



Brown & Bryant Superfund Site

United States Environmental Protection Agency, Region IX, San Francisco

Arvin, California

June 1993

EPA Announces Proposed Plan for Cleanup of Contaminated Soil and Groundwater at Brown & Bryant

This proposed plan announces the United States Environmental Protection Agency's (U.S. EPA) preferred **clean-up*** plan for the soils and the shallowest **groundwater** zone at the Brown & Bryant Superfund site in Arvin, CA. EPA's preferred clean-up alternative includes consolidation of contaminated soil on the southern portion of the site, installation of a multi-layered cap on the southern portion and a basic cap on the remainder of the site, and extraction from the shallowest groundwater, with treatment and reinjection of the treated groundwater.

EPA is the lead agency and California Department of Toxic Substances Control (DTSC) is the support agency for these actions. This plan is released to fulfill the requirements of section 117(a) of CERCLA (see box on page 10).

EPA began cleaning up the site in 1991 by excavating and treating the most contaminated soil.

A Remedial Investigation/Feasibility Study (RI/FS), addressing contamination at the Brown & Bryant site, has been released for public review and comment. The RI/FS is limited to the contamination in the surface soil, the subsurface soil (down to the first groundwater), and the first groundwater zone. The purpose of the Feasibility Study is to identify and evaluate potential cleanup actions for these three areas. The Feasibility Study does not address the deeper groundwater because EPA is still gathering information to make a determination.

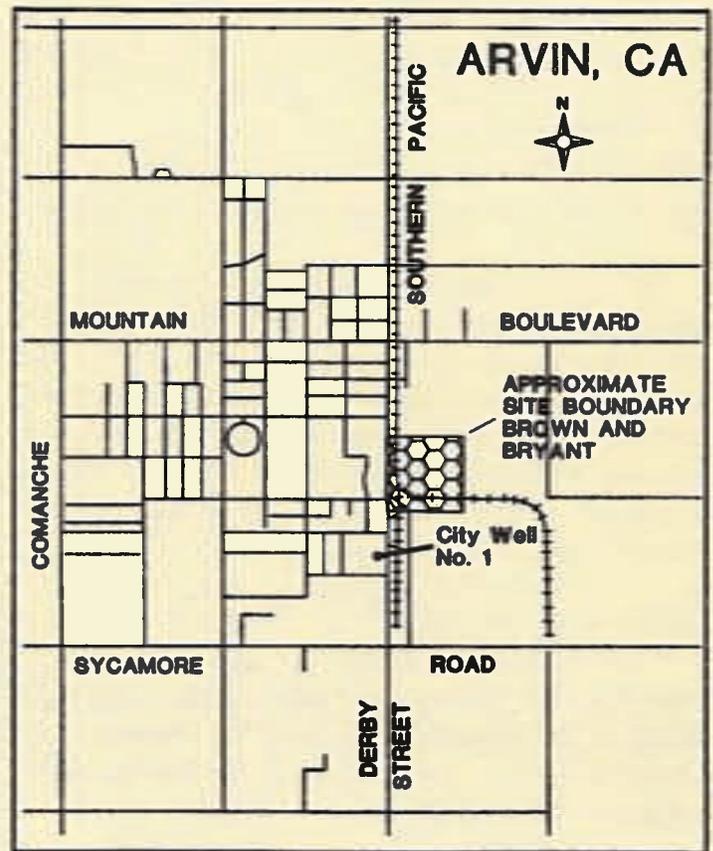


Figure 1: Map of the Brown and Bryant Site

provide your comments on all the alternatives described. After the public comment period, EPA will evaluate the comments received and make a final determination on the clean-up action. EPA will respond to the public comments in a Responsiveness Summary and then prepare a **Record of Decision (ROD)** to outline the final clean-up plan.

EPA encourages you to review this fact sheet and

* All words that appear in bold print are defined in the glossary on page 8.

Site Background

The Brown & Bryant facility in Arvin was an agricultural chemical distributor from 1960 to 1988. Accidental spillage and inadequate disposal methods during this time caused soil and groundwater contamination. In 1984, the State of California issued an order to Brown & Bryant to investigate the scope of the contamination problem. Throughout the 1980s, the state directed Brown & Bryant to address soil contamination.

In October 1989, the site was listed on the Superfund National Priorities List (NPL). In 1990, EPA collected soil samples and installed shallow monitoring wells, identifying areas that needed immediate attention. EPA also established a routine sampling program to test all site monitoring wells and nearby city wells.

In 1991, EPA excavated and treated the most contaminated soil containing the pesticide dinoseb. In that year, EPA also collected additional soil samples at the site and ordered Southern Pacific Transportation Company, and Atchison, Topeka and Santa Fe Railway to install additional monitoring wells, including several wells located between the site and the nearest city well.

More recently, EPA has assembled, tested and evaluated possible clean-up alternatives. These alternatives are briefly presented here and can be found in detail in the Brown & Bryant RI/FS report (First Operable Unit). The report can be located at the information repository (see box on page 11).

Site Description

There are many layers of groundwater beneath the Brown & Bryant facility. The first layer of groundwater, referred to as A-zone groundwater, is limited in extent and does not produce enough water to be classified as a drinking water source. At Brown & Bryant, this water is very contaminated with pesticides. The next layer of groundwater (B-zone groundwater) is not currently used as drinking water but has the potential to be used as such. Pesticides have been

detected in this groundwater at lower levels than the A-zone groundwater. The City of Arvin drinking water comes from a deeper groundwater layer below the B-zone, not currently affected by the contamination at Brown & Bryant (see Figure 3).

The goal for clean-up at Brown & Bryant is to protect all groundwater layers that currently or potentially could be used for drinking water and to prevent surface soil exposure. The objectives of this proposed plan are to control the A-zone groundwater, the major source of contamination that threatens the usable groundwater sources, and to address soil contamination.

EPA frequently divides a site into areas or operable units so that clean-up can proceed more quickly. EPA is not addressing the deeper groundwater zones in this proposed plan. They are being investigated as a second operable unit at the Brown & Bryant site. EPA is exploring the possibility of temporary action on the B-zone groundwater unit while the remedial investi-

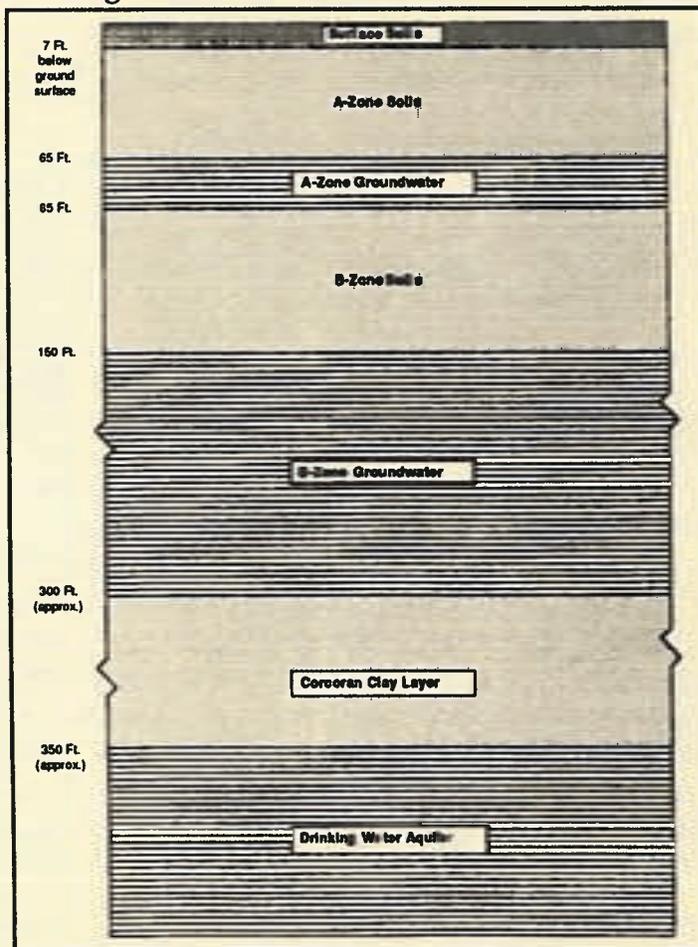


Figure 2: Brown and Bryant media of concern.

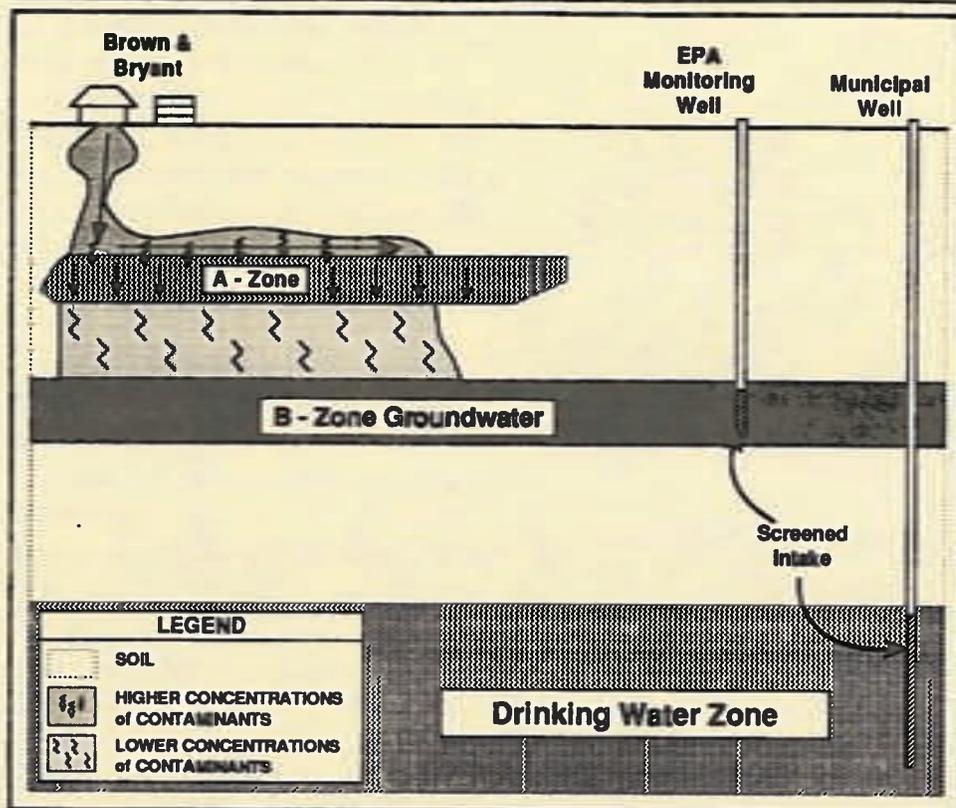


Figure 3: Water layers beneath Brown and Bryant

gation is conducted. However, the majority of the contamination remains in the A-zone groundwater and control of this source of contamination would greatly reduce the potential risk associated with the site.

Summary of Site Risks

The site was initially identified for the NPL because of the potential for exposure to contaminated groundwater and surface soil. The only pesticide in the surface soil is dinoseb, a noncarcinogen chemical (a chemical that does not cause cancer but may cause other adverse health effects). EPA's risk calculations for the Brown and Bryant site indicated that concentrations of dinoseb in the soil would pose a risk to a visitor to the site if exposed over a long time. In 1991, EPA treated the

most contaminated surface soil area and, consequently, the calculated risk was significantly reduced. However, some contaminated soil remains and still poses an unacceptable long-term risk. Due to the low contaminant concentrations in the surface soil, immediate adverse health effects are not likely.

There is no direct health threat from the contamination in the A-zone groundwater because it cannot be used for drinking water due to low water production. There is no immediate health threat from the contamination in the B-zone groundwater because drinking water is not currently being drawn from it. Drinking water wells draw from deeper aquifers not within the contaminated groundwater zone. On the basis of chemical transport models, it has been determined that the A-zone groundwater contamina-

tion, over time, would continue to leach down to the B-zone groundwater and cause concentrations to exceed levels deemed safe by EPA. Contamination in the B-zone groundwater could pose a threat to human health in the future if the A-zone contamination is not controlled and either if the B-zone is used for drinking water or the B-zone groundwater migrated to deeper groundwater.

Actual or threatened releases of hazardous substances from this site, if not addressed by the preferred alternative or one of the other active measures considered, may pose a potential threat to the public health, welfare or the environment.

Summary of Cleanup Alternatives

On the basis of the results of the remedial investigation, EPA identified six alternatives for addressing the soil and A-zone groundwater at Brown & Bryant. Detailed descriptions of the alternatives are provided in the RI/FS report which is located in the information repository. The alternatives were evaluated based on nine specific criteria (see "Selecting a Cleanup," page 9).

The alternatives presented here represent interim clean-up actions for the shallowest groundwater and the subsurface soils, and the final action for the surface soils. A subsequent and final Record of Decision will describe all the actions EPA will take to protect the drinking water including the B-zone groundwater.

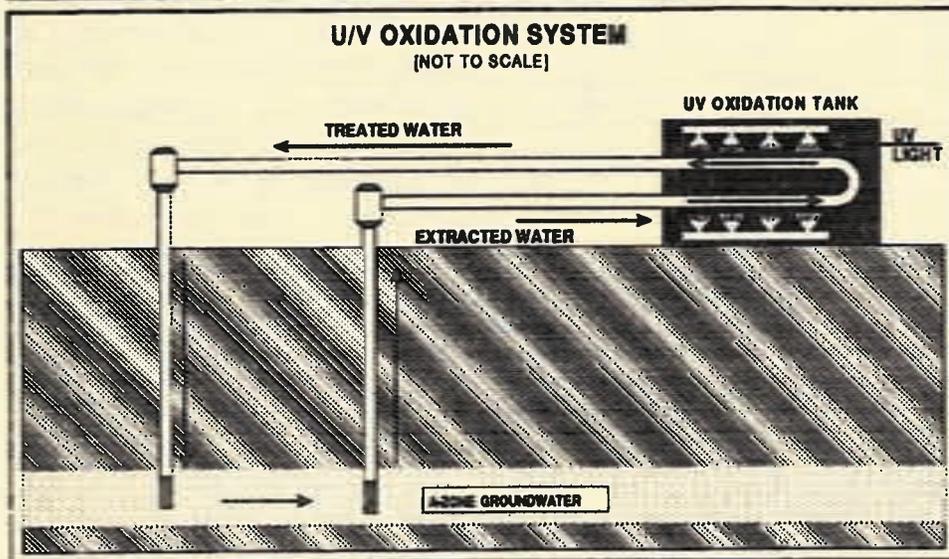


Figure 4: U/V Oxidation System

Controlling the A-zone groundwater is essential to protect against further B-zone groundwater degradation. Therefore, all alternatives, except the no-action one, contain an extraction, treatment and reinjection system in this zone. Although EPA is confident that extracting contaminated water from the A-zone will be effective, there is uncertainty as to the number of wells and time frame required for remediation of the A-zone groundwater. EPA intends to phase in the extraction/treatment/reinjection system to optimize design and control cost.

The extracted A-zone water will be treated using UV/Oxidation. The UV/Oxidation system is an innovative technology using ultraviolet lights and oxidation agents, such as ozone, to break down hazardous chemicals (see Figure 4). This process has successfully treated the A-zone groundwater contamination in pilot treatability tests and was employed in EPA's 1991 soil clean-up. UV/Oxidation was chosen because conventional technologies, such as carbon adsorption, do not

work on dinoseb, one of the principal contaminants in the A-zone groundwater. The groundwater will be treated until it meets maximum contamination levels established by state and federal regulations. After treatment, the extracted water will be re-injected into the contaminated portion of the A-zone to help flush out the remaining chemicals.

Another element common to all the action alternatives is a multi-layered/basic cap combination. The southern, most contaminated area of the property would be covered with a RCRA, multilayered cap and the remainder of the property would be covered with a basic cap, such as asphalt. The purpose of the cap combination is to minimize water infiltration. The RCRA cap also eliminates potential exposure to hazardous substances (see Figure 5, RCRA cap). A RCRA cap on the southern portion of the site is required for all waste ponds and sumps in operation after 1982. In addition to meeting legal requirements, a RCRA cap is a good technical solution because it is designed to be

protective when contamination remains. To assure the site remains safe after EPA completes the clean-up, deed restrictions or other institutional controls would be placed on the property to ensure the cap remains safely intact and soil under the cap remains undisturbed.

What differentiates the alternatives presented in this fact sheet are the actions proposed for addressing contaminated surface and subsurface soils. The alternatives include either consolidation of contaminated surface soil under the RCRA cap, treatment of contaminated surface soil and disposal off-site, or treatment of contaminated surface soil and disposal on-site. The subsurface soil may or may not be treated using soil vapor extraction depending on the added value and cost of this additional treatment.

All alternatives will undergo a review every five years to ensure protection of human health and the environment as required by EPA when some waste is left in place.

Alternative 1 - No-Action

Superfund regulations require EPA to include consideration of a no-action alternative for comparison with the other alternatives (#2 - #6). EPA presumes that even if the no-action alternative was selected, site monitoring would continue.

Alternative 2 - Consolidation of Contaminated Soil, RCRA/Basic Cap, Extraction and Treatment of A-zone Groundwater (EPA Preferred Alternative)

Under this alternative, as in all the action alternatives, a RCRA-type cap will be placed on the southern portion of the site containing the sump and the waste pond, and a basic cap will be placed on the remaining property. Deed restrictions would be recorded to assure the cap remains intact. This alternative varies from the other alternatives in its handling of soil containing dinoseb in excess of health-based standards. Such soil will be consolidated on the southern acre of the site under the RCRA cap. The amount to be excavated and consolidated is relatively small, since the majority of the contaminated soil is already located in the southern portion of the site. The contaminated soil in the southern portion of the site will not be moved prior to placement of the cap. Included in this alternative, as well as in all other action alternatives, is an injection and extraction system that would flush the A-zone groundwater and treat it using UV/Oxidation prior to reinjection.

Alternative 3 - Off-site Treatment of Some Surface Soil, RCRA/Basic Cap, Extraction and Treatment of A-zone Groundwater

Alternative #3 is identical to alternative #2 because it also includes a RCRA-type cap on the southern portion of site containing the sump and the waste pond, a basic cap on the remaining property, deed restrictions, and an injection and ex-

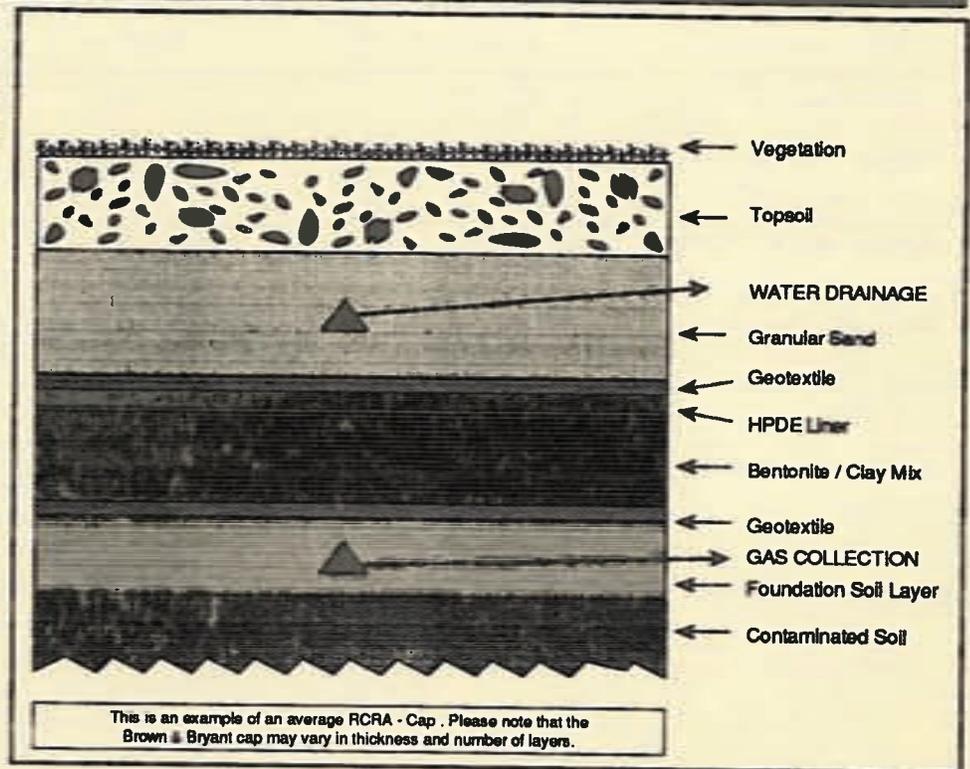


Figure 5: RCRA - Cap

traction system that would flush the A-zone groundwater and treat extracted water prior to reinjection. This alternative differs from alternative #2 in that the relatively small volume of surface soil with dinoseb in excess of health-based standards, in the portion of the site not covered by a RCRA cap would be excavated and treated off-site rather than consolidated on-site.

Alternative 4 - On-site Treatment of all Surface Soils, RCRA/Basic Cap, Extraction and Treatment of A-zone Groundwater

Alternative #4 is also similar to alternative #2. However, unlike consolidation or off-site treatment of some of the soil as envisioned in the earlier alternatives, alternative #4 would treat on-site through soil washing all surface soil with dinoseb in excess of health-based standards.

The treated soil would then be replaced back on-site. The volume to be treated is estimated at 650 cubic yards. All other aspects would be the same as described in Alternative #2, including a RCRA cap on the southern portion of site containing the sump and the waste pond, a basic cap on the remaining property, deed restrictions, and an injection and extraction system that would flush the A-zone groundwater and treat the extracted water prior to reinjection.

Alternative 5 - Off-site Treatment of Some Surface Soil, RCRA/Basic Cap, In-situ Treatment of Deeper Soils, Extraction and Treatment of A-zone Groundwater

Alternative #5 is identical to alternative #3, except it includes an additional treatment technology, Soil Vapor Extraction, to remove vola-

COMPONENTS	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3
RCRA/BASIC CAP	No	Yes	Yes
SURFACE SOIL TREATMENT	No	Consolidation under RCRA Cap	Off-site treatment of portion of soil outside RCRA cap
SUBSURFACE SOIL TREATMENT	No	No	No Treatment
EXTRACT AND TREAT A-ZONE GROUNDWATER	No	Yes	Yes

CRITERIA			
OVERALL PROTECTIVENESS	No	Eliminates exposure to surface soil; reduces potential groundwater risk by aggressively treating A-zone groundwater	Same as Alternative 2, additional treatment does not add protection
ARAR COMPLIANCE	No	Yes ¹	Yes
LONG-TERM EFFECTIVENESS	None	Very effective assuming cap is maintained; effective for source control of A-zone groundwater	Same as Alternative 2
TECHNICAL FEASIBILITY	Yes- No Action	RCRA cap is standard technology; Extraction efficiency from A-zone groundwater is unknown.	Same as Alternative 2
SHORT-TERM EFFECTIVENESS	None	Minimal short-term risks associated with cap installation, addresses soil contamination in shortest time-frame	Same as Alternative 2 and off-site transport of contaminated soil creates low-risk en route.
REDUCTION OF TOXICITY, MOBILITY OR VOLUME	None	Reduces mobility of surface and subsurface contamination, reduces toxicity and volume of groundwater contamination	Same as Alternative 2
COST			
(UP-FRONT)	\$0	\$3,634,000	\$3,859,000
(ANNUAL)	\$50,000	\$936,000	\$936,000
(PRESENT WORTH)	\$610,000	\$10,192,000	\$10,419,000

1/ EPA HAS DETERMINED THAT THE FACILITY IS ONE AREA OF CONTIGUOUS CONTAMINATION; THEREFORE, CONSOLIDATION OF SOIL IS PERMITTED

tile compounds in deeper soil (25 to 40 feet). All other aspects would be the same as described in Alternative #3, including off-site treatment and disposal of a small quantity of contaminated surface soil, a RCRA-type cap on the southern portion of site containing the sump and the waste pond, a basic cap on the remaining property, deed restrictions, and an injection and extraction system that would flush the A-zone groundwater and treat the extracted water prior to reinjection.

RCRA/Basic Cap, In-situ Treatment of Deeper Soils, Extraction and Treatment of A-zone Groundwater

Alternative #6 is identical to alternative #4, except it includes an additional treatment technology, Soil Vapor Extraction, to remove volatile compounds in deeper soil (25 to 40 feet). All other aspects would be the same as described in Alternative #4, including on-site treatment of all contaminated surface soil, a RCRA-type cap on the southern portion of site containing the sump and the waste pond, a basic cap on the remain-

Alternative 6 - On-site Treatment of all Surface Soils,

COMPONENTS	ALTERNATIVE 4	ALTERNATIVE 5	ALTERNATIVE 6
RCRA/BASIC CAP	Yes	Yes	Yes
SURFACE SOIL TREATMENT	On-site Treatment of all soil	Off-site treatment of portion of soil outside RCRA cap	On-site Treatment of all soil
SUBSURFACE SOIL TREATMENT	No	Soil Vapor Extraction (SVE)	Soil Vapor Extraction (SVE)
EXTRACTION AND TREAT A-ZONE GROUNDWATER	Yes	Yes	Yes

CRITERIA			
OVERALL PROTECTIVENESS	Same as Alternative 2, additional treatment does not add additional protection	Same as Alternative 2, additional treatment does not add additional protection	Same as Alternative 2, additional treatment does not add additional protection
ARAR COMPLIANCE	Yes	Yes	Yes
LONG-TERM EFFECTIVENESS	Same as Alternative 2, treatment of all surface soil permanently removes associated risk	Same as Alternative 3	Same as Alternative 4
TECHNICAL FEASIBILITY	Same as Alternative 2, On-site treatment technology proven at site	Same as Alternative 2, site conditions may not be optimal for use of SVE	Same as Alternative 4, site conditions may not be optimal for use of SVE
SHORT-TERM EFFECTIVENESS	Handling of surface soil causes short-term exposure risk, most time-consuming	Same as Alternative 2	Same as Alternative 4
REDUCTION OF TOXICITY, MOBILITY OR VOLUME	Reduces mobility of subsurface contamination, reduces volume of surface soil and groundwater contamination	Reduces mobility of surface contamination, reduces volume of groundwater and subsurface contamination	Reduces volume of surface subsurface and groundwater contamination
COST (UP-FRONT) (ANNUAL) (PRESENT WORTH)	\$4,712,000 \$936,000 \$11,272,000	\$4,409,000 \$1,036,000 \$11,069,000	\$5,262,000 \$1,036,000 \$11,922,000

Table A: Comparison table (left and right pages) of the Preferred Alternative and some alternates.

ing property, deed restrictions, and an injection and extraction system that would flush the A-zone groundwater and treat the extracted water prior to reinjection.

Evaluation of Alternatives and the Preferred Alternative

A comparison of the six alternatives against seven of the nine criteria is presented in Table A.

EPA believes that alternative #2, consolidation of

contaminated soil, RCRA/basic cap and extraction and treatment of A-zone groundwater, is the best alternative. This alternative offers the same overall protectiveness as the other alternatives; it is the simplest alternative with the least amount of short-term risk and uncertainty and it is cost-effective.

The California Department of Toxic Substances

Control conceptually concurs with EPA on the selection of the preferred alternative.

In summary, the preferred alternative is believed to provide the best balance of trade-offs among alternatives with respect to the criteria used to evaluate remedies. Based on the information available at this time, therefore, EPA and the State of California contend the preferred alternative would protect human health and the environment, would comply with ARARs and would be cost-effective. The preferred alternative would satisfy the preference for treatment as a principal element since the major source of contamination, the A-zone groundwater will be treated, and the most contaminated surface soil has already been treated by soil washing.

Pollution Prevention Tips: Proper Disposal of

Household Hazardous Waste

Drain cleaners, paint thinners, furniture strippers, automotive motor oil, pesticides and medicines are often disposed with household garbage, or in storm drains, septic tanks and sewers. When an entire community contributes to the problem, disposal of these items can create serious water quality problems for all water users.

Please do your part to encourage local leaders to institute a household hazardous waste collection program.



GLOSSARY

CLEAN-UP - Actions taken to deal with a release that could affect human health and/or the environment. The term "clean-up" is sometimes used interchangeably with the terms remedial action, removal action, response action, or corrective action.

GROUNDWATER - Underground water that fills pores between particles of soil, sand, and gravel or openings in rocks to the point of saturation. Where groundwater occurs in significant quantity, it can be used as a water supply.

RECORD OF DECISION (ROD) - A public document that explains the cleanup alternative(s) to be used at a Superfund site. The Record of Decision is based on information and technical analyses generated during the Remedial Investigation / Feasibility Study and consideration of public comments and community concerns.

RCRA - Resource Conservation and Recovery Act. A federal law that established a regulatory system to track hazardous substances from their generation to disposal. The law requires safe and secure procedures to be used in treating, transporting, storing and disposing hazardous substances. RCRA is designed to prevent the creation of new uncontrolled hazardous waste sites.

NATIONAL PRIORITIES LIST (NPL) - EPA's list of top priority hazardous sites that are eligible for investigation and cleanup under the federal Superfund program.

OPERABLE UNIT - Term for each of a number of separate activities undertaken as part of a Superfund site cleanup. A typical operable unit would be removing drums and tanks from the surface of a site.

SELECTING A CLEANUP REMEDY

The U.S. EPA uses nine criteria to evaluate alternatives for cleaning up a hazardous waste site. The nine criteria are as follows:

1 Overall Protection of Human Health and the Environment



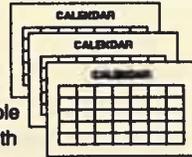
Addresses whether a remedy provides adequate protection of human health and the environment, and describes how risks are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

2 Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)



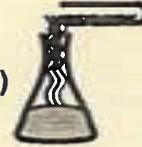
Addresses whether a remedy will meet all ARARs or Federal and state environmental statutes and/or provide grounds for invoking a waiver.

3 Long-term Effectiveness



Refers to the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup goals have been met.

4 Reduction of Toxicity, Mobility, or Volume Through Treatment (TMV)



Refers to the anticipated ability of a remedy to reduce the toxicity, mobility and volume of the hazardous components present at the site.

5 Cost



Evaluates the estimated capital, operation and maintenance costs of each alternative.

6 Short-term Effectiveness



Addresses the period of time needed to complete the remedy, and any adverse impacts on human health and the environment that may be posed during the construction and implementation period, until the cleanup goals are achieved.

7 Implementability



Refers to the technical and administrative feasibility of a remedy, including the availability of materials and services needed to carry out a particular option.

8 State Acceptance



Indicates whether, based on its review of the information, the state concurs with, opposes, or has no comment on the preferred alternative..

9 Community Acceptance

Indicates whether community concerns are addressed by the remedy and whether the community has a preference for a remedy.



Although public comment is an important part of the final decision, EPA is compelled by law to balance community concerns with all of the previously mentioned criteria.

FINAL REMEDY

What is Superfund?

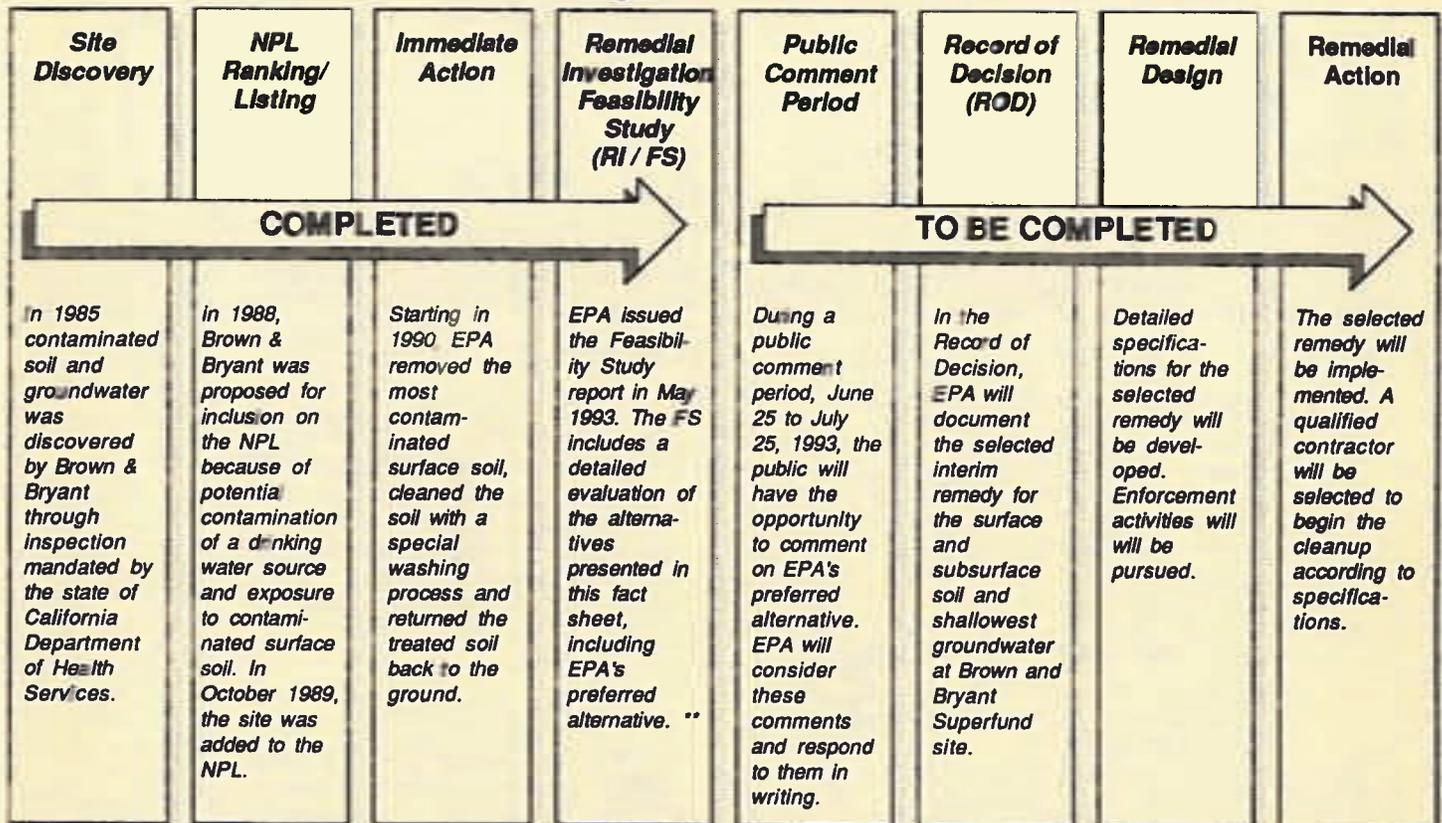
Superfund is the commonly-used name for the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), a federal law enacted in 1980.

This law was amended in 1986 by the Superfund Amendments and Reauthorization Act. CERCLA enables EPA to

respond to hazardous waste sites that threaten public health and environment.

The figure below illustrates Brown & Bryant's current stage in the Superfund process.

The Superfund Process



Community Relations Activities Occur Throughout the Superfund Process

** This FS is for the surface and subsurface soil and shallowest groundwater (the first Operable Unit). In September 1992, EPA started the RI for the deeper groundwater (the second Operable Unit).

Technical Assistance Grants (TAGs)

EPA has a community relations activity called the Technical Assistance Grants Program. The purpose of the TAG Program is to assist community groups in interpreting technical information. Under this program, one eligible group at each Superfund site may obtain one grant of up to \$50,000 in federal funds to provide technical assistance in understanding site documents. To be eligible, a group must be:

- ◆ Incorporated
- ◆ Able to meet a 20% matching funds requirement (in-kind contributions - i.e., donated goods and services are permissible), or obtain a waiver of this requirement
- ◆ Capable of preparing a plan to use technical assistance based on the schedule for preparing cleanup plans and carrying out the cleanup activities.

For more information about the TAG program, please contact Angeles Herrera at 1-800/231-3075 and leave a message. She will return your call.

For More Information

Documents for the Brown and Bryant Superfund Site are located in the information repository at:

Kern County Library
123 "A" St.
Arvin, CA 93203
(805) 854-5934

Beale Memorial Library
701 Truxtun Ave.
Bakersfield, CA 93301
(805) 231-3075

Questions Answered

If you have questions about the Superfund cleanup at Brown & Bryant, please call or write EPA's Community Relations Coordinator for the site:

Angeles Herrera
U.S. EPA, Region 9
75 Hawthorne Street (H-1-1)
San Francisco, CA 94105

You may also call EPA's toll-free Superfund hotline and leave a message. Your call will be returned. The hotline number is: (800) 231-3075.

MAILING LIST

If you did not receive this Brown & Bryant fact sheet in the mail and would like to be on our permanent site mailing list, please fill out and return this coupon to:

Angeles Herrera, U.S. EPA, Community Relations Coordinator
75 Hawthorne Street, (H-1-1), San Francisco, CA 94105-3901.

Name: _____

Address: _____

City/State/Zip Code: _____

Opportunities for Public Involvement

Community Meeting

Community members are invited to attend a public hearing regarding the cleanup alternatives for the Brown & Bryant Superfund site. The meeting will be at 7 p.m., Tuesday, July 6, 1993, at Sierra Vista School, 300 Franklin St., Arvin, California. At the meeting, EPA will present the proposed plan, respond to questions, and receive oral and written comments from the public.

Public Comment Period From June 25, 1993 to July 26, 1993

During this period, you are encouraged to express your opinions on the proposed plan and the other alternatives considered for the Brown & Bryant site cleanup. Comments may be submitted orally, or in writing, at the public hearing, or be mailed no later than July 26, 1993 to:

Cynthia Wetmore, Remedial Project Manager
U. S. EPA, 75 Hawthorne St. (H-6-2), San Francisco, CA 94105 - 3901

EPA may extend the comment period an additional 30 days if requested.

United States Environmental Protection Agency
Region 9
75 Hawthorne Street (H-1-1)
San Francisco, CA 94105
Attn: Angeles Herrera

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**Adentro: Información acerca
actividades de limpieza en el sitio
de Superfund Brown y Bryant**

**INSIDE: Update on activities at the
Brown & Bryant Superfund Site**