TRAVIS AIR FORCE BASE

ENVIRONMENTAL RESTORATION PROGRAM

PUBLIC MEETING

PROPOSED PLAN FOR GROUNDWATER CLEANUP

FINAL, OCTOBER 2012

NORTHERN SOLANO COUNTY ASSOCIATION OF REALTORS

3690 HILBORN ROAD

FAIRFIELD, CALIFORNIA

THURSDAY, OCTOBER 18, 2012

7:00 P.M.

Reported by:
Richard A. Friant

ACCELERATED BUSINESS GROUP

(916) 851-5976

A P P E A R A N C E S

Travis Air Force Base

Mark Smith, Restoration Program Manager, 60 CES/CEANR

Glenn Anderson, Project Manager, 60 CES/CEANR

Lonnie Duke, Project Manager, 60 CES/CEANR

Gregory Parrott, Attorney Advisor, 60 AMW/JA

Brian Sassaman, Environmental Chief, 60 CES/CEANR

Merrie Schilter-Lowe, Public Affair, 60 AMW/PA

Regulators Present

Jose Salcedo, Project Manager
Dawn Wright, Public Participation Specialist
Department of Toxic Substances Control

Adriana Constantinescu
San Francisco Bay Regional Water Quality Control Board

Nadia Hollan Burke, Project Manager
United States Environmental Protection Agency

Restoration Advisory Board Members

Lt. Col. Dan A. Guinan, Air Force Co-Chair

David Marianno, Community Co-Chair

John Foster, RAB Member

Mike Reagan, Supervisor District 5
Solano County Board of Supervisors

Contractors

Alison Jones, Vice President
Arcadis

Mike Wray
Jeannette Cumberland
CH2M HILL

Clare Gilmore, Project Manager
Rachel Hess, Project Manager
Joe Yeasted, Senior Program Manager
ITSI Gilbane

Mary Snow
Techlaw Inc.

John Clark, Senior Engineer
URS Corporation

Also Present

Jack Batson

Bill Cumberland

I N D E X

P R O C E E D I N G S

7:02 p.m.

RESTORATION PROGRAM MANAGER SMITH: Well good evening and welcome. I'm Mark Smith, the environmental restoration, or cleanup, program manager for Travis Air Force Base.

If you haven't already done so, please sign in. The sign-in sheet is in the back by the door where you entered. Refreshments are on the back table. I see most people have found them, that's good. Coffee and tea are on the counter over to the side; please help yourself.

If there should be an emergency for any reason, you can exit through the door that you came in. Or over on your left there's a couple of doors that take you into a hallway; there's an exit door on the end of the hallway. Restrooms are also through those doors on that side.

So I'd like to talk about three items this evening. The first is we will discuss the Travis Air Force Base preferred alternatives for cleanup of contaminated groundwater and seek your input.

Second you will see various interim groundwater cleanup activities we have conducted as we prepared for our final groundwater cleanup.

And third you will also see the Air Force preferred alternatives that we hope will become part of our

final groundwater cleanup program.

I am now calling this public meeting to order. This meeting should adjourn no later than 8:30 p.m.

This is a public meeting that Travis Air Force Base is holding because we are proposing preferred alternatives for 19 contaminated groundwater locations. This meeting is part of the 30-day public comment period running from October 10th, 2012, through November 9th, 2012. I welcome your questions, your comments and your involvement as we move forward with the Travis cleanup program.

Tonight's meeting is being recorded for the purpose of an official transcript. So if you don't feel comfortable speaking in public, feel free to write down any comments or questions that you have as we go through tonight's meeting. You can hand them to Mr. Wray on my right here or to myself. Formal comments can be given to us tonight by writing your comments on the comment forms provided or you can email Ms. Merrie Schilter-Lowe at the Public Affairs Office. If you have additional comments after tonight you can submit your comments to us as long as they are postmarked by November 9th.

Tonight's meeting and the public comment period provide you with an opportunity to ask questions, provide comments and help shape the direction the Travis Air Force

Base cleanup program will take.

Mr. Glenn Anderson, a project manager and part of the Travis Environmental Restoration Program staff, will provide more detail on all the steps and phases involved in addressing the problem of contamination, all while protecting people and the environment and ultimately cleaning up the contamination.

Mr. Lonnie Duke, also a project manager and part of the Travis Environmental Restoration Program staff, will describe in more detail our preferred remedies to clean up our groundwater contamination at the 19 groundwater sites.

The proposed plan provides what we, the Air Force, believe are the best approaches to groundwater cleanup. Each preferred approach or preferred remedy has been discussed and developed with the state and federal regulatory agencies: the Water Board, the Department of Toxic Substances Control or DTSC, and the Environmental Protection Agency or EPA.

The regulatory agencies have not concurred with our preferred remedies yet and won't do so until we have public input. Once we have the public input, we can begin to develop a final Record of Decision for the groundwater cleanup.

Any speaker or presenter should leave the audience with a key message to take home. I have two tonight that I

would like you to take back with you. The first is that people and animals are not at risk from the contamination in the groundwater beneath Travis Air Force Base. The Travis groundwater is not used for drinking, bathing or cooking.

The second is that the Air Force preferred remedies are being proposed to you; they are not final. Please take this opportunity to provide us with your input.

All public input provided will be documented in a responsiveness summary in the Record of Decision, and the preferred remedies will be selected at that time.

I want you to know that we have advertised in the local newspapers, our own newsletter and the Travis public website to get the word out to everyone that this proposed plan is available for public review and comment.

This is the proposed plan; it looks like this. There's extra copies in the back, hard copies in the back. You may have downloaded a copy of this already from the Travis Environmental website that was advertised in the local newspaper, the Vacaville Reporter for one. We have also advertised it in the Guardian, which is this; it's our newsletter. This describes what's in the proposed plan to some extent. It's kind of a guide to help you through it. But if you prefer hard copies we have them both in the back.

At this time I'd like to ask Mr. Glenn Anderson to come up and discuss our interim groundwater cleanup

activities with you.

PROJECT MANAGER ANDERSON: Thanks, Mark. Well as Mark stated, I'll cover the interim groundwater cleanup actions that are taking place today. That means that this is not the first time that we have presented our ideas for groundwater cleanup to the public for comment. We have asked for public comment twice in the past to start the cleanup of contaminated groundwater, first on the east side of the base and then on the west side.

So for the third time we are asking for public comment. But this time we want to change our current strategy for the whole base and transition to a new set of cleanup technologies. Before we can determine whether it is a good idea to use these technologies, it is important to know what our current strategy is and why we believe that a change in strategy is in the best interest of the environment and the Air Force.

First I want to show you the basic process that we use to make cleanup decisions. I am calling it the Superfund Process because most people recognize the term "Superfund" as the law that deals with contamination. The official name of this law is the Comprehensive Environmental Response, Compensation and Liability Act of 1980 and its acronym is CERCLA.

These are the steps to identify places where

contamination might be found; to investigate those places and determine if discovered contamination requires some sort of an action, to determine the best technologies to deal with the contamination. That's the feasibility study; to present those technologies to the public for review. That's what we're doing today (proposed plan); to document those cleanup decisions in a legally binding document. And Mark already mentioned that's the Record of Decision.

This cleanup time line shows how we apply the Superfund process to our contaminated groundwater. In the 1980s the base realized that industrial activities generated contamination and began to study the problem through the 1990s.

Toward the end of the last century initial cleanup options were compared and appropriate cleanup options were selected. We have spent the last dozen years in an interim cleanup program and now we are taking a second look at new technologies and going through the process again to eventually select final cleanup technologies.

In the 1990s there were not a whole lot of proven groundwater cleanup strategies to choose from that would definitely work beneath the base. The standard approach was called groundwater extraction and treatment, or pump and treat, and the EPA referred to it as a presumptive remedy. This is because it did not require a lot of field work to

obtain regulatory acceptance, so it ensured a consistent approach to address groundwater issues. It was expected to be used except under unusual circumstances, and Travis didn't have any unusual circumstances, so most of our interim groundwater actions involved pump and treat.

Also in the 1990s the Environmental Protection Agency and the Department of Defense looked into the possibility that natural processes could contribute to the cleanup of a site. The term "natural attenuation" refers to the naturally-occurring physical, chemical or biological processes that act without human intervention to reduce the mass, toxicity, mobility, volume or concentration of contaminants in the soil or groundwater.

To determine whether these processes were actually taking place at Travis Air Force Base, we added a few groundwater analyses to our annual groundwater sampling program to support a monitored natural attenuation assessment.

We had two expectations for these pump and treat systems. First, we wanted them to remove as much contaminant mass out of the ground as possible. To achieve this, extraction wells are placed in areas where you have the highest concentrations.

Also we wanted to stop groundwater contaminants from moving into clean areas. So extraction wells were

placed around a plume so that the contaminants can't move beyond the wells.

And I put together a collage to show some of the treatment systems that we have on base. Starting in the upper left hand corner and going clockwise, first we have a photograph of the Central Groundwater Treatment Plant. This is a photo that was taken during the time when we were pumping activated carbon into two 20,000 pound canisters that are used to treat groundwater. Contaminated groundwater enters the top and it comes out clean at the bottom.

Moving along to the upper right corner. That's a construction photograph of the West Treatment and Transfer Plant. At this facility contaminated gases or vapor are treated and contaminated groundwater is transferred to the Central Plant that I mentioned earlier.

And then the last two photographs. The bottom right is our North Treatment Plant and the bottom left is our South Treatment Plant. So a total of four large treatment facilities.

Overall the interim cleanup strategy proved to be very successful. The well network for all groundwater sites extracted over 1.3 billion gallons of contaminated groundwater; and that's billion with a B. And the four treatment systems removed almost 12,000 pounds of

contaminants from that water. Also we achieved the interim cleanup goals for one pesticide site, so it's ready to be closed.

Also I mentioned earlier that we were collecting additional groundwater data to demonstrate whether natural attenuation processes in the subsurface can contribute to the groundwater cleanup. After over ten years of monitoring it is clear that natural processes are capable of stabilizing plumes and reducing contaminant concentrations.

I am now going to show you a series of figures of the base. The first figure shows sort of like the starting point of before we actually began active interim cleanup. This shows the plumes, the extent of the plumes across the base. So this is the starting point. This is what it looked like back in 2001, in 2003, and on throughout that decade. And as you can see the extent of the plumes have been shrinking during that interim period. Let me just go back. I just like to do this. If you go real fast you can kind of see that it shrinks pretty quickly, okay. So you start off with big blobs and they're shrinking to small blobs.

But there is more to the story than that. Not only are we shrinking the plumes but the concentrations are dropping. These two figures show the contaminant concentrations at a groundwater site in the northeast corner

of the base shown right here. The dark pink represents contaminant concentration over 1,000 ppb, the light pink represents concentrations between 100 and 1,000 ppb and the yellow represents concentrations between 6 and 100 ppb. As you can see, not only are -- not only are the individual portions of the plume smaller but it also has much lower concentrations.

Now that was a small plume, a very small location of the base. This is another example of the success of our pump and treat strategy. This is our largest and most contaminated plume on the base. And to make the cleanup more challenging, it's located between aircraft parking areas, taxiways and runways so access to large portions of the plume are very restricted. However, after over ten years of interim cleanup, the plume is smaller in size and the contaminant concentrations are lower. These are trends that we see at most of our sites.

So that's the good news. Unfortunately, our interim approach offers some serious challenges. First, over time the groundwater extraction and treatment strategy becomes less efficient. There are two reasons for this. First, the concentrations of the residual contaminants are lower so less contaminant is removed for each gallon of groundwater extracted. We often illustrate this using the soap and the sponge analogy. And I tend to use props

whenever possible so this is my analogy.

This is a sponge. Imagine the sponge is like your medium that requires cleanup and this is the contaminant, the liquid soap. So if you accidently leaked soap onto the sponge I have to now figure out how do I clean it up. Now imagine that I have some fresh water and that I can fill the sponge up with water and then squeeze it. And every time I squeeze a certain amount of soap comes out. The first squeeze a whole lot comes out and I've made a lot of progress. The second time not quite as much, the third time, the fourth time, the amount tends to drop with every squeeze.

Now imagine each squeeze represents $100,000 of activity. Using that analogy, you can see that over time my effort that I am putting into it becomes less efficient. I am not getting as much for every amount of water that I am putting into the sponge. After about the 20th time the water actually may look like it's clean but when you taste it you are going to realize there's still some soap left over. So we're not -- in other words we are not getting to the cleanup goal, which is a clean sponge.

Another reason for the drop in efficiency is where the residual contaminants are located. Pump and treat systems are very effective when the extraction wells are placed in gravel and sand layers. That's because it's

easier for water to flush through them. This is not true for silt and clay layers, these layers are tight and water does not flow through them very well.

So after years of pump and treat operation the water in the sandy soil is really clean but the clay layers hold most of the residual contaminants. Since it takes a long time for the contaminants to travel by diffusion from the clay layers into the sandy layers, it is more difficult to reach the selected cleanup levels.

On top of all of that, the treatment plants are manmade and require maintenance, and the amount of maintenance increases over time.

And finally, these systems use a lot of electricity, and the Air Force is looking into ways to reduce its electrical consumption as a cost and resource-saving measure.

During the interim period several questions came up that added to the challenge. First, were vapors from dissolved contaminants getting into buildings? Vapor intrusion is a term used to describe this and the breathing of contaminated vapors can create a human health problem.

Another question is whether we can demonstrate how natural attenuation is working on Travis Air Force Base. We know that it's happening because many plumes or portions of the plumes are not moving and their concentrations are

dropping, even though we are not actively cleaning them. But could we actually identify the natural processes that are attenuating these plumes? That's the question.

And finally, and the biggest one, are there any new technologies available and will they work under the conditions found at Travis Air Force Base?

So to answer the first question concerning vapor intrusion, we conducted an assessment of the buildings with office spaces that lie above contaminant plumes. We learned that any vapors from these plumes are not able to get though our clay-rich soil and enter the foundations of our office buildings. So that is good news because we don't have to install any engineered remedies in existing buildings to prevent vapor intrusion.

Concerning natural attenuation. We conducted several studies to identify the processes that make natural attenuation work. The most impressive study involved highly technical laboratory procedures that have been recently developed to measure the activity of microscopic organisms that can contribute to the breakdown of contaminants. These procedures target the genes of microbes, looking for their DNA, and the enzymes that they produce; the enzymes that actually could break down contaminants in an oxygen-rich environment. The study concluded that there was a biological component to the natural attenuation observed on

the base.

The last question involved new technologies that have been developed during the interim period and whether they might work at Travis Air Force Base. The simple answer is that a number of new cleanup technologies are now available and the Air Force Center for Engineering and the Environment has funded several demonstration projects on Travis and other Air Force facilities to see if they work under real world conditions.

Thanks to the success of these demonstration projects we designed groundwater cleanup remedies that already have a proven track record on the base. This gives a high level of confidence that the Air Force-proposed remedies will clean up the residual groundwater contaminants and achieve all established cleanup levels.

At this point I would like to turn over the presentation to Mr. Lonnie Duke who will describe the demonstration projects that I just mentioned and present the Air Force-proposed remedies.

PROJECT MANAGER DUKE: Thank you, Glenn, and good evening, everyone. Glenn has just told you about how we got to where we are today and now I'm going to talk a little bit about where we are going.

The next step is the proposed plan that we are presenting tonight that provides the details of what

remedies the Air Force believes are the most appropriate to clean up the contaminated groundwater under the base.

These remedies are just proposed at this time and we would like your input to help us determine if these remedies are indeed the best way to proceed or if there is something else that was not considered that may get the sites cleaned up faster, safer or in a more cost-effective manner.

Glenn mentioned the technology demonstration projects and here is a list of them that we looked at during the interim period. And most of these were actually deployed on Travis in actual conditions to determine if they would work. And also in 2008 while we were doing this, green sustainable remediation, or GSR techniques, were being discussed and developed.

So what is green sustainable remediation or GSR? That's the practice of considering all of the effects of a remedy, such as the amount of energy used and the resulting greenhouse gas emissions created by that energy that is used while operating a remediation system.

The Travis program was the first in the Air Force to really adopt these GSR techniques. Several different GSR techniques were tried out during the interim period and proved to be useful for the remediation program so they have been incorporated into the Air Force-proposed remedies for

cleanup of the groundwater.

And here is one of the first GSR techniques used on the base. It was a solar-powered pump to run an extraction well. And this is actually an extraction well with a solar panel and a battery and it runs the pumps and it was very successful.

The reason we did this here is this happens to be a real nice vernal pool out here and we weren't able to bring any power out there; we couldn't trench. So we tried the electric -- the solar electricity generation and it worked great. The pumps proved to work very well and they required very little maintenance. They also proved to be very capable of pumping water long distances for treatment without using any electricity from the grid and therefore not creating any additional greenhouse gas emissions.

Now the solar extraction wells worked so well it was decided to use a solar-powered extraction well for a different demonstration project, a solar-powered bioreactor. A bioreactor is essentially a big hole in the ground back-filled with mulch. You can think of a bioreactor as a coffee percolator with the mulch acting as the coffee grounds.

The solar-powered pump brings contaminated groundwater into the bioreactor where it percolates through the mulch, down through the mulch. It provides carbon,

which stimulates certain bacteria to thrive. And that's as Glenn mentioned, the different studies on bacteria. And these bacteria, or bugs if you will, use up the available oxygen creating the perfect condition for different bacteria to thrive. And then these anaerobic bugs in turn create enzymes that break down solvents into harmless compounds. This process also proved to be very successful at Travis as one of the techniques proposed is a component of two different cleanup remedies.

The vegetable oil injections are similar to the bioreactor example in that they use a carbon donor source to increase the naturally occurring bacteria that create the conditions for a different bacteria to thrive and initiate a process called reductive dechlorination. This targeted approach of injecting vegetable oil directly into the areas of highest concentration and plumes has proven to be very beneficial with greater than 90 percent mass destruction in the areas that this technology was tried out.

We also tried phytoremediation or phytostabilization. It's the use of plants in stopping or cleaning up contamination. This is a long-term demonstration project that again proved to be useful. Red iron bark eucalyptus trees, and you can see some of them here being tested. They were planted in the late '90s at a groundwater solvent site. The trees' roots grow in search

of water and in this case the water was a plume containing a solvent, trichloroethylene, or TCE. The trees take the water up with the TCE and they use the water to live while the TCE is transpired into the air, where it quickly breaks down from exposure to ozone.

We had Utah State University conduct a transpiration test to confirm that TCE was being given off by the trees and to estimate how much TCE the trees are treating. And that's what you see in here with all these tubes. They would actually place a glass cylinder over a branch and run oxygen through it and then they were able to measure the residual TCE that was coming out of that. So it was a very interesting study to watch them do.

They also needed to do this so we could get an estimate of how much TCE the trees were treating for us. And while the amount treated by the trees now is very small it will increase with time as the trees grow larger. This is a true solar-powered cleanup operation.

While Utah State University was looking at transpiration of contamination out of the tree leaves they also looked at whether the trunk was transpiring solvents. They placed a device on the tree, circulated air, used a pump to pull air throughout the tree and determined that there was very little coming out of the trunk itself. But they also took core samples of the trees, sent them to a lab

for analysis, and there was an indication that there is TCE beginning to build up in the trees. So when the time comes for these trees to be removed, samples will need to be collected to determine what levels of solvents are in the trees at that time to see if the trees need any special handling or disposal.

Natural attenuation is Mother Nature working to break down harmful chemicals into harmless components. And during the interim period we looked at several natural attenuation factors in an effort to learn what the groundwater plumes were doing and why. By looking at the data we could easily see that the plumes were stable. That is, not migrating into areas of non-contamination. But why? One of the reasons we discovered was that there are naturally-occurring bacteria on Travis that create certain enzymes that naturally break down chlorinated compounds as described in the bioreactor example.

In the bioreactor, the perfect anaerobic conditions to increase the population of the target bacteria was established with the use of a carbon donor, the mulch. But even without the addition of a carbon source the bacteria are present throughout the base and they're breaking down solvents into harmless compounds.

Natural attenuation is just that, the plumes are reducing in size and concentration naturally without any

intervention from anyone. And the monitored part of this equation means the Air Force will continue to collect samples in order to monitor the progress of this naturally-occurring attenuation. And that's where -- illustrated here -- is lines of wells in all of these plumes. We collect samples, send them to a lab and get the data to make sure that the plumes are still shrinking and the concentrations are going down or if something else needs to be done.

Additional data gathering. We also used this interim period to gather some additional data, fill in some potential data gaps to ensure that the groundwater plumes were adequately defined. This additional data was used to develop the preferred remedies that are in the proposed plan.

The three of us, Mark, Glenn and myself, along with our contractor support team, have spent a lot of time preparing this proposed plan and we all feel good about what we are presenting to you this evening. And here are the proposed alternatives.

Alternative 1 is No Further Action and it means just that, no further action. As Glenn mentioned, there was one pesticide location that in the interim period the site met the cleanup levels. Once we document that in the Record of Decision that site will be closed because there is no longer any contamination there.

Alternative 2, Monitored Natural Attenuation. As I just mentioned, this is a naturally occurring process to break down contaminants.

Alternative 3, Groundwater Extraction and Treatment, or GET. Using pumps to bring the groundwater to the surface and treat it using activated carbon, or granulated activated carbon, GAC.

Alternative 4 is a combination of a bioreactor and groundwater extraction and treatment. Using a bioreactor at the higher concentrations and then groundwater extraction and treatment in the middle parts of the plume.

Alternative 5, Emulsified Vegetable Oil and Enhanced Attenuation. It's a treatment train kind of concept linking two different treatments. Injecting food grade vegetable oil into portions of the plume with higher concentrations to biologically degrade the contamination down to harmless byproducts. That's, again, the reductive dechlorination process.

And then Enhanced Attenuation. And I'll just throw a definition in there from the Interstate Technical Regulatory Council, Enhanced Attenuation is defined as a plume remediation strategy to achieve groundwater restoration goals by providing a bridge between a source zone treatment and MNA -- and/or between MNA and slightly more aggressive methods. So in-between where you've got

different treatment zones you have enhanced attenuation and that's what EA is defined as.

So Alternative 6 is Bioreactor, phytoremediation, EVO in a permeable reactive barrier, PRB, which is a line of wells where you inject the oil and enhanced attenuation. So that's a real long treatment train with several different treatment activities in one alternative.

And then finally we have Alternative 7, which is Passive Skimming and EA. At one location this will be used, or proposed to be used. It's a Stoddard solvent, which is a petroleum-based solvent that floats on the groundwater, so we'd put skimmers down in the wells. The skimmers would collect the floating-free product, and that would remove a source of continuing contamination. So this EA is -- since we removed the source, we're enhancing the attenuation downgradient of the plume.

And here is a figure of the map and you can see the outline, the outline of the plumes. There's three little sections of plumes that actually go off the base and those will show up here in a minute.

Alternative 1 is proposed for just one location. That's the pesticide site that I mentioned is ready to be closed.

Alternative 2, Monitored Natural Attenuation. A few more sites throughout the base where the concentrations

have already begun to drop.

Alternative 3, Groundwater Extraction and Treatment. And that's appropriate for the off-base plumes, because it's working real well and it's helping to pull that contamination back towards the base so it's appropriate for those locations.

Alternative 4, the bioreactor and groundwater extraction and treatment. And that's just one site, the big one in the middle of the base. It's appropriate there because it's real difficult to get underneath the flight line to do much else so this is the most appropriate that we could see at this point.

Alternative 5 is the Enhanced Vegetable Oil Injections and Enhanced Attenuation. And that's several sites near the industrial part of the base where this is the appropriate technique to clean up these locations.

Alternative 6 is the long treatment train with the bioreactor, phytoremediation, the EVO permeable reactive barrier and enhanced attenuation. And that's also just one location where the trees have already been planted. Site DP039 is the name of that, we call it that.

Alternative 7, Passive Skimming and Enhanced Attenuation. That's also just one site, one small location where the solvent is floating on top of the groundwater.

And then here is a figure with all the remedies

that are proposed across the base.

So what are the advantages of these proposed remedies? Well, there are several, several advantages to these. The proposed remedies will allow for cleanup to take place within the clay soil particles where the contamination is sticking, which makes conventional pump and treat difficult. And that's what Glenn was demonstrating with the sponge there.

It's much easier to have the treatment take place in situ underground rather than trying to pump millions of gallons of groundwater out for treatment. At some sites the contamination that was mobile has already been removed and treated and the residual contamination has bound on to clay particles, making groundwater extraction and treatment no longer a good remedy at these locations.

Also green and sustainable remedies are much more energy efficient and they are able to clean up contamination using less electricity, saving taxpayer dollars and reducing the generation of greenhouse gases.

At some sites where appropriate, such as those off-base plumes I mentioned, groundwater extraction and treatment is still working and is the right remedy. However, there are plumes on base where a natural process such as monitored natural attenuation or enhanced reductive dechlorination using bioreactors or vegetable oil injections

are more appropriate and will meet the necessary cleanup levels and do so in a much more cost-effective manner than using the more expensive groundwater extraction and treatment.

Now the final cleanup objectives are to protect human health, to clean up contaminated groundwater to federal or California cleanup standards as appropriate, to keep contamination from migrating any further, and to take no action that exposes protected plants or animals to the contaminated groundwater.

So with that information I'll turn it back over to Mark Smith.

RESTORATION PROGRAM MANAGER SMITH: Hello again. Thirty-five minutes into a technical presentation is not a good time to repeat myself, I'm sure, but I am going to anyway. The part I want to reiterate is that the preferred remedies that you have seen are proposed; they are not the selected remedies. This is a proposal. It is your opportunity to provide comments.

The public comment period, again, is open until 9 November. You can provide input here orally, you can write on the comment forms that we have, you can call us, you can email us. All the information for contact information is on the back of the proposed plan.

We will use these preferred remedies and your

input to help us select the final groundwater remedies that will go into the Final Groundwater Record of Decision.

If you would like additional information you may pick up a copy of the Travis newsletter, the Guardian, in the back. I showed that to you here. Or you can also download the proposed plan from our public website. The web address is shown at the bottom of our screen here. And I believe that's also in the proposed plan.

Historical information on the cleanup program may also be found at the Vacaville Library and of course you may call the Travis Public Affairs Office at the numbers shown here. The top number will get you directly to Merrie Schilter-Lowe and the bottom number will get you to the general Public Affairs Office. Yes, Mr. Reagan.

SUPERVISOR REAGAN: You have two library branches in Vacaville. Is it at both of them or one of them?

RESTORATION PROGRAM MANAGER SMITH: The one on Ulatis.

PROJECT MANAGER ANDERSON: The Cultural Center.

RESTORATION PROGRAM MANAGER SMITH: The Cultural Center.

At this time I'd like to open the meeting to any questions. Do we have any comment forms that have been filled out?

(No response.)

How about orally? Mr. Foster.

RAB MEMBER FOSTER: I have two questions.

RESTORATION PROGRAM MANAGER SMITH: Please, I'd like to ask that you stand. And I should have asked that of Mike Reagan as well. Stand, state your name, spell your last name and state your question for the reporter.

RAB MEMBER FOSTER: John Foster, F-O-S-T-E-R.

RESTORATION PROGRAM MANAGER SMITH: And your affiliation?

RAB MEMBER FOSTER: I don't know. I don't have an affiliation, do I? I'm a member of the RAB from the community.

RESTORATION PROGRAM MANAGER SMITH: Yes.

RAB MEMBER FOSTER: No affiliation.

On SS016 it shows -- looking at the Figure 4 layout of the preferred alternatives it has SS016 as an Alternative 4, bioreactor and ground extraction treatment. And that appears to be the area that's under a lot of concrete and so forth. How is that bioreactor going to actually work in there? Where is that planned for? I'm curious about that.

And my second question, I'll just throw that out there as well. On all these plans are there going to be any land use controls needed after everything is completed, in your projections?

RESTORATION PROGRAM MANAGER SMITH: I'll go ahead and take the first stab at that and, Lonnie, feel free to jump in at any time.

SS016 is this green plume on this map in the center of the base. The bioreactor is one of the demonstration projects already installed and already shown to be making cleanup progress. It's located right here where we believe was the source area of the contamination, where they used to degrease plane engines and they would dump the solvent into a drain here that leached and got into the ground.

The area shown in green and all the groundwater plumes are currently under land use controls. We have institutional controls or land use controls in place at all of our groundwater sites for the purpose of protecting the base population. Any trenching, any digging, any soil boring that actually comes in contact with groundwater in those areas.

We attend the meetings where the proponents' actions are discussed. We tell them, you're in the area of contaminated groundwater, this is the action you need to take. You need to containerize it, you need to dispose of it as waste, as a hazardous material. Or take it to the central plant and we'll treat it for them. Does that answer all of your questions?

RAB MEMBER FOSTER: No. The land use controls I was referring to, at the end of this process do you foresee the cleanup level to not require land use controls at all of these sites? There's going to be no -- the residential cleanup level? I mean, what is the final cleanup level? Are you going to have land use controls? That was the question.

RESTORATION PROGRAM MANAGER SMITH: It is my hope that we are able to clean up groundwater to the level that it does not require any land use controls. That is a discussion we still need to have with the Water Board. In some cases I think the Air Force's position is to clean up to minimum contaminant levels; is that right?

PROJECT MANAGER ANDERSON: Maximum.

RESTORATION PROGRAM MANAGER SMITH: Maximum contaminant levels, excuse me, MCLs. That's for further discussion between the Air Force and the Water Board on groundwater cleanup goals. But if we actually do reach an agreement that MCLs are safe there won't be any land use controls.

PROJECT MANAGER ANDERSON: That's correct. I mean, that's the idea is that once you reach the cleanup levels you've established then there is absolutely no need for them. The groundwater is safe for unrestricted use, unlimited use.

RESTORATION PROGRAM MANAGER SMITH: Unrestricted exposure.

PROJECT MANAGER ANDERSON: The acronym is UUUE and I can never remember what it stands for. But the bottom line is that the water can be used for anything as if the contamination never occurred in the first place. So land use controls are essential, you know, like Mark was saying, to protect human health, to prevent exposure and also to protect the infrastructure that we are using to conduct the remedies.

So they are absolutely essential during the time of when the final remedies are documented in the Record of Decision. They will be implemented based on the individual alternative. For each alternative the land use controls will be different. And once we've achieved the cleanup level and a period of time has been established that as long as there is no rebound and we don't see it coming back at all then we can demonstrate that yes, the final remedy was effective, it succeeded in what it was designed to achieve and the land use controls then will be removed.

RESTORATION PROGRAM MANAGER SMITH: Sufficient? Thank you.

RAB MEMBER FOSTER: As a member of the public I just wondered if your goal is to have a cleanup to that level when this is done that there won't be land use

controls? If that's the goal.

PROJECT MANAGER ANDERSON: Well, I mean, for example, we have one site where the alternative is no further action. We are not planning on having any land use controls assigned to that particular site because the work has been done.

That was a unique situation because we had interim cleanup goals for that site. And not only did the remedy achieve that but we can't even detect the contaminants anymore. The laboratory procedure we have doesn't go down that far. So even though we didn't have an established cleanup level, at the time because we couldn't find any more contaminant down there, the Air Force and the regulatory agencies signed a consensus statement that said, hey, we're done as far as the groundwater is concerned and we no longer have to collect any more samples. Because we had a track record of years of non-detects, non-detects throughout that whole, whole time.

So the whole idea is that at the time when we write our decision document, it goes through regulatory review, everybody signs it, land use controls will be established and then there will be language in there about what is required to basically turn things off and then decommission the infrastructure and remove the controls.

RESTORATION PROGRAM MANAGER SMITH: Yes,

Mr. Salcedo.

MR. SALCEDO: Jose Salcedo, S-A-L-C-E-D-O, I work for the Department of Toxic Substances Control. I want to make a comment.

All of the sites currently have land use controls on them right now. All of the alternatives, except for the no action, will continue to have that, as part of the alternative will still be land use controls. Those land use controls can be removed once they achieve below the cleanup goals. The Air Force requests regulatory agencies to remove those because the groundwater no longer poses a threat.

So it's implied that all of the remedies will continue to have as part of the alternative a land use control associated with them.

RESTORATION PROGRAM MANAGER SMITH: Thank you.

Are there any other comments regarding the proposed plan? Did everybody receive a copy of it? Yes?

Like I mentioned, you have through November 9th. Please have your comment forms postmarked by November 9th to us so that we can assemble them and work them into the responsiveness summary.

COMMUNITY CO-CHAIR MARIANNO: Could I make a comment?

RESTORATION PROGRAM MANAGER SMITH: Yes you may.

COMMUNITY CO-CHAIR MARIANNO: I'll introduce

myself. Dave Marianno, M-A-R-I-A-N-N-O.

I'm glad to see what's happening because I'm probably the one that would be threatened by a lot of this water, groundwater contamination, because I'm only about a half a mile from the contaminated water and I am pleased to see it being returned.

This land control. What I'm thinking now, you had ground -- you had contaminated water. Now what have we got? Contaminated soil with no water? Because what happens to the contamination? You're drawing it back, you're still -- as I hear in the comments here about it's in the clay or silt. It seems to me we've -- thank God we've got the water to where it's not encroaching on us anymore. But it seems like maybe the base might have another problem later on. Then we're going to --

Talking about land control, that's what I'm saying is that you're going to control -- you're going to -- in other words, broken land. I certainly hope that Travis never leaves us and it becomes a subdivision. but with land control is that what you mean by land control? That if it were to become public property then what would happen then?

RESTORATION PROGRAM MANAGER SMITH: Thank you. If Travis were to become public property, deed restrictions would have to be placed on those sections of land that have contaminated groundwater beneath them.

When you mentioned -- let me go back to your first comment about what do we have. We had contaminated groundwater. The concentrations in the contaminated groundwater plume or the area that is contaminated, the concentrations have reduced to a point where we think natural -- in the case of most of 16 here, for example, where we think natural attenuation processes will occur. Biological processes predominately will occur that help break down the contamination.

The contamination has a tendency to dissolve in groundwater, it also has a tendency to stick to clay particles. You can clean the groundwater, you can extract the groundwater and treat it. New rain water flushes in that is not contaminated. But if it sticks around those, hangs around those clay particles long enough some of the contamination may come off the clay particles and go into solution. So you're right. What we call that is rebound, you could still have contamination there.

Part of what Lonnie described with the emulsified vegetable oil involves going after those sticky parts of contamination, the soap in the sponge. Groundwater extraction and treatment works well on highly contaminated groundwater or groundwater that has larger concentrations of contamination. But once you get low enough in contaminant concentrations you are using more electricity than it's --

you're creating more greenhouse gases than the benefit you are doing by cleaning up.

So if you do an injection of emulsified vegetable oil it flows in with the groundwater, seeks out those particles, goes where the contamination pretty much went, and helps break down the contaminant into less harmful and not harmful compounds.

If you don't reach the agreed upon cleanup level in the Record of Decision the regulatory agencies and the Air Force will reach an agreed upon cleanup level. Not just the cleanup goals that we have in the interim Records of Decision but this groundwater ROD will have cleanup levels that we will want to achieve. Until we get to that we will have land use controls, deed restrictions. We'll limit access to that groundwater.

COMMUNITY CO-CHAIR MARIANNO: Thank you.

RESTORATION PROGRAM MANAGER SMITH: You're welcome. Okay, anything else?

(No response.)

At this time I'd like to adjourn the meeting and thank you all very much for coming.

(Thereupon, the public meeting adjourned at 7:52 p.m.)

--oOo—