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MEETING MINUTES FROM RESTORATION ADVISORY BOARD MEETING DATED 14
OCTOBER 1997 WITH TRANSMITTAL CNC CHARLESTON SC
11/3/1997
ENSAFE/ ALLEN AND HOSHALL



ENSAFE INC.

ENVIRONMENTAL AND MANAGEMENT CONSULTANTS

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November 3, 1997

Naval Base Charleston
Caretaker Site Office
Attn: Daryle Fontenot
2155 Eagle Drive
N. Charleston, SC 29418

Subject: Restoration Advisory Board Meeting Minutes (10/14/97)
Community Relations Subcommittee Meeting Minutes (10/14/97)
12/9/97 Meeting Announcement Flyer
Draft Fact Sheet #10 - The Corrective Measures Study

(CLEAN Contract #N62467-89-D-0318 CTO# 2900)

Dear Mr. Fontenot:

Please find enclosed a copy of the October 14, 1997 Restoration Advisory Board meeting minutes **without attachments**. Also enclosed are the original sign-in sheets, the audio tape of the meeting, and a diskette version with the file saved in WordPerfect 5.1, 6.1, and Microsoft Word for Windows 6.0. The diskette has been scanned for viruses and none were detected.

Also included in this package is a copy of the Community Relations Subcommittee meeting minutes, a copy of Draft Fact Sheet #10 - The Corrective Measure Study, and the 12/9/97 meeting announcement flyer. The standard press release announcing the December 9 meeting will be produced and distributed to the media the first week of December.

If you have any questions regarding the enclosed material, feel free to call me at (919) 851-1886.

Sincerely,

EnSafe Inc.

By:

Diane Cutler

Enclosures

cc: Jim Beltz, NAVFAC- SouthDiv
Todd Haverkost, E/A&H
Contracts File

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NAVAL BASE CHARLESTON
RESTORATION ADVISORY BOARD (RAB)
Minutes of 14 October 1997

LIVE OAK COMMUNITY CENTER, 2012 SUCCESS ST., N. CHARLESTON

1. Introduction of the RAB Members and Guests

Mr. Daryle Fontenot, Navy Co-Chair, brought the meeting to order. He announced that Bobby Dearhart and Bob Veronee called to inform the RAB that they are unable to attend tonight's meeting. He then introduced Ms. Vernell Simon who is sitting in for Wannetta Mallette-Pratt, Community Co-Chair. He also introduced Mr. Dann Spariosu, the new EPA representative replacing Mr. Jay Bassett. Member and guest introductions were made. Mr. Fontenot asked that any RAB member that will not be able to attend a meeting, please call to inform him in advance.

2. RAB Members Attending

Mr. Daryle Fontenot	Mr. Lou Mintz
Mr. Tom Fressilli	Mr. Arthur Pinckney
Mr. Wilburn Gilliard	Mr. Odell Price
Mr. Don Harbert	Ms. Ann Ragan
Ms. Jeri Johnson	LCDR Paul Rose
Ms. Vernell Simon for Ms.Mallette-Pratt	Mr. Dann Spariosu

3. Guests Attending

Mr. Tony Hunt	NAVFAC, SouthDiv
Mr. Henry Shepard	NAVFAC, SouthDiv - CSO
Mr. Gabriel Magwood	NAVFAC, SouthDiv
Mr. Paul M. Bergstrand	SCDHEC
Mr. Johnny Tapia	SCDHEC
Mr. J. Michael Reubish	CEERD
Ms. Evelyn McCullough	Community member
E. Washington	Community member
Mr. Oliver K. Berry	Community member
Ms. Michelle Loy	Community member
Mr. Benjamin Washington	Liberty Hill
Ms. Sandy Milliken	Community member
V.P. Simmon	Union Heights
Ms. Myrtle Barnett	Community member
Mr. Joe Byas	Dorchester Terrace,
Ms. Elizabeth A. Turner	U.S. Department of State
Glenn Hill	U.S. Department of State
Mr. Joseph M. Land Sr.	Galileo Quality Institute

Mr. Oscar McNeil	Bechtel
Mr. Keith Johns	EnSafe Inc.
Mr. Larry Bowers	EnSafe Inc.
Dr. Jim Speakman	EnSafe Inc.
Ms. Sandy Reagan	EnSafe Inc.

4. Administrative Remarks and Comments on Minutes

Mr. Fontenot asked for comments on minutes from the last meeting and for any other administrative remarks. None were offered, so the minutes will be accepted as they are.

5. Subcommittee Reports

Community Relations Subcommittee

Mr. Fontenot reported on the Community Relations Subcommittee. The subcommittee met prior to the RAB meeting with Mr. Fontenot, Lou Mintz, Fouche'na Sheppard, and Keith Johns (EnSafe - community relations support) in attendance. A fact sheet on the Corrective Measures Study process was reviewed. The fact sheet will be distributed before the December meeting; probably sometime in November. The next subcommittee meeting will be at 3:30 in the Caretaker Site Office conference room on December 9.

6. Environmental Cleanup Progress Report

Status of Environmental Programs

Mr. Fontenot gave a brief update on the Underground Storage Tank Program. To date, the Navy has removed approximately 101 tanks. They have also started the assessment phase where sites are reviewed to determine how much more needs to be cleaned up. Mr. Fontenot turned the meeting over to Tony Hunt to provide the progress report on the RCRA Facility Investigation.

Mr. Tony Hunt, with Southern Division, gave the update for August and September. The first item was submittal of the Site Specific Risk Assessments for 3 Solid Waste Management Units (SWMUs). That submittal completes the information that was needed for Zone A, the DRMO area. That report has been submitted and the Navy expects to enter into discussions regarding the Corrective Measures Study in the near future.

The Navy also conducted a pre-submittal review of Zone E; the Shipyard. Half of the site groupings were completed, the other half will be completed later in the week. Zone E is a big zone, and good progress was made last month.

The Zone H RFI report was approved in August and efforts have now moved into the CMS phase for this Zone. The Navy also submitted the RCRA Part B Permit renewal. It is what's known as the Hazardous and Solid Waste Amendments section. Mr. Hunt brought his personal copy for anyone who would like to look at it after the meeting. A public notice of this permit renewal will be announced in the newspapers, and individuals who live around the base will be notified.

Essentially, the renewal says that the Navy is conducting corrective action at specific sites. It also references the Information Repository as a location for more information.

Last time, Mr. Hunt talked about sites where the Navy intended to begin corrective action, specifically SWMUs 166, 39, and 607. Those are sites where there is groundwater contaminated with chlorinated solvents. Discussions are still ongoing, so Mr. Hunt will provide an update on those sites at a later date.

The project team has come to agreement on interim measures for SWMU 2 and two other sites. Mr. Hunt showed an overhead of SWMU 2 and explained that the issues were lead dust or lead oxides that were released and are predominately in the surface soil. The interim measure will remove or stabilize the lead contaminated soil so it doesn't migrate further to storm sewers, inlets, or the Cooper River. Mr. Mintz asked how it would be corrected. Mr. Hunt answered that inorganics such as lead don't tend to migrate very far, and if they are in the upper foot of soil, excavating the soil and filling it back in is a good option. The soil could also be mixed in with cement to immobilize and remove it. The final decision will depend on the final volume of contaminated soil.

The overhead displayed lines that depicted lead concentrations. Certain areas had lead levels above 450 parts per million (ppm), which is a residential action level. If the areas with lead concentrations over 450 ppm were remediated, they would be acceptable for residential use. Mr. Mintz asked about the groundwater. Mr. Hunt responded that with the interim measure, the Navy will only address the soil. The primary concern is dust from the lead. The water in the area had lead at levels just slightly above the maximum contaminant level (MCL) and will be addressed in the Corrective Measures Study.

Mr. Mintz asked if any of the "off-site" companies are going to help with the cleanup. Mr. Hunt responded that the company associated with the petroleum contamination at SWMU 39 is currently engaged in discussions with the State, and will probably assist with the cleanup at that site. Mr. Mintz asked if the Navy would clean up contamination that moved from the Navy onto someone else's property and Mr. Hunt answered yes.

Mr. Arthur Pinckney asked how much land is associated with the lead contaminated site. Mr. Hunt said the area is about 200 by 300 feet, probably about 3/4 of an acre total and about a foot deep.

Moving on, SWMU 8 is an oil sludge pit that the Navy used in the 1940s and 1950s to deposit waste oil, allowing it to dewater. The pit was then covered up. It appears that many of the dissolved organics have migrated out of the pits and are moving toward Shipyard Creek. Excavation was conducted in area 1 and is in the process in area 2 in order to remove as much of

the free product as possible. For an interim measure, the Navy intends to install pea gravel in a recovery system.

The third interim measure that the Navy is working on is at FBM 61. At this location there was a release of petroleum products back in the mid 1970s. There are some sumps there that are filled with light non-aqueous phase liquid (LNAPL). The Navy is in the process of collecting some of the LNAPL as part of the remediation. Mr. Pinckney again asked about the size of the area. Mr. Hunt said that it was probably about the size of the annex adjacent to the sump. Mr. Mintz asked if the Navy will be lining the sumps with anything. Mr. Hunt responded that they will use the sumps that are already installed. There are two 55-gallon drums that are welded on top of each other, and inserted down into the groundwater down to an impermeable marsh clay. They act ideally as a very large well casing and a good deal of free product can be collected with a bailer or a skimmer. These were put in place in response to the spill when it happened in the 1970s.

Mr. Mintz asked if the Navy has been able to use the groundwater flow survey that was conducted by the USGS. Mr. Hunt responded that the groundwater model will be a key tool in the Navy's Corrective Measures Study in determining areas of collection and well placement for groundwater treatment.

Mr. Mintz also asked when public input will be requested on the CMS for Zone H. Mr. Hunt stated that the work plan is in review. The actual study must be conducted and recommendations established before the public will be able to comment on those recommendations. The study should be complete by sometime next summer.

An audience member asked for clarification on the residential use of the lead-contaminated property near Virginia Avenue. Mr. Hunt explained that if a site is only remediated to industrial standards, its use is restricted to industrial-type activities. However, if remediated to residential standards, it eliminates restrictions on the type of use the property can have and gives the RDA the most options in leasing the property once the cleanup is complete.

Mr. Mintz requested an update on the Annex. Mr. Hunt reported that the Navy found chlorinated solvents in the sewer lines intermittently to Gas Light Square. It is questionable whether all of the solvents are from Navy operations because there are dry-cleaners in the area, and tetrachloethylene was found in the area and it was not a component of the solvents that the Navy used. So there is evidence that there is another release, possibly two in that vicinity. The hits were frequent enough to suspect a plume, but they were probably a result of releases from the sewer system. The Navy is doing additional work to get a better idea of the groundwater flow in that area.

Mr. Mintz asked if DHEC will require the Navy to clean up the sewers. Mr. Hunt stated that DHEC is looking into the possibility of another party being involved. Ms. Ann Ragan, with DHEC, added that there is a new program that is similar to underground storage tanks for dry-

cleaners. Operational dry-cleaners invest into a fund to remediate old dry-cleaning sites. Those sites will be ranked with the worst ones being addressed first. Mr. Mintz asked if dry-cleaners dumped chemicals down their drains. Ms. Ragan responded that they shouldn't have, but dry-cleaning facilities were operational before environmental guidelines were established, so you just don't know.

Chicora Tank Farm Update

Mr. Fontenot brought up the issue of Chicora Tank Farm. The Navy had installed a filter on the vent of one of the tanks, and he wanted to know if this has met the community's request to eliminate the odor. Mr. Fontenot asked for comments from representatives who live in the Chicora neighborhood. Nobody responded. Mr. Fontenot asked that members and guests solicit input from residents of that area to see if the effort was successful.

The Navy is continuing to proceed with the partial demolition of the Chicora tanks. They are currently waiting on funding and on the formal request from the City of North Charleston regarding the public benefit conveyance. Mr. Fressilli added that he spoke with the Superintendent of Operations for the school district who said the full board did vote on September 22 and expressed interest in acreage at Chicora. The Superintendent said he had authority of the school board to begin negotiations with the Navy. Mr. Fressilli provide information to assist the Superintendent in producing a letter and which explained responsibilities. Mr. Fressilli further requested that the letter written by the school board be sent to both the RDA and the City of North Charleston.

Mr. Mintz asked how serious the school board was about the property. Mr. Fressilli answered that the school board's only conditions were that option 3 - partial demolition - was successful and issues on liability are adequately addressed.

Mr. Fontenot reiterated that once the money is received, the Navy will begin by testing the partial demolition of one tank to make sure it is feasible. That will hopefully begin in the near future, and the detachment will be performing the work.

A representative from the Union Heights Neighborhood Council was concerned about the public benefit conveyance process. She said Union Heights representatives had a petition signed and were informed that they could have the property which they would make into a recreation area. However, shortly thereafter, she read an article in the paper that the property will be given to the school board. Mr. Fontenot explained that the City of North Charleston did not wish to take the entire Chicora Tank Farm. Since the school board also wanted some of the property, both parties would share in the public benefit conveyance. The City will be using their section for a park and the school board will be using theirs for the military magnet school.

Mr. Pinckney asked if he should be concerned about the emissions of the Chicora tanks. Mr. Fontenot explained that due to the content of the tanks and the nature of the fuel, there is no requirement to monitor the air from those tanks for those types of fuels. Mr. Fontenot's understanding is that the amount of emissions from the fuel in tanks like the Chicora tanks would not exceed a certain threshold.

7. Reuse Update

Ms. Jeri Johnson reported that there have been two meetings of the Redevelopment Authority (RDA) since the last update.

September 2: This meeting was the last one with Virgil Johnston as one of the North Charleston appointees. He has been replaced by Mr. Eugene Ott who is a local businessman. Actions at that meeting include increasing the budget for the foreign trade zone application. The RDA is still trying to designate the base as a foreign trade zone. However, that process is going to cost over \$25,000, so the RDA had to increase what they were going to pay and the Navy Office of Economic Adjustment has agreed to pay \$10,000 toward the application. The Authority also approved lease to SCE&G of approximately half of the former Sea Bee compound at the south end of the base. SCE&G is now leasing the electrical distribution system in anticipation of a purchase in two years and they needed a place for a lay down area and to make repairs. They have already started upgrading the system so they will be occupying about half of the compound - mostly metal huts - down at the south end of the base.

The authority also approved an amendment to the lease of Charleston Shipbuilders to occupy four family housing quarters on the base for use by Brazilian crew members for the power barge that CSI has contracted to build for Brazil. They also amended a license with Minor League Productions for use of the former band room where the environmental team used to meet, and one of the warehouses on the base for a 3-month period while they're filming the movie Major League III.

September 23: The Authority welcomed a new member, Jim Miner, who replaced Dr. Thadeus Bell. Mr. Miner is a former Shipyard worker. Both Dr. Bell and Mr. Johnston were two-year appointees. Half of the appointees had two year terms, the other half had four. The authority also approved award of a sewer cleaning contract to Infrastructure Rehabilitation Services out of Pompano Beach which is about a \$60,000 contract to clean and videotape the sanitary sewers in the shipyard area. That is part of the first EDA grant for utility systems improvements. The Authority was also notified that their second utility systems improvements grant for the base was approved by EDA. Each of those grants is \$2 million and the first grant is for the shipyard area and the second grant is for the northern area of the base. Both are for water and sewer system repair and replacement. The Authority also approved extension of its contract for legal council with Young, Clement, Rivers & Tisdale to June 30, 1998. They approved a license with the magnet school to hold two track meets in October at the former golf course. They also approved

a license with the Army Corps of Engineers for building 1127 which is a storage facility almost directly across Hobson Avenue from the former engineering management building.

The next meeting of the RDA will be Tuesday October 21, 1997 at 12:30. Ms. Johnson added that she has an updated tenant summary that lists all of the current tenants and sub-tenants and their number of employees.

Mr. Mintz asked who benefits from the free trade zone designation. Ms. Johnson answered that any current or future tenant that imports parts will benefit. It is an incentive to attract industry to the base.

Mr. Pinckney asked about the appointment process for the RDA representatives. Ms. Johnson replied that she does not know how individuals were selected. She added that there are three members from North Charleston and one each from Dorchester, Berkely, and Charleston Counties and the Authority lets those entities conduct their own method of selection. However, the Governor makes the final choice.

A community member expressed his concern about the fire hazard uncut grass is causing around the Eternal Father of the Sea Chapel. He has brought this to the attention of the City of North Charleston but with no results. He would like to see the grass mowed so it no longer poses a fire hazard to the wooden chapel. LCDR Paul Rose responded that he and Ms. Johnson will see to it that it is taken care of.

Another community member commented on the potholes in the streets near the magnet school and weeds growing around Sterret Hall in the parking lot which doesn't look very nice. Ms. Johnson responded that that area has been licensed to North Charleston. Part of the requirements for the license requires that North Charleston maintain the property. This is not the first time the Authority has heard complaints from the community about the level of maintenance, and both the Navy and RDA have been unhappy with the level of maintenance. Complaints about this issue should be brought to the attention of the City of North Charleston.

8. Remaining Questions and Comments

Mr. Fontenot addressed the issue of the community center hours being extended to 6 p.m.. He asked Ms. Myrtle Barnett, Director of the center, if this will create a conflict with the next meeting. Ms. Barnett said that the center can close early on the day of the meeting to accommodate the RAB.

Mr. Fontenot added that for anyone with internet access, the Charleston RAB is on the World Wide Web. The address is: http://www.navy.mil/homepages/navfac_southdiv/. Go to **SouthDiv Organization Chart**, then go to **Environmental** - there is a link to RABs.

Mr. Pinckney mentioned that the questions he submitted to Mr. Fontenot a few months ago were not all answered. Mr. Fontenot replied that he only provided answers to those of which the original answer had changed. He asked that Mr. Pinckney talk to him if he would like more information, or clarification about any of the answers.

The next meeting will be held on Tuesday December 9, 1997 at 6:00 p.m at the Live Oak Community Center at 2012 Success Street in North Charleston.

10. Adjournment

Summary of Action Items

- RAB and community members will solicit input on success of filter on Chicora tanks.
- LCDR Paul Rose will work with Jeri Johnson to have the grass mowed around the chapel.

Attachments to Minutes

- (1) Tuesday October 14, 1997 RAB Meeting Agenda
- (3) RCRA Facility Investigation Progress Update - 10/14/97
- (3) RCRA Facility Investigation Progress Report
- (4) Charleston Naval Complex - Tenant Summary, 10/14/97

Minutes recorded by: Diane Cutler, EnSafe Inc.

Minutes approved by: _____

Daryle Fontenot
Navy Co-Chair

Wannetta Mallette
Community Co-Chair

December 9, 1997

Naval Base Charleston

RAB Meeting

Restoration Advisory Board

DateTuesday, December 9, 1997

Time6 p.m.

Location...Live Oak Community Center
2012 Success Street
North Charleston

The RAB is a forum where community members meet with representatives from the Navy, State and Federal environmental agencies, and other groups to discuss the environmental programs underway at Naval Base Charleston. **All meetings are open to the public and everyone is encouraged to attend.**

For More Information



Call Jim Beltz at the Public Affairs Office
at Naval Facilities Engineering Command,
Southern Division: (803) 820-5771.

December 9, 1997

Naval Base Charleston

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For More Information



Call Jim Beltz at the Public Affairs Office
at Naval Facilities Engineering Command,
Southern Division: (803) 820-5771.

Community Relations Subcommittee Meeting

October 14, 1997

Time: 3:30 p.m. - 4:30 p.m.

Attendees: Daryle Fontenot, Louis Mintz, Fouche'na Sheppard, Keith Johns

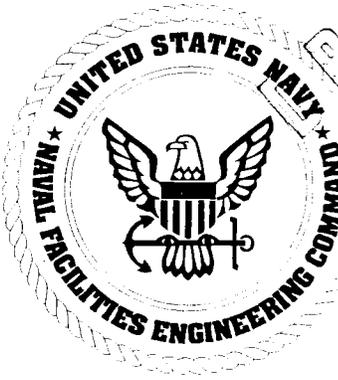
DISCUSSION ITEMS

Corrective Measures Study (CMS) Fact Sheet

The subcommittee reviewed the Corrective Measures Study Fact Sheet that was originally prepared for the Naval Support Activity, Memphis. A few edits to the existing fact sheet were made. Diane Cutler will make the changes and provide a draft to Daryle to pass by the Project Team for final approval.

NEXT MEETING

Subcommittee Meeting The next Subcommittee meeting will be held on December 9, 1997 at 3:30 p.m. in building NH-51 in the Caretaker Site Office conference room.



NAVAL BASE, CHARLESTON

Environmental Cleanup Program

This fact sheet is one of a series to inform interested citizens about the environmental investigations and cleanup actions at Naval Base, Charleston. Other fact sheets will be written at appropriate points in the program and in response to public interest. Distribution is coordinated through the Public Affairs Office at Naval Facilities Engineering Command, Southern Division, (803) 820-5771.

THE CORRECTIVE MEASURES STUDY

A Corrective Measures Study is one stage in the investigation and cleanup process that takes place under the Resource Conservation and Recovery Act (RCRA) Corrective Action Process. Certain facilities that treat, store, or dispose of hazardous waste in South Carolina – like Naval Base Charleston – must receive a permit from the U.S. Environmental Protection Agency and the South Carolina Department of Health and Environmental Control (DHEC). These facilities must follow the Corrective Action process outlined in the RCRA permit to address sites of hazardous waste contamination. This process is summarized briefly in the box to the right. More detail is provided in Fact Sheet 3, *Typical Site Cleanup*.

The Corrective Action process at Naval Base Charleston has reached the Corrective Measures Study (CMS) stage. This is the stage where decision makers will identify and evaluate potential alternatives at sites where remediation (which may or may not include physical cleanup) is required. Decision makers at Naval Base Charleston include the Navy, DHEC, and U.S. Environmental Protection Agency.

Steps in the Corrective Action Process

- ▶ RCRA Facility Assessment (RFA)
Preliminary study of the facility to identify potential sites of hazardous waste contamination
- ▶ RCRA Facility Investigation (RFI)
Detailed technical evaluation of the sites identified in the RFA, determining nature and extent of the contamination
- ▶ Corrective Measures Study (CMS)
Detailed evaluation of remedy alternatives, and a recommendation made to address site contamination
- ▶ Corrective Measures Implementation (CMI)
Implementation and monitoring of the remedy selected in the CMS stage

What is a CMS?

A Corrective Measures Study first identifies potential remediation technologies for a site, then screens them to determine if they will work for the specific contaminants identified and the site conditions. The CMS evaluates the most feasible alternatives based on nine criteria. A recommendation is then made and presented to the public.

What is *NOT* a CMS?

The Corrective Measures Study is *not* the “cleanup step,” but the step where alternatives for cleanup or remediation are reviewed. The CMS is *not* intended to select or choose the cleanup alternative, only to make a recommendation based on site-specific information. The scientific approach to this study is necessary to make a sound environmental decision. In some cases, the recommended alternative may not involve physical cleanup of contaminants.

“Remediation” vs. “Cleanup”

In this fact sheet, and in the environmental field in general, the words “remediation” and “remedy” are often used. Remediation is often thought of as “cleanup,” but this can be misleading. “Cleanup” suggests action to remove contamination, and is one *type* of remediation. Remediation can also refer to other activities that minimize or prevent exposure to contamination. Remedies can include capping (e.g., covering an area with clay or concrete to prevent rainwater from spreading soil contamination downward into groundwater), and institutional controls (e.g., fences or deed restrictions that prevent access and/or exposure to site contaminants). “Cleanup” may or may not be the best choice for a site, depending on the many factors evaluated during the CMS.

The Three Steps

A Corrective Measures Study follows three basic steps to review remediation alternatives for a site.

① IDENTIFY Potential Technologies

Decision makers review the data and reports generated during the earlier investigations. The goal is to find and list technologies that could work at the site. Selections are based on factors such as

- ◆ type of contaminant at the site
- ◆ type of media involved (soil, groundwater, air, surface water and/or sediment)

Decision makers also draw on their own professional experience and familiarity with similar sites when identifying methods that might work. Their job is to identify several remediation methods that can achieve the corrective action objectives for each affected medium (such as groundwater) at the site.

Innovative technologies are encouraged, especially where other options are limited. However, unproven technologies may require secondary/backup remedies.

② SCREEN Potential Technologies

In this step, decision makers look more closely at the technologies that were identified in the first step. Their goal is to eliminate remedies that are impossible or impractical for the site, or that are unlikely to perform satisfactorily at the site or within a reasonable period of time. Factors reviewed in this step include:

- ◆ Characteristics of the Site – Information about the site is reviewed to identify conditions that may limit or promote the use of certain technologies. Information reviewed includes: the size and depth of the contaminated site, geologic characteristics (e.g., sandy or rocky soil), and geographic characteristics (e.g., hillside, forest, or lake).

For Example:

Several types of remedies could be identified as possible solutions for groundwater contamination.

- ▶ **“Pump and Treat”:** Water can be pumped out, and the contaminants removed before sending the water to the municipal water treatment plant.
 - ▶ **Bioremediation:** Microorganisms can be introduced that “eat” specific chemicals.
 - ▶ **Institutional Controls:** Restrictions could be placed on use of the property or groundwater.
 - ▶ **Natural Attenuation:** Natural processes are allowed to break down the contaminants. This remedy would be monitored closely to ensure progress.
 - ▶ **Slurry Walls:** Physical barriers can be placed underground to prevent groundwater from moving beyond a certain point. This stops the groundwater and any contamination carried in it.
-

For Example:

In-situ vitrification is a remediation that reduces the mobility of heavy metals by heating the soil to the point where it is transformed into molten glass.

However, this technology is very expensive to implement, and heating the soil may cause contaminant migration. Additionally, the molten material could potentially interfere with underground utilities or future site use.

In this example, the disadvantages outweigh the advantages of this remedy.

- ◆ Characteristics of the Waste – Does it move easily? Does it evaporate? Is the contamination in one large place or many small spots? Technologies clearly limited in their effectiveness by such characteristics should be eliminated from consideration.
- ◆ Limitations of the Technology – Each technology identified must be reviewed. Technologies that are unreliable, perform poorly, or are not fully demonstrated may be eliminated. Decision makers may have to ask questions such as: Can the technology handle the volume of waste at the site? Does the technology have operating problems?

Impractical, unreliable, or unproven technologies may be excluded from further consideration at this point. Thus, only technologies that are technically feasible and practical are evaluated in the third step.

③ EVALUATE Potential Alternatives

Technologies that pass the screening step typically address one type of media each (e.g., soil or water), and are considered *potential alternatives*. Each alternative must be evaluated to see if it will achieve the corrective action objectives for that medium. Corrective Action objectives are set for each contaminated medium at a site. These are based on Federal and/or State standards and on risk to human health or the environment. Sites that are less complex may have only one potential alternative, and it may be a single technology. More complex sites may require that several technologies be combined into a single alternative to achieve the Corrective Action objectives.

This step is where potential alternatives are reviewed against nine criteria, described in the box below. Four of the nine are called *Primary Criteria* because they are tied to legal standards and must be met. The other five criteria are called *Secondary Factors* and must be objectively reviewed and considered in the decision.

<u>PRIMARY CRITERIA</u>	<u>SECONDARY FACTORS</u>
<p>1 Protect Human Health and the Environment Cleanup may not be necessary to meet this criterion. For example, if surface soil is contaminated, a solution might be to prevent people from coming in contact with the soil (perhaps by building a fence).</p>	<p>5 Long-term Reliability and Effectiveness Some systems must run for many years, and their reliability and effectiveness should be considered, based on previous uses. In addition, factors such as maintenance, useful life, and flexibility of the remedy should be considered.</p>
<p>2 Attain Cleanup Standards Corrective action objectives are set for each contaminated medium at a site, as described above. The chosen remedy must meet these objectives.</p>	<p>6 Reduction in Toxicity, Mobility and Volume An estimate must be made of how the remedy will affect the toxicity (harmful nature), mobility (movement), and volume (amount) of the contamination.</p>
<p>3 Control Source of Release The source may be an old, leaking tank, or it may be soil contaminated by a past spill. "Control" could be removal of the source, or it could be covering the source so no more contamination is washed out.</p>	<p>7 Short-term Effectiveness Short-term effectiveness, short-term dangers (such as fire or exposure to hazardous materials), and other consequences (such as loss of habitat) must be evaluated.</p>
<p>4 Comply with Applicable Standards Applicable standards include federal, state, and local laws and regulations. There may be others – such as Navy standards – which could be more stringent.</p>	<p>8 Implementability Reviews the technical and administrative ease with which the method can be implemented.</p>
	<p>9 Cost Calculates the estimated cost of preparing and implementing the remedy, including labor, maintenance, and other costs.</p>

Evaluation of potential remedies for sites at Naval Base Charleston will occur after the technologies have been identified and screened for feasibility. Once the evaluation process is complete, one remedy (or combination of remedies) will be recommended for each site as the *preferred* alternative.

Public Involvement at Naval Base Charleston

◆ In the Corrective Measures Study

After the CMS evaluation process is complete, the alternatives evaluated (including a recommendation) will be announced to the public and a public comment period will be provided. Public concerns will be considered before a final decision is made.

◆ Restoration Advisory Board

The Restoration Advisory Board is a group of citizens, Navy, city, state, and U.S. Environmental Protection Agency personnel that meets regularly to discuss progress on the environmental program at the base. These meetings are currently held bi-monthly, are open to the public, and attendance is encouraged.

◆ Information Repository

An information repository is a collection of documents that includes work plans, reports, and the Community Relations Plan. An information repository has been established as part of the Navy's program to inform the residents of North Charleston and surrounding areas about the environmental program at the base.

INFORMATION REPOSITORY

Dorchester Road Regional Branch
Charleston County Library
6325 Dorchester Road
North Charleston, SC 29418
(803) 552-6466

For More Information

For more information on the Naval Base Charleston environmental program, call or write: *Mr. Jim Beltz - Public Affairs Office, Naval Facilities Engineering Command, Southern Division, P.O. Box 190010, North Charleston, SC 29419-9010. (803) 820-5771.*
