model with results from indoor air monitoring**

Infiltration of VOCs into homes

Comments

- **Carcinogenic risk from VOC exposures does not include risk from exposure to cis-1,2-dichlorethene due to the “absence of data.”**
- **Carcinogenicity of DCE needs further evaluation to decrease the uncertainty of the risk calculations**
- **Additive risks from other chemicals also need to be considered**

Infiltration of VOCs into homes

Comments:

- **Only carcinogenic effects of chemicals in soil gas were considered.**
- **Target organ effects also should have been calculated, including effects on reproduction, the immune system and the nervous system.**
- **Predicted indoor air concentration of tetrachlorethene exceeds ambient air concentration guideline values set by some states. EPA has yet to set an inhalation reference concentration.**

Infiltration of VOCs into homes

Comments

- **Absence of vinyl chloride in soil gas monitoring wells needs to be verified by further monitoring.**
- **Presence of this potent carcinogen would significantly increase health risk calculations.**
- **Long-term monitoring for vinyl chloride is recommended since vinyl chloride is a natural degradation product of the VOCs present in the shallow groundwater.**

Infiltration of VOCs into homes

Comments:

- **Additional soil gas monitoring wells may be needed to adequately capture maximum concentrations of all groundwater contaminants**
- **Evidence suggests that only the vinyl chloride plume was targeted**

Infiltration of VOCs into homes

Comments

- **Air monitoring in homes is needed to validate the predictions of the EPA model used in this risk assessment.**
- **Once validated, the model can be used with greater confidence as a monitoring tool.**

Summary

Further information is needed to assure that contamination associated with East Kelly Air Force Base is not likely to cause adverse health effects.

- **Concentrations of lead and thallium in soils irrigated with water from the shallow aquifer should be tested**
- **Risk calculations for PAH contaminated soil should include inhalation exposures**
- **Sediments at outfall 004 in Six Mile Creek need to be tested for arsenic, dibenzodioxins and dibenzofurans**

Summary (continued)

Risk calculations for inhalation of VOCs in soil gas in homes need to be improved by:

- **Collecting additional soil gas measurements to provide more representative data**
- **Refining the EPA model using more site specific parameters**
- **Validating the site specific model by collecting indoor air samples**
- **Considering the non-carcinogenic effects of chronic exposure to VOCs, especially in young children**

FINAL PAGE

ADMINISTRATIVE RECORD

FINAL PAGE