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September 1990

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Superfund Record of Decision:

J. H. Baxter, CA

50272-101

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15. Supplementary Notes

16. Abstract (Limit: 200 words)

The J.H. Baxter site is in Weed, Siskiyou County, north-central California, and consists of the 33-acre J.H. Baxter facility and the adjacent 870-acre Roseburg Forest Products facility. These properties continue to be used for wood treatment operations and lumber product manufacturing. The site is surrounded by pasture and woodland areas with residential areas to the north and west. Man-made and natural wetlands exist within the site boundaries, and Beaughton Creek runs through the eastern portion of the site. Since 1937, wood treatment operations at the site have involved a variety of chemicals including ammonical copper-zinc-arsenate, creosote, and PCP. Numerous waste products have been generated including tank and retort sludges, process water, storage area drippings, and spilled raw preservative compounds. Prior to 1983, when the State ordered the J.H. Baxter facility to cease all waste disposal practices, onsite waste management involved onsite disposal and discharge, spray irrigation of wastewater onsite, storage in tanks and ponds, and discharge of wastewater into the bermed area around a 500,000 gallon tank, once used for creosote storage and currently used for process water storage. These disposal practices and leakage from storage tanks led to soil and sediment contamination. Water that was collected by the lumber operations

(See Attached Page)

17. Document Analysis a. Descriptors

Record of Decision - J.H. Baxter, CA
First Remedial Action - Final
Contaminated Media: soil, sediment, gw, sw
Key Contaminants: organics (PAHs, dioxins), metals (arsenic)

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

18. Availability Statement	19. Security Class (This Report) None	21. No. of Pages 203
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(See ANSI-Z39.18) *See Instructions on Reverse* OPTIONAL FORM 272 (4-77) (Formerly NTIS-35) Department of Commerce

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J.H. Baxter, CA
First Remedial Action - Final

Abstract (Continued)

drainage system was discharged to Beaughton Creek until 1987, at which time a carbon adsorption system was installed to treat the extracted ground water. The primary contaminants of concern affecting the soil, sediment, ground water, and surface water are organics including PAHs and dioxins; and metals including arsenic.

The selected remedial action for this site includes excavation of 41,000 cubic yards of contaminated soil, followed by biological treatment for soil with organic contaminants, chemical fixation for soil with inorganic contaminants, biological treatment and chemical fixation for soil with both inorganic and organic contaminants, and onsite disposal of treated soil in lined cells; leachate collection and treatment; ground water pumping, followed by biological treatment, chemical precipitation, and polishing, prior to onsite discharge of treated ground water; implementation of institutional controls; and long-term ground water, surface water, and air monitoring. All sediment in the site drainage system with detectable levels of wood treatment chemicals will be excavated and treated with stabilized soil. No remedy for the Beaughton Creek sediment is proposed unless additional data indicate the need for further action. Surface water contamination will be controlled through soil remedial actions that will reduce contact between the contaminated soil and surface water. The estimated present worth cost for this remedial action is $37,829,100, which includes an annual O&M cost of $1,207,600 for 30 years.

PERFORMANCE STANDARDS OR GOALS: Chemical-specific cleanup goals for soil remediation include arsenic 8 mg/kg (background), carcinogenic PAHs 0.5 mg/kg (10^{-6} risk level and detection limit), and dioxin 1 ug/kg (detection limit). Chemical-specific goals for ground water remediation are based on MCLs or non-zero MCLGs, State MCLs, the 10^{-5} to 10^{-6} risk range, or whichever is more restrictive, and include arsenic 5 ug/l (10^{-5} to 10^{-6} risk range), PAHs 5 ug/l (detection limit), and dioxin 0.000025 ug/kg (10^{-5} to 10^{-6} risk range).

J.H. BAXTER SUPERFUND SITE

WEED, CALIFORNIA

RECORD OF DECISION

SEPTEMBER 25, 1990

BAXTER RECORD OF DECISION

DECLARATION

SITE NAME AND LOCATION
J.H. Baxter Site
Weed, CA

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial actions for the J.H. Baxter Site in Weed, California, chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA), and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision is based on the administrative record file for this site.

The State of California concurs with the selected remedies.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response actions selected in this Record of Decision (ROD), may present an imminent and substantial endangerment to public health, welfare, or the environment.

DESCRIPTION OF THE REMEDY

The response actions address the documented principle public health and environmental threats from the site contamination. Actions have been selected to address the contaminated soils, groundwater, and surface water. The major components of the selected remedies include the following:

- Extraction of the contaminated groundwater followed by biological treatment and chemical precipitation, polishing, and disposal. The end use of the treated groundwater will combine one or more of the following methods: reinjection to groundwater, release to subsurface drains or trenches, industrial process use, and/or disposal to percolation ponds.

- Excavation of the organic contaminated soils and biological treatment in lined treatment cells.

- Excavation of the inorganic soils and chemical fixation followed by on-site disposal in lined treatment cells for treated soils designated as hazardous waste.
- Excavation of the combined organic/inorganic soils, biological treatment in lined treatment cells, excavation, chemical fixation, and on-site disposal into lined cells.

STATUTORY DETERMINATIONS

The selected remedies are protective of human health and the environment, they comply with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and they are cost-effective. The remedies use permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable and satisfy the statutory preference for remedies that employ treatment to reduce toxicity, mobility, or volume as a principal element. The groundwater remedy involves treatment estimated to take at least 30 years to reach remedial objectives; and the organic and combined organic/inorganic soil remedies involve treatment estimated to take approximately 10 years to reach remedial objectives. Because this remedy will result in hazardous substances remaining on-site above health-based standards, a review will be conducted within 5 years of commencement of remedial actions to ensure that the remedies for groundwater, surface water and soils continue to provide adequate protection of human health and the environment.

John Wise   9.27.90

Signature   Acting   Date
Regional Administrator

1.0 SITE LOCATION AND DESCRIPTION

The J.H. Baxter site, also known as the Baxter/International Paper/Roseburg (B/IP/R) site, is composed of properties previously owned by International Paper and predecessor companies, and is currently owned by J. H. Baxter & Company and Roseburg Forest Products. The properties have been historically used and continue to be used for wood treatment operations and lumber product manufacturing.

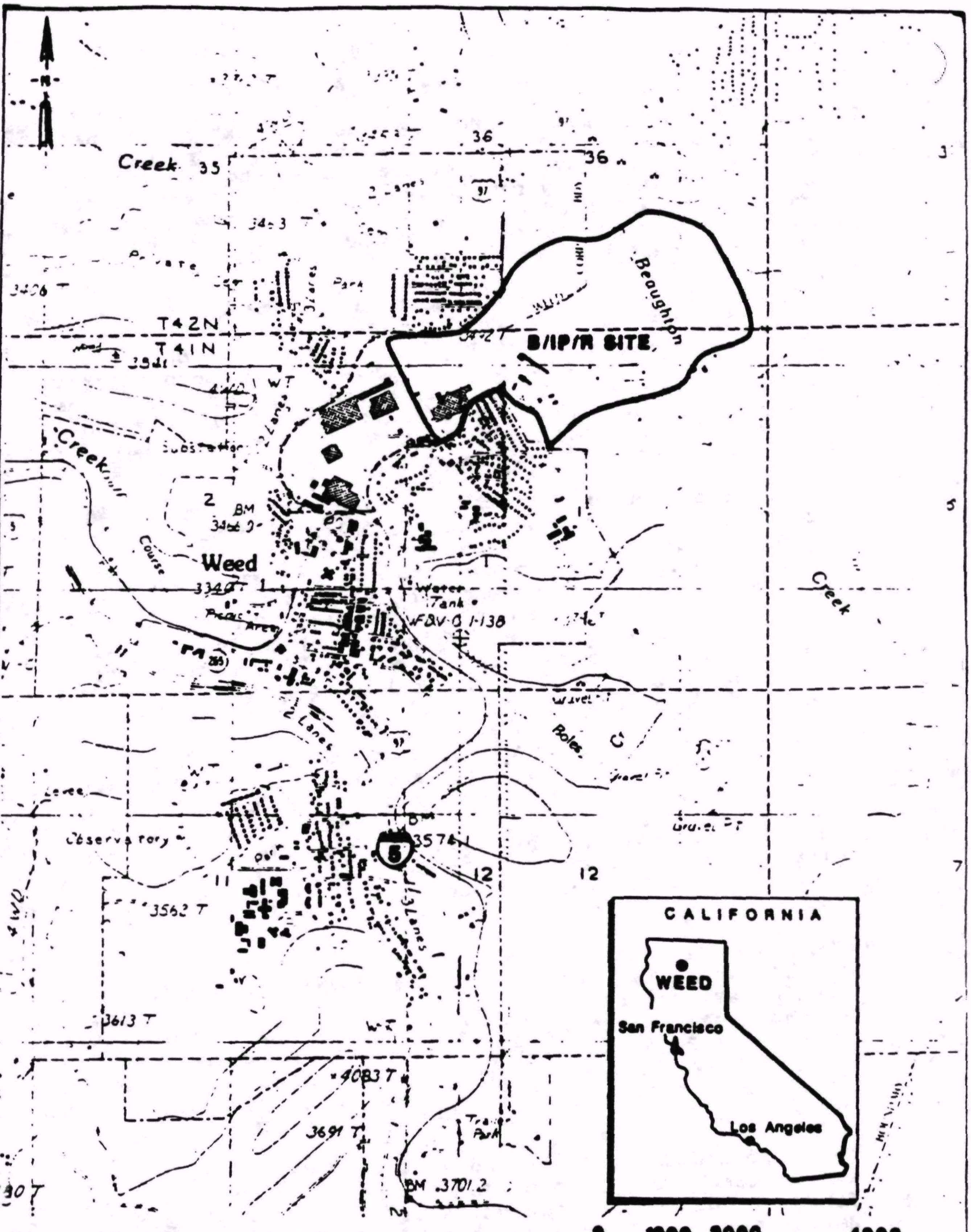
The site is located on the northeastern margin of the city of Weed, Siskiyou County, California (Figure 1-1). Weed is located in the southeastern margin of Shasta Valley, about 10 miles west-northwest of the peak of Mount Shasta, and approximately 40 miles south of the Oregon/California border (Figure 1-2). The city is situated at the crossroads of Interstate Highway 5 and Highway 97, which connect the Shasta Valley area with nearby cities in Oregon and northern California.

The site is bordered on the west and north west by residential areas of Weed including Siskiyou Union High School, to the north by Angel Valley Subdivision and Lincoln Park, to the east by mixed-woodlands, and to the south by irrigated pasture. Beaughton Creek runs through the eastern portion of the site and forms the northern boundary of the site (Figure 1-3). Land use in the site area consists of industrial activities carried out by J.H. Baxter, Roseburg Forest Products, and Morgan Wood Products. Land use adjacent to the site consists of pasture, mixed-woodland, wildlife habitat, and residential development.

Regional physiographic features include Shasta Valley, along with Mount Shasta, Mount Shastina, and Black Butte. The site is underlain by coalescent fans of pyroclastic, mudflow, glacial, and fluvial deposits off the northwestern flank of Mount Shasta and Mount Shastina. The water table is shallow, 0-10 feet below ground surface, emergent in some areas of the site, and exhibits fluctuation with variable recharge conditions due to rainfall and snow melt.

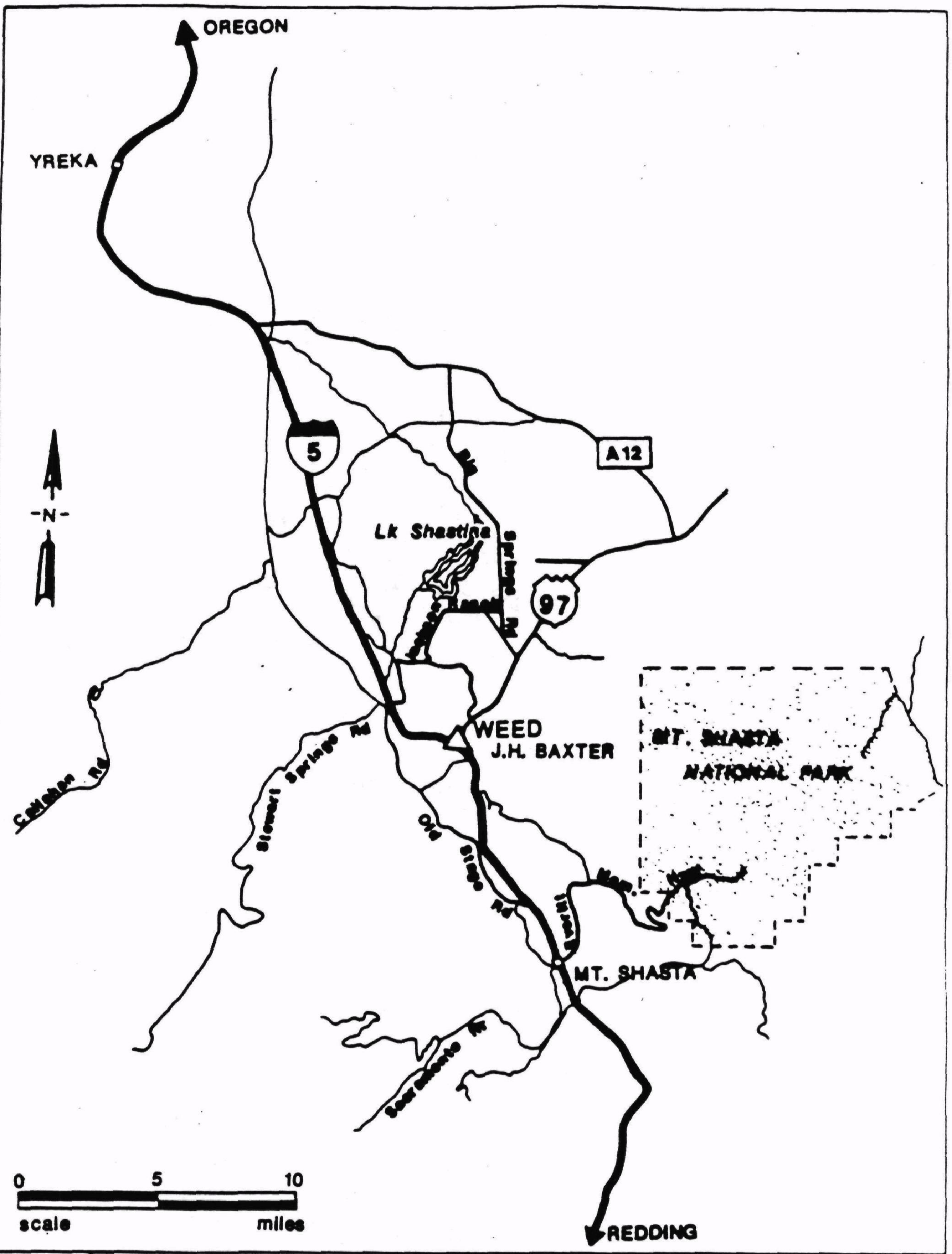
The study area sits at an elevation of 3,400 feet above sea level. The site receives most of its average 27 inches of precipitation during the winter as rain and snow. Temperatures in the area are generally quite warm in the summer (daytime average of 90°F) and cold in the winter (daytime average of 32°F). Prevailing winds are from the north at 320 degrees and from the southeast at 120 degrees. Winds can gust to speeds in excess of 50 miles per hour from the south.

The wood treatment plant and its numerous structures and surrounding grounds comprise approximately 33 acres. Roseburg Forest Products owns approximately 870 acres adjacent to the J.H. Baxter facility. Wood treatment operations on the J. H. Baxter

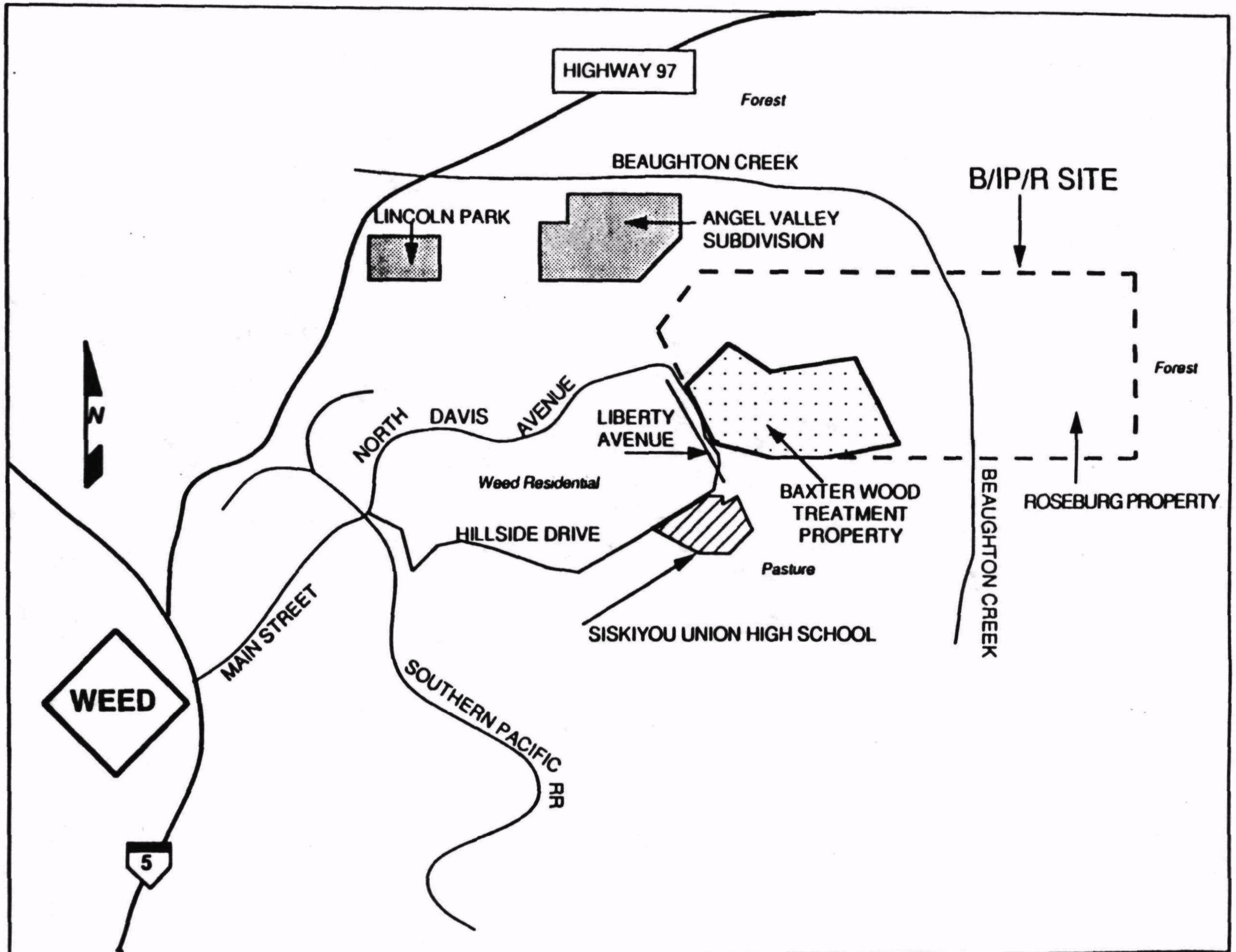


Source: USGS Topographical Quadrangle Map
7.5 Minute Series

	B/IP/R Site - Weed, CA	LOCATION MAP	Figure 1-1
	U.S. EPA		



B/IP/R - Weed, CA	REGIONAL LOCATION MAP	Figure 1-2
U.S. EPA		



B/IP/R - WEED, CA	SITE LOCATION MAP	Figure 1-3
U.S.		

property consist of a retort building with two pressurized wood treating vessels (retorts), a kiln for wood drying, storage shed for treated lumber, an incisor building to prepare wood for treatment, a chemical mixing building, chemical storage tanks, a 500,000-gallon tank once used for creosote and currently used for process water storage, treated wood storage areas, drip pads in front of the retort, a poleyard, office building, and abandoned wastewater impoundments. The two cement-lined impoundments had a capacity of 163,537 and 81,480 gallons each.

Lumber operations on the Roseburg property include several sprinkler decks for irrigating logs, dry log-storage decks, sprinkler system recovery ponds, a lumber mill and veneer plant, processed wood storage yard, and a wood-fuel power plant. Notable features on Roseburg's property include an excavation and french drain system placed on site in 1983. The excavation exposed contaminated groundwater and the french drain system intercepts and redirects groundwater downgradient of the eastern half of the wood treatment property. Neither the french drain nor the excavation were constructed as part of any remedial effort. Prior to the winter of 1987-88, water collected by the french drain was discharged to Beaughton Creek. During the summer of 1988, Roseburg installed an activated carbon treatment plant to treat extracted groundwater. The treated water is either pumped into the log deck sprinkler system or discharged into Beaughton Creek. The National Pollutant Discharge Elimination System (NPDES) permit for the discharge has expired and Roseburg has applied to the North Coast Regional Water Quality Control Board (NCRWQCB) for renewal of the permit.

Man-made and natural wetlands exist within site boundaries. Only man-made wetlands have been affected by contamination. These wetlands consist of irrigated pasture, Roseburg excavation pond, and wet areas created by discharges from the Roseburg power plant. The former Baxter spray field, used for disposal of wastewater, also exhibits wetland characteristics. Of these wetlands, the Roseburg excavation pond and the Baxter spray field will be affected by the proposed remedy. The disposal options for treated groundwater present opportunities for increasing wetlands in the vicinity of the site through surface discharge options.

2.0 SITE AND ENFORCEMENT HISTORY

Wood treatment operations using chemicals to preserve lumber products were initiated at the site in 1937. The complete history of chemicals used in the early years of operation is not known. Tanalith and Minalith were used in treatment processes until the mid-1950's. Tanalith is a mixture of sodium fluoride, sodium dichromate, arsenic, and dinitrophenol. Minalith is a mixture of diammonium phosphate, ammonium sulfate, sodium tetraborate, and boric acid. FCAP, a fluoride-chrome-arsenic-phenol mixture, is reported to also have been used. In the late 1960's, the use of chromated zinc chloride was removed from the on-site wood treatment process. Ammoniacal copper arsenate (ACA) was also used as a preservative.

Reports indicate that pentachlorophenol (PCP) was used for wood treatment at least as far back as the 1950's, and was used until 1982. During the period of use, PCP was applied to wood in an oil-based mixture. Commercial grades of pentachlorophenol manufactured during this period contained various isomers of chlorinated dibenzo-dioxins and dibenzo-furans.

Additional chemicals used by J.H. Baxter Company from the beginning of its wood treatment operations in 1962 through the current operations of the treatment facility include ammonical copper-zinc-arsenate (ACZA), creosote, 50/50 (a 50:50 petroleum creosote mixture), D-blaze, and pyresote. Pyresote, a flame retardant, is a mixture of zinc chloride, sodium dichromate, ammonium sulfate, and boric acid.

Waste disposal, handling, and discharge practices over the 50 years of plant operations have resulted in site soil, groundwater, and surface water contamination by chemicals described in the previous paragraphs. Waste generated at the site include retort drippings, tank and retort sludges, process water, wastewater, drying area drippings, storage area drippings, empty containers, and spilled raw preservative compounds. Prior to 1983, when the facility was ordered to cease its waste disposal practices by the North Coast Regional Water Quality Control Board (NCRWQCB), waste management involved on-site disposal and discharge, spray irrigation of waste water on site, storage in ponds and tanks on site, and possible disposal of sludges into a local landfill. Discharge of wastewater into the bermed area around the 500,000 gallon tank was also reported. Leakage from storage tanks may also have contributed to subsurface contamination.

The following is a chronology of important Baxter/IP/Roseburg site activities and investigations by the potentially responsible parties (PRPs), state agencies, and EPA.

March 1982	NCRWQCB inspected J.H. Baxter and requested report of waste discharge.
November 1982	California Department of Health Services (DHS) inspected J.H. Baxter and reported improper handling and storage of wastes.
December 1982	DHS required J.H. Baxter to begin a surface and groundwater monitoring program.
March 1983	Elevated levels of arsenic, creosote, and pentachlorophenol were discovered by DHS and NCRWQCB in site soils, surface water runoff, and groundwater. Additional soil samples collected in Lincoln Park also showed elevated arsenic. The NCRWQCB issued Cleanup and Abatement Order to J.H. Baxter to cease waste disposal practices.
March 1983	J. H. Baxter installed two monitor wells at the request of DHS and NCRWQCB. Results showed elevated levels of wood treatment chemicals in groundwater.
April 1983	Siskiyou County Health Department temporarily closed Lincoln Park to evaluate soil contamination results.
May 1983	NCRWQCB sampled soil, sediment, and surface water within Lincoln Park, the drainage through the park, and on Baxter property. Results showed that a discharge was occurring and the NCRWQCB issued a Cease and Desist order to J.H. Baxter.
July 1983	J. H. Baxter sampled soil within its sprayfield and reported elevated arsenic.
September 1983	DHS cited Baxter for violation of an interim hazardous waste facility permit and the State Hazardous Waste Control Laws.

January 1984	NCRWQCB advised J.H. Baxter of continued non-compliance with existing orders.
February to September 1984	NCRWQCB and DHS met with J.H. Baxter regarding remedial investigations and waste discharge requirements.
October 1984	EPA proposed the J. H. Baxter site for the National Priorities List (NPL).
July 1985	DHS held public meetings to discuss addition of the site to the State Superfund List.
September 1985	The NCRWQCB issued Cease and Desist Orders to J.H. Baxter, IP, and Roseburg requiring that the companies submit a plan for investigating and cleaning up groundwater and surface water.
December 1985	NCRWQCB issued Cease and Desist Order to J.H. Baxter, IP, and Roseburg to implement investigation work plan.
January 1986	Site formally included on State's Priority Ranking List.
January 1986	EPA became the lead agency for site remedial studies and enforcement.
January to September 1986	EPA attempted to negotiate consent decree with the PRPs for conduct of the RI/FS.
September 1986	Consent Decree negotiations failed and EPA prepared for EPA-sponsored RI/FS.
March 1987	EPA initiated a Remedial Investigation (RI). The RI Report was released in January 1989.
Late 1987/ Early 1988	The California Department of Fish and Game conducted a fisheries study of Beaughton Creek above and below the site. The Fish and Game reported that discharges from the site had adversely affected aquatic life downstream of the site.

December 1988	NCRWQCB issued Cease and Desist Orders to J.H. Baxter and Roseburg to address surface runoff violations and TPCA compliance. Cleanup and Abatement Orders issued to IP to implement groundwater remediation program.
May 1989	NCRWQCB issued Waste Discharge Requirements to J.H. Baxter, IP, and Roseburg for groundwater biological treatment feasibility study.
June 1989	The Baxter/IP/Roseburg site was added to the NPL.
April 1990	EPA's Draft Feasibility Study and Proposed Plan were released.

3.0 COMMUNITY RELATIONS

EPA has encouraged public participation during the RI/FS process and has met the requirements for public participation under CERCLA Section 113(K)(2)(B)(i-v). Public participation has occurred through the following activities:

April 1986	Community interviews and meetings with local officials and media regarding EPA's role on the RI/FS.
February 1987	Release of Fact Sheet requesting public comment on the RI work plan. Document repositories established in four locations near the site.
February 1987	EPA sponsored public meeting in Weed to discuss community concerns with RI work plan.
April 1987	Release of EPA Community Relations Work Plan for the site.
June 1988	Public Notice in two local newspapers and release of draft Remedial Investigation Report for public comment.
April 1990	Public notice in two local newspapers and release of draft Feasibility Study report and Proposed Plan for public comment. Comment period extended to 60 days.
May 1990	A formal public meeting in accordance with CERCLA Section 117 (a)(2) was held on May 7, 1990 to discuss FS and Proposed Plan. No public opposition voiced. Main concern expressed was to maintain plant operations and economic viability of community.

EPA has prepared the attached response summary which provides EPA's responses to comments submitted in writing during the public comment period, and to comments that were presented during the May 7 public meeting (See Appendix A).

4.0 SCOPE AND ROLE OF RESPONSE ACTIONS

The selected response actions address contamination in soil, groundwater, and surface water caused by operations at the Baxter/IP/Roseburg site. The response actions will be performed to meet the final site treatment standards exhibited in Table 4-1. These levels are based on Applicable or Relevant and Appropriate Requirement (ARAR) considerations and health protection criteria. The contaminant-specific ARAR considerations for groundwater treatment and release of treated water as process water on the log decks, to percolation/evaporation ponds, and reinjection into the contaminated aquifer are presented in Table 4-2. Health protection criteria for the soils remedies are presented in Table 4-3.

For the site, arsenic, carcinogenic polycyclic aromatic hydrocarbons (PAHs), pentachlorophenol, and dioxins have been identified as the primary contaminants of concern. All of these contaminants are known or suspected carcinogens and are present in each medium at concentrations exceeding health standards. Chromium, copper, zinc, benzene, and noncarcinogenic PAHs have been identified as contaminants of less concern. These contaminants are present at levels below health-based standards, are not widespread, or are considered to be less toxic than the primary site contaminants.

The selected remedies presented herein address the documented potential threats from the site. Treatment of the contaminated soil and groundwater will significantly reduce the potential for future exposure to contaminated soil, groundwater, surface water, particulates, and vapor. Because all remedies will reduce contamination to either background, non-detection based on current accepted analytical methods,[1] or to a 10^{-6} risk level, the point of compliance will be achieved when all contaminants are treated to the standards identified in this ROD.

Soil Contamination

Contaminated soils have been divided into areas based on contamination levels and types of chemicals present in the soils. The remedy selected for soils is specific to each area and the type of contamination present (Figure 4-1).

With regards to dioxins and furans in the soils, the remedy will reduce contamination to levels specified by the Agency for Toxic Substances and Disease Registry (ATSDR), consistent with

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[1] Non-detection based on EPA's Test Methods for Evaluating Solid Waste (SW-846) procedures. Minor procedural modification may be necessary to allow practical quantification of results.

TABLE 4-1

CONTAMINANT CONCENTRATIONS AND CLEAN-UP STANDARDS

Contaminant	Average Site Levels	Maximum Site Levels	Clean-up Standards
SURFACE SOILS	(ppm)	(ppm)	(ppm)
Arsenic	240	38,500	8
Chromium	130	45,000	500
Copper		37,100	2,500
Zinc		58,400	5,000
Pentachlorophenol	9	2,440	17
Carcinogenic PAHs[b]	6	2,600	0.51[a]
Dioxins	0.0035	5.7	0.001
Furans	0.002	0.98	0.001
SUBSURFACE SOILS/ FIXED SOIL LEACHATE	(ppm)	(ppm)	Leachate Limits (ppm)
Arsenic	21	12,100	5
Chromium	12	1,350	5
Copper	11	604	25
Zinc	40	1,120	250
Pentachlorophenol	160	1,300	1.7
Carcinogenic PAHs	18	420	0.005[a]
Noncarcinogens PAHs[c]	30	6,100	0.15
Dioxins	0.0035	5.7	.001
SEDIMENT	(ppm)	(ppm)	(ppm)
Arsenic	60	353	8
Chromium	33	216	18
Zinc	170	1,750	26
Carcinogenic PAHs		54	0.5[a]
Noncarcinogens PAHs		220	0.5[a]
Pentachlorophenol		11	1.0[a]
Tetrachlorophenol		35	1.0[a]

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TABLE 4-1

CONTAMINANT CONCENTRATIONS AND CLEAN-UP STANDARDS

Contaminant	Average Site Levels	Maximum Site Levels	Clean-up Standards
GROUNDWATER/TREATED WATER DISCHARGE LIMITS	(ppb)	(ppb)	(ppb)
Arsenic	37	1,740	5
Chromium	13	122	8
Copper		37,100	11
Zinc	170	23,000	90
Benzene	8	170	1[a]
Pentachlorophenol	2	210	2.2[a]
Carcinogenic PAHs	360	6,000	5[a]
Noncarcinogens PAHs	635	251,800	5[a]
Dioxins	12	13	0.000025[a]

a Analytical detection limit.

b Carcinogenic PAHs: Benzo(a)anthracene, Chrysene, Benzo(b)-fluoranthene, Benzo(a)pyrene, Benzo(k)fluoranthene, Indeno-(123-cd)pyrene.

c Non-carcinogenic PAHs: Naphthalene, 2-Methylnaphthalene, Acenaphthylene, Acenaphthene, Dibenzofuran, Fluorene, Phenanthrene, Anthracene, Fluoranthene, Pyrene, Benzo-(g,h,i)perylene.

TABLE 4-2

COMPARISON OF TREATMENT STANDARDS WITH
ARAR LEVELS FOR WATER (ppb)

Contaminant	Federal MCLGs	Federal MCLs	State MCLs	State AALs	Risk Level	Site Background Level	Site Treatment Standard
Arsenic	50	50	50	74	0.15[a]	<1	5[d]
Chromium	120	50	50	51	180[a]	8	8
Copper	1,300	1,000	1,000	4	1,300[b]	7	11
Zinc	NE	1,000	1,000	26	7,000[b]	90	90
Pentachlorophenol	0	200	NE	2.2	180[a]	0	2.2[d]
PAHs-carcinogenic	NE	NE	NE	NE	0.025[a]	0	5[d]
PAHs-noncarcinogenic	NE	NE	NE	NE	14,000[b]	0	5[d]
Benzene	0	5	1	0.7	10[a]	0	1
Dioxin	NE	NE	NE	NE	0.0000019[a]	0	[c]

[a]Risk level reflects a 1 x 10^{-6} risk level for carcinogens.
[b]Risk level reflects reference dose level for non-carcinogens.
[c]Value= 0.000025 ppb
[d]Analytical quantification limit
NE = None Established
MCLGs = Maximum Contaminant Level Goals
MCLs = Maximum Contaminant Levels
AAL = Applied Action Levels (California)

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TABLE 4-3

COMPARISON OF EXCAVATION STANDARDS
RISK LEVELS FOR SOILS
(ppm)

Contaminant	Soil Concentration Risk Level: Current Workers	Future Children	Future Adults	Soil Background	Soil Excavation Standard
Arsenic[a]	17	0.89	13	8.4	8
Chromium[a]	5,320	570	13,000	40.3	500[c]
Copper[b]	39,000	4,200	94,000	13	2,500[c]
Zinc[b]	210,000	23,000	510,000	88.3	5,000[c]
Pentachlorophenol[a]	1,100	74	840	0	17[c]
Tetrachlorophenol[b]	20,000	2,800	49,000	0	2,800[d]
PAHs-carcinogenic[a]	5.7	0.51	4.5	0	0.51
PAHs-noncarcinogenic[b]	43,000	100,000	1,000,000	0	43,000[d]
Dioxins[a]	0.00072	0.000051	0.00058	0	0.001

[a]Risk level reflects a 1 x 10^{-6} risk level for carcinogens
[b]Risk level reflects reference dose level for non-carcinogens
[c]Excavation standard reflects California Title 22 waste designation level for Chromium, Copper, Zinc, and Pentachlorophenol
[d]EPA TCLP leachate concentration cannot exceed 1 ppm for PAHs and 1 ppm for Tetrachlorophenol for groundwater protection considerations.

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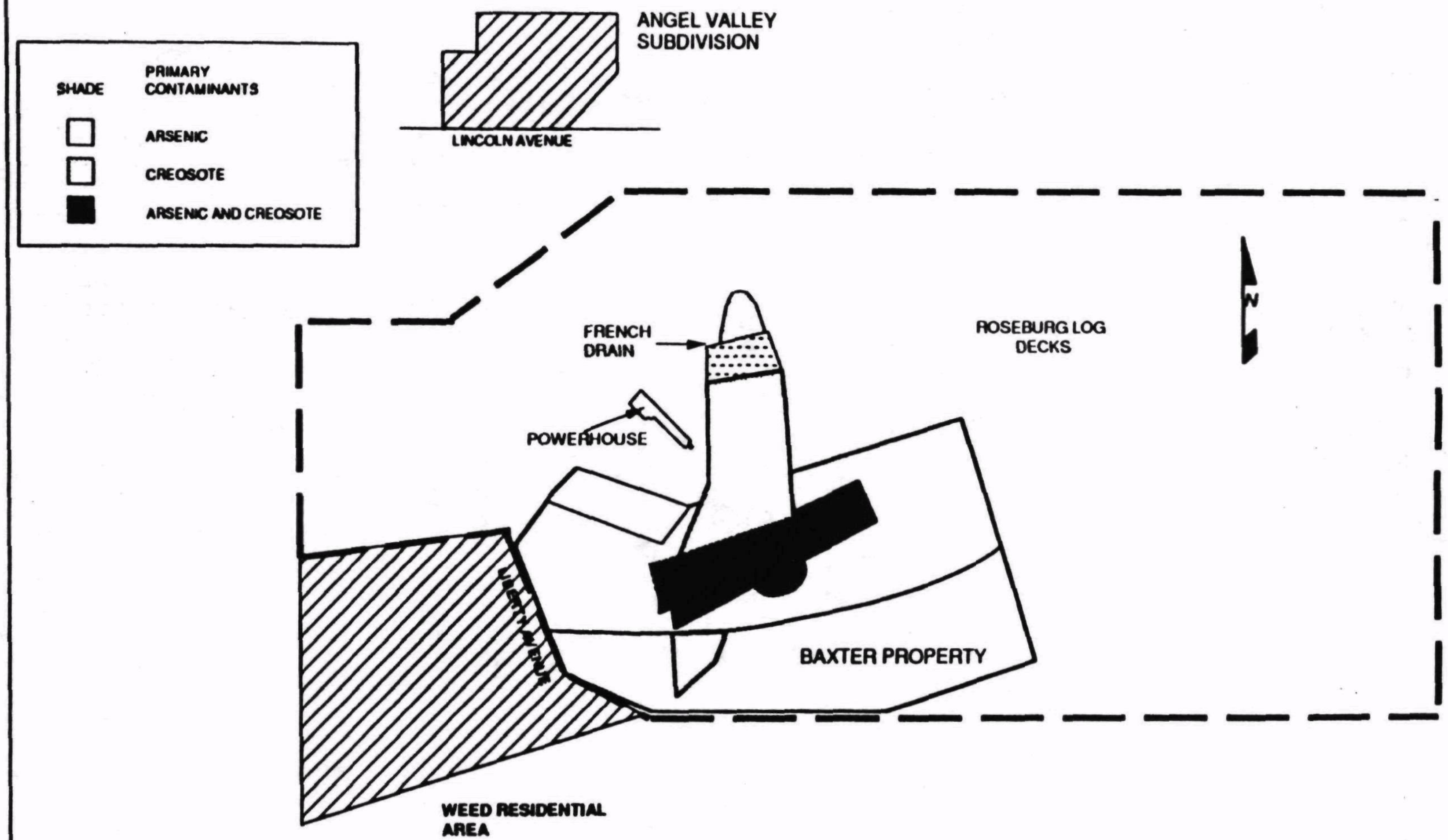


B/IP/R Site - Weed, CA	Approximate Extent of Contaminated Soils	Figure
. EPA		4-1

potential future residential exposure to these soils. For arsenic and carcinogenic PAHs in soils, the remedy will reduceuncontrolled contamination to background levels and non-detect, respectively. Background at 8 ppm is the standard for arsenic. For carcinogenic PAHs, 0.5 ppm, the analytical detection limit, has been selected. These levels reflect a 1×10^{-5} risk level for arsenic and 1×10^{-6} risk level for carcinogenic PAHs. Other soil contaminants will be removed and treated to address EPA's Toxicity Characteristic Leachate Procedure (TCLP) standard, and California CCR Title 22 total threshold limit concentrations (TTLC) and soluble threshold limit concentrations (STLC) standards. These standards are listed in Tables 4-1 and 4-3. Non-carcinogenic PAHs will be excavated to a level that limits the soil leachate concentration to 1 ppm total PAHs in the leachate.

Near surface soils (i.e., all soils greater than 2 feet in depth and to a depth of approximately 12 feet or to the top of groundwater table) will be excavated to remove all soils exceeding California Title 22 TTLC and STLC criteria for metals and pentachlorophenol, leachable carcinogenic PAHs to 0.005 ppm, and leachable non-carcinogenic PAHs to 0.15 ppm.

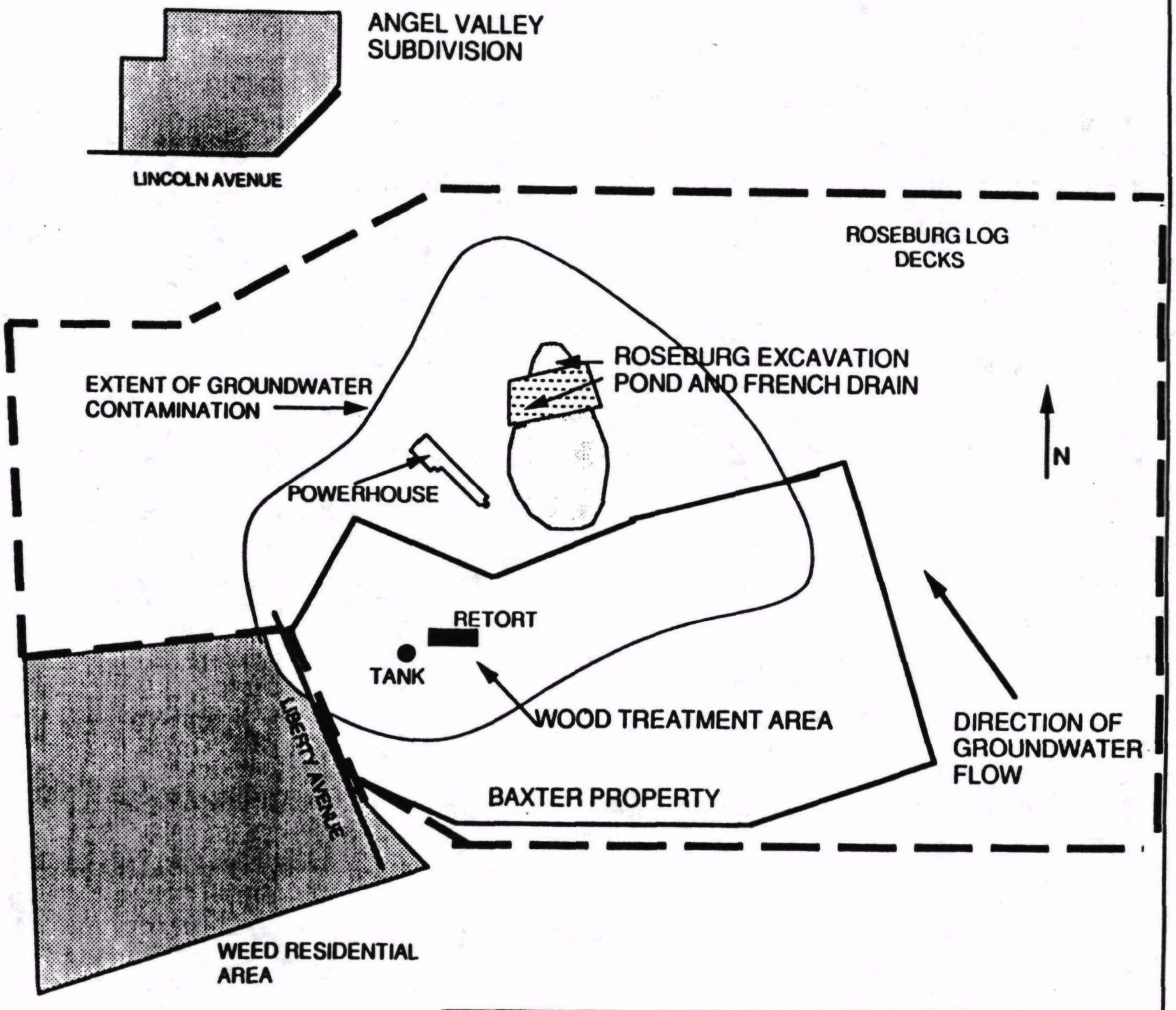
Groundwater Contamination

Contaminated groundwater extends from below the wood treatment area towards the northwest approximately 1,000 feet. A separate body of creosote product also exists below the wood treatment property (Figure 4-2).

For arsenic, EPA's proposed standard for the affected aquifer is 5 ppb which reflects a 1×10^{-5} risk level and the practical quantification limit for arsenic. Pentachlorophenol has a proposed standard of 2.2 ppb which reflects the California Applied Action Level and the practical quantification limit for this contaminant. This level of 2.2 ppb considers pentachlorophenol a carcinogen and represents the 1×10^{-6} risk level as established by the State.

The 1×10^{-6} risk level for carcinogenic PAHs, as established by the site Endangerment Assessment, is 0.025 ppb. This level reflects EPA's goal for the aquifer. However, the analytical quantification limit for PAHs in water is approximately 5 ppb, which is EPA's current standard. Should analytical methods be developed which reduce the quantification limit below 5 ppb, EPA will reduce the carcinogenic PAH standard to the new level to be more consistent with EPA's goals for the aquifer.

For benzene, the remedy will clean up the aquifer to 1 ppb (benzene) which reflects a one in a one million excess cancer threat. For non-carcinogenic PAHs, chromium, copper, and zinc, the remedy will clean up to background levels to be consistent



B/IP/R Site - Weed, CA	Approximate Extent of Groundwater Contamination	Figure
U.S. EPA		4-2

with the NCRWQCB's Basin Plan. Dioxins were detected in the oily-phase material extracted from contaminated groundwater, but not in the groundwater itself, at a detection limit of about 1 part per trillion. Because detection at the 1 x 10^{-6} risk level of 2 parts per quadrillion is currently not achievable, thegroundwater and surface water remedy will treat dioxins and furans to the currently available detection limit of 25 parts per quadrillion. Eventually, it may be possible to detect dioxins and furans at levels as low as our health-based clean-up goal of 2 parts per quadrillion (1 x 10^{-6} risk), and cleanup will extend to this standard at that time.

All treated groundwater intended for release to reinjection wells, percolation/evaporation ponds, or the log deck sprinkler system initially will be treated to health-based standards presented in this ROD. Final treatment standards will reflect the aquifer clean-up standards.

Surface Water and Sediments

EPA is not proposing a remedy for Beaughton Creek sediments at this time. Recent surveys of the creek indicate that the fishery is recovering and a remedy may be more harmful to the fishery if implemented. EPA proposes to continue to sample Creek sediments and aquatic biota in coordination with California Fish and Game, the Regional Board, Department of Health Services and the Potentially Responsible Parties. Any detectable wood treatment chemicals in sediments or fish tissue would warrant continued investigations of the Creek, regardless of levels reported. Should concentrations of wood treatment chemicals remain in sediments at levels deemed by EPA and the State to pose a significant risk to human health and the environment, a Beaughton Creek remedy will be proposed and implemented. The criteria used for the sediment remedy will be developed based on results of the creek studies in coordination with the State.

To protect the creek, EPA is proposing to remove from site drainages leading to the creek all sediment containing detectable or above-background concentrations of site chemicals. Removal of sediments to these standards is necessary to be consistent with the NCRWQCB's Basin Plan.

5.0 SUMMARY OF SITE CHARACTERISTICS

Waste disposal, handling, and discharge practices over more than 50 years of plant operation have resulted in site soil, groundwater, surface water, and sediment contamination. In 1983, the North Coast Regional Water Quality Control Board (NCRWQCB) ordered the facility to cease its waste disposal practices. Prior to 1983, waste management involved on-site disposal in unlined pits or bermed areas, discharge into ditches leading to Beaughton Creek, spray irrigation of process water onsite, storage in ponds and tanks onsite, and possible off-site disposal of sludges into a local landfill. Discharge of wastewater into the bermed area around the 500,000-gallon tank (No. 3 tank) was reported to have occurred. Leakage from storage tanks may also have contributed to subsurface contamination.

For the site, arsenic, carcinogenic PAHs, pentachlorophenol, and dioxins have been identified as the primary contaminants of concern. All of these contaminants are known or suspected carcinogens and are present in each medium at concentrations exceeding health standards. Therefore these contaminants are considered principle health threats. Chromium, copper, zinc, benzene, and non-carcinogenic PAHs have been identified as contaminants of less concern and are considered low-level threat contaminants. These contaminants are present at levels below health-based standards, are not widespread, or are considered to be less toxic than the primary site contaminants.

5.1 GROUNDWATER

Groundwater sample results showed the presence of a creosote and arsenic plume, originating at the Baxter wood treatment area and extending to the northwest into the Roseburg property towards the Angel Valley subdivision (Figures 1-3 and 4-2). This subdivision includes an estimated 108 households. Several domestic wells used for household and yard watering are present in the subdivision and are less than 2,000 feet downgradient of the sources of groundwater contamination. EPA has notified all residences in the area of the potential for groundwater contamination. To EPA's knowledge, no-one is currently using the domestic wells as a primary source of drinking water.

Arsenic at 1,740 ppb and creosote compounds at 233,000 ppb were detected in Roseburg monitor well RMW1, which was located immediately downgradient of the wood treatment property and 1,600 feet upgradient of the subdivision. A portion of this arsenic and creosote plume is being captured by the Roseburg french drain. According to the RI Report and December 1989 monitoring data, wells downgradient of the french drain and adjacent to and within the subdivision did not show the presence of site contaminants.

5.2 SOIL

Results of surface soil samples collected across the wood treatment property indicated widespread arsenic contamination (40 to 38,500 ppm) to a depth of at least one foot. The majority of surface soil samples collected contained in excess of 100 ppm arsenic. Arsenic contamination extended deeper (up to 5 feet) below the retort, wastewater impoundments, and tank-bermed areas of the property. Contamination of surface soils by creosote (N.D. to 10,384 ppm) and pentachlorophenol (N.D. to 2,440 ppm) was less widespread than the inorganic contamination, but much deeper. Organic contamination below the tank berm, retort, and wastewater vault areas extends to at least 30 feet below ground surface. A subsurface creosote body of up to 15 feet in thickness exists under the wood treatment property. The remaining creosote body exists as lenses of 1- to 2-foot thickness that continues through the Roseburg excavation and is partially captured by the Roseburg french drain.

Surface soil samples collected on the Roseburg log deck to the northwest of the wood treatment area contained slightly elevated (up to 78 ppm) arsenic concentrations. The distribution of contamination was toward the northwest, which is a primary wind direction from the site. Elevated concentrations of site contaminants were not detected in any of the subsurface samples collected away from the wood treatment area.

Results of high-volume air particulate (air quality) samples collected off site also showed elevated particulate levels and arsenic concentrations to the northwest (23 to 183 ppm), as compared to the background area (N.D. to 15 ppm).

In 1983, the California Department of Health Services sampled soil from Lincoln Park and sediments within the drainage ditch that flows adjacent to the Park and found elevated levels arsenic and other chemicals related to wood treatment operations. Lincoln Park was closed temporarily while local health officials reviewed the soil data. EPA also sampled soil in Lincoln Park, Angel Valley subdivision, and the site drainage ditch during the overall site remedial investigation. EPA found elevated arsenic and other wood treatment chemicals in the ditch that flows adjacent to the Park. The arsenic levels that EPA detected ranged between 50 and 95 ppm, which is above the 8 ppm level that EPA considers as naturally occurring in these soils.

Recently, EPA conducted a more extensive sampling effort of soils in residential areas around the Baxter property, including Lincoln Park, Angel Valley Subdivision, and the Liberty Street area adjacent to the Baxter property. Results of this study showed that wood treatment chemicals are not present in residential areas at levels above background, with one exception. Chromium was detected at 82 ppm in Lincoln Park, which is above the background level of 40 ppm. However, this result is far below the 1 x 10^{-6} risk level for direct contact to children, which is 570 ppm.

5.3 SURFACE WATER AND SEDIMENTS

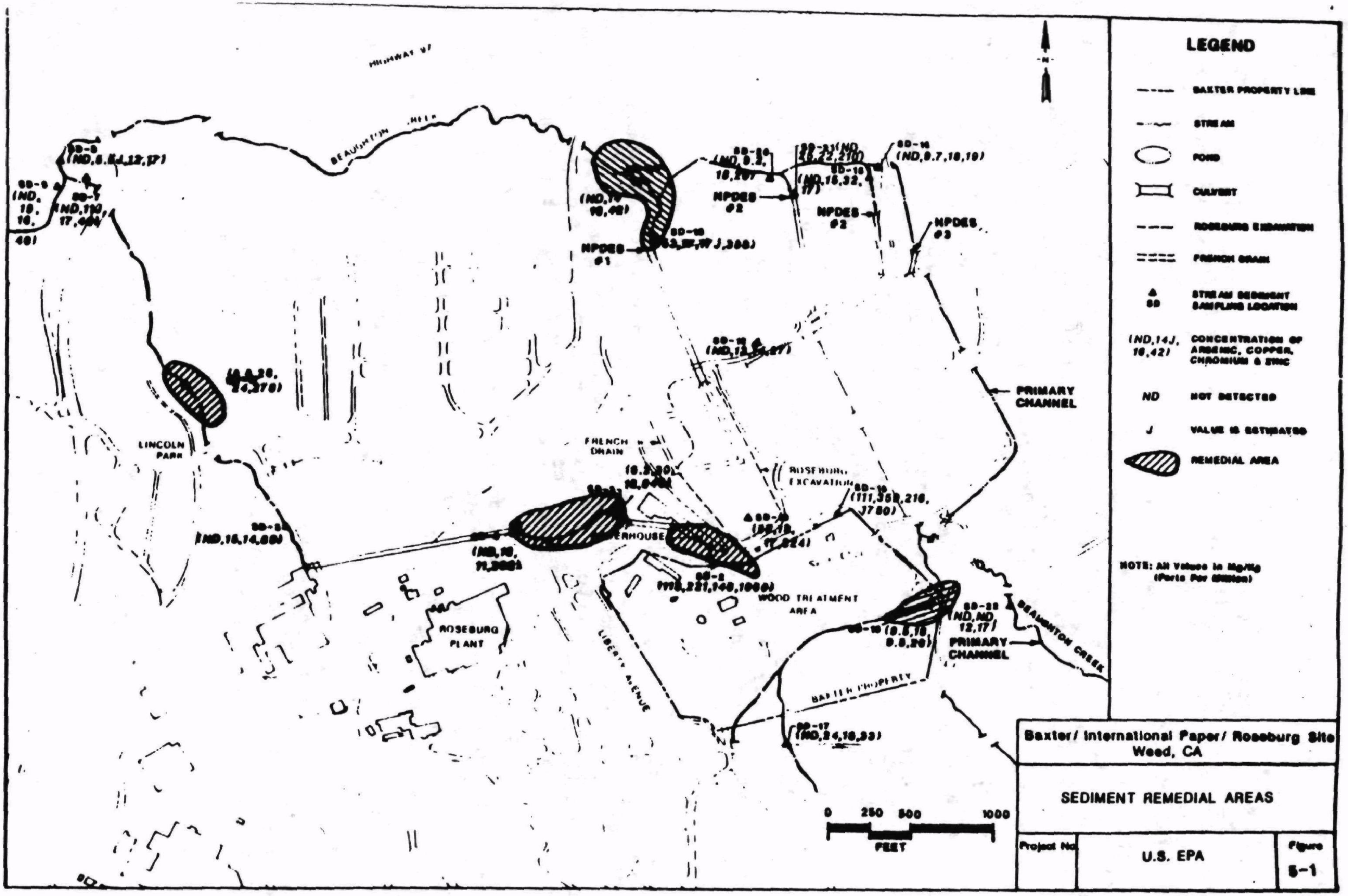
Beaughton Creek, the main surface water body for the site, originates from springs located 3,000 feet upgradient of the Baxter property. The stream flows directly through the site in a northwest to west direction. All major and minor site stormwater/surface runoff drainages eventually flow into the creek, either on the site, or immediately downgradient of the site.

Surface water analyses revealed that releases of site chemicals were occurring from the Baxter wood treatment area. Elevated arsenic (552 ppb) was detected in a sample collected from a drainage that receives a portion of the runoff from the wood treatment facility. Elevated arsenic was detected throughout the drainage to its confluence with Beaughton Creek. Arsenic and creosote in contaminated groundwater captured by the Roseburg french drain were also being released to Beaughton Creek at the NPDES #1 discharge point. This release was abated when Roseburg installed a water treatment facility to remove organics from water extracted from the french drain and then pumping the treated waters into the their log deck sprinkler system (Figure 5-1).

Over the years there have been several releases of wood treatment chemicals into Beaughton Creek resulting in fish kills. The most recent release in November 1987 was of creosote from NPDES #1 discharge point. The California Department of Fish and Game remains concerned over the impacts to the fishery and potential effects upon anglers consuming the fish.

Remedial Investigation results indicated that sediments within two channel segments contain elevated concentrations of wood treatment chemicals at levels of environmental and human health concern. These segments include a 50-foot long stretch of the site drainage, immediately north of the Baxter property, and a 100-foot segment of Beaughton Creek at the confluence with the Roseburg NPDES #1 discharge point (Figure 5-1).

Analysis of stream sediment samples indicated elevated arsenic (113 ppm) within the drainage that receives runoff from the wood treatment property. Sediment throughout the site area was also contaminated with tetrachlorophenol (35 ppm), a compound associated with pentachlorophenol. Stream sediment downgradient


LEGEND
POND
CULVERT
FRENCH DRAIN
(ND,14J, 18,42)
CONCENTRATION OF ARSENIC, COPPER, CHROMIUM & ZINC
ND
NOT DETECTED
J
VALUE IS ESTIMATED
REMEDIAL AREA
PRIMARY CHANNEL
LINCOLN PARK
FRENCH DRAIN
ROSEBURG EXCAVATION
WOOD TREATMENT AREA
ROSEBURG PLANT
LIBERTY AVENUE
BEAUGHTON CREEK
NPDES #1
NPDES #2
NPDES #3
0 250 500 1000
FEET
Baxter/ International Paper/ Roseburg Site
Weed, CA
SEDIMENT REMEDIAL AREAS
Project No.
U.S. EPA
Figure
5-1

of the NPDES #1 discharge was visibly contaminated with creosote (1987 observation).

5.4 CONCLUSION

EPA's remedy for soil cleanup will involve approximately 41,000 cubic yards of soil. This includes 18,750 cubic yards of soil contaminated with inorganics only, 12,500 cubic yards of soil contaminated with organics only, and 9,380 cubic yards of soil contaminated with both inorganic and organic chemicals. EPA expects that up to 150,000 gallons of contaminated groundwater may need to be treated each day for approximately 30 years. Soil and groundwater treatment remedies should be adequate to prevent surface water releases and a surface water remedy is not proposed at this time. EPA will coordinate existing and future environmental study results with the California Department of Fish and Game to determine the necessity for any action regarding sediments.

Site-related chemicals, the media affected, and the current corresponding concentration ranges are given in Table 5-1. All data used by EPA to develop the Feasibility Study, to select remedial alternatives and to develop conclusions and clean-up standards presented in this Record of Decision were based on the following data quality requirements.

1. All data were collected under the guidance of a Quality Assurance Project Plan developed under EPA protocols and reviewed and approved by EPA Quality Assurance Management staff.

2. All data were collected in accordance with procedures presented in Sampling and Analysis Plans, one plan developed for each discrete sampling episode. The Sampling and Analysis Plans were developed in accordance with EPA Region 9 guidance and were reviewed and approved by EPA Quality Assurance Management staff.

3. With the exception of air quality samples, all soil and groundwater samples were analyzed by an EPA Contract Laboratory Program Laboratory using CLP analytical methods. Air quality samples were analyzed by an EPA CLP laboratory using non-CLP methods. CLP methods do not exist for the analysis of air quality samples.

4. All analytical data collected by EPA, including air quality samples, were subject to data validation in accordance with EPA data validation procedures. Only those data that met the data validation criteria for this site were used in development of the Record of Decision.

TABLE 5-1

SITE RELATED CHEMICALS IDENTIFIED IN ENDANGERMENT ASSESSMENT
AS POTENTIALLY POSING THE GREATEST THREATS
TO HUMAN HEALTH AND THE ENVIRONMENT

Chemical	Media Affected[a]	Frequency of Detection	Concentration Range[b]
Arsenic	Groundwater	52/143	<3 - 1,740 ppb
	Surface Water	50/94	<3 - 558 ppb
	Soils	102/199	<0.46 - 38,500 ppm
	Sediment	15/31	<6 - 113 ppm
Benzene[c]	Groundwater	11/72	<0.8 - 180 ppb
	Surface Water	1/55	<0.8 - 9 ppb
	Soils	1/84	<5. - 10 ppm
Chromium	Groundwater	26/143	<4.0 - 164 ppb
	Surface Water	33/94	<4.0 - 19 ppb
	Soils	196/199	<2.2 - 45,000 ppm
	Sediment	31/31	<9.0 - 148 ppm
Copper	Groundwater	51/143	<5.0 - 137 ppb
	Surface Water	50/94	<4.0 - 52 ppb
	Soils	199/199	<1.8 - 37,100 ppm
	Sediment	30/31	<1.8 - 359 ppm
Ethylbenzene[c]	Groundwater	11/72	<0.5 - 360 ppb
	Surface Water	2/55	<0.8 - 73 ppb
	Soils	5/84	<5.0 - 450 ppm

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TABLE 5-1

SITE RELATED CHEMICALS IDENTIFIED IN ENDANGERMENT ASSESSMENT
AS POTENTIALLY POSING THE GREATEST THREATS
TO HUMAN HEALTH AND THE ENVIRONMENT (cont.)

Chemical	Media Affected[a]	Frequency of Detection	Concentration Range[b]
Carcinogenic PAHs	Groundwater	20/153	< 5 - 6,000 ppb
	Surface Water	12/51	<10 - 15 ppb
	Soils	23/131	<0.074 - 2,600 ppm
	Sediment	15/47	<0.060 - 54 ppm
Non-Carcinogenic PAHs	Groundwater	49/123	<50 -251,800 ppb
	Surface Water	23/52	<10 - 1,632 ppb
	Soils	34/131	<0.048 - 10,384 ppm
	Sediment	9/47	<0.060 - 220 ppm
Pentachlorophenol	Groundwater	55/157	0.06 - 30 ppb
	Surface Water	14/88	<1.0 - 3.0 ppb
	Soils	13/131	<0.26 - 2,440 ppm
	Sediment	1/47	<3.2 - 11.0 ppm
Dioxins/[d]	Soil	27/28	<0.001 - 14.1 ppm
Furans	Soil	21/28	<0.001 - 0.989 ppm
	Sediment	12/20	
Tetrachlorophenol	Groundwater	47/157	0.003 - 11 ppb
	Surface Water	12/88	<0.06 - 0.90 ppb
	Soils	9/130	<1 - 510 ppm
	Sediment	8/47	<0.290 - 35 ppm

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TABLE 5-1

SITE RELATED CHEMICALS IDENTIFIED IN ENDANGERMENT ASSESSMENT
AS POTENTIALLY POSING THE GREATEST THREATS
TO HUMAN HEALTH AND THE ENVIRONMENT (cont.)

Chemical	Media Affected[a]	Frequency of Detection	Concentration Range[b]		
Zinc	Groundwater	101/103	<5	- 19,200	ppb
	Surface Water	70/93	<4.4	- 6,940	ppb
	Soils	199/199	<4	- 58,400	ppm
	Sediment	31/31	<16	- 1,060	ppm

5-8

[a]Only the media with concentrations of chemicals exceeding health criteria are presented here.
[b]Lower value reflects the lowest concentration detected and should be used as the lower limit for background. The upper value in the range reflects the maximum concentration detected during EPA's RI.
[c]Benzene and ethylbenzene are associated with a former underground fuel tank and are not considered widespread contaminants.
[d]TCDD equivalents: Dioxins: <0.001 - 5.71; Furans: <0.001 - 0.333.

Source: Baxter/IP/Roseburg Feasibility Study, April 1990.

5. EPA reviewed data collected by the State and Potentially Responsible Party contractors for use in defining nature and extent of contamination at the site. Only the data that were documented with the identity of the sampler, sampling date, sample location, sampling methods, identity of analytical laboratory, analytical method, and original laboratory results were incorporated into EPA's analysis.

6.0 SUMMARY OF SITE RISKS

EPA prepared an Endangerment Assessment to document the potential risks associated with the actual or threatened releases of hazardous substances from the Baxter/IP/Roseburg site. The following paragraphs summarize the information found in this document (U. S. Environmental Protection Agency, April 30, 1990. Endangerment Assessment, Baxter/IP/Roseburg (BIPR) Site, Weed, California, Volumes 1 and 2, EPA WA 205-9L74).

6.1 HEALTH RISKS

The risk assessment identified chemicals of concern for human receptors. The chemicals were selected primarily on the basis of the concentration detected, or the known or suspected toxicological properties of the substance. The wood treatment inorganic (metal) chemicals of concern include arsenic, chromium, copper, and zinc, with arsenic being identified as a high threat contaminant. The organic chemicals of concern include carcinogenic and non-carcinogenic PAHs, pentachlorophenol, tetrachlorophenol, chlorinated dibenzo dioxins and chlorinated dibenzo furans. Carcinogenic PAHs, pentachlorophenol, and dioxins have been identified as high threat contaminants. The organic compounds benzene, ethylbenzene, toluene, and xylene (possibly present due to a former underground storage tank) were also identified as chemicals of concern.

To assess risks, cancer potency factors $(mg/kg/day)^{-1}$ of 2.9×10^{-2} for benzene, 1.6×10^{-2} for pentachlorophenol, 1.56×10^{5} for carcinogenic PAHs, and 2 for arsenic were used. Reference Dose (RfD; mg/kg/day) of 5×10^{-3} for chromium (VI), 3.7×10^{-2} for copper, 2×10^{-1} for zinc, and 4×10^{-1} for non-carcinogenic PAHs were used. Assumptions used for soil exposure assessment included an exposure frequency of 240 days/year, ingestion rate of 100 mg/day, and a lifetime exposure of 70 years. Assumptions used to assess groundwater exposure included ingestion of 2 liters of water per day for 70 years and exposure at a frequency of 365 days per year.

The chemicals of concern were each detected in at least one environmental medium (soils, air, groundwater, surface water, and/or sediments) in the vicinity of the site. Several of the contaminants (benzene, certain PAHs, PCDDs/ PCDFs, pentachlorophenol) have been shown to be carcinogenic in animals and have been classified by EPA as possible or probable human carcinogens; arsenic is a known human carcinogen. The non-carcinogenic contaminants have been observed to have toxic potentials based on laboratory studies and effects on humans under certain exposure situations.

Table 6-1 presents the contaminants of concern with respect to the media in which they are found. Table 5-1 depicts the concentrations of the chemicals of concern upon which the risk assessment was based.

The evaluation performed under the risk assessment indicated that, under current land-use conditions, the principal exposure pathways by which human receptors could potentially be exposed to site contaminants are direct contact by workers at the Baxter facility with contaminated soils, direct contact by children with contaminated off-site soils (Lincoln Park and Angel Valley subdivision), inhalation of fugitive dust emissions on and off site, and direct contact with surface water and sediments near Lincoln Park. Within the risk assessment, the exposure point concentrations of site chemicals were estimated using measured concentrations or models to estimate fugitive dust emissions.

Exposure was assessed for both an average case and a maximum plausible case for each exposure scenario. For the average case, geometric mean concentrations were used, together with what were considered to be the most likely exposure conditions. For the maximum plausible case, the highest measured concentrations were generally used, together with high, although plausible, estimates of the range of potential exposure parameters relating to frequency and duration of exposure and quantity of contaminated media contacted.

The risk assessment evaluated two main baseline (No Action) scenarios: continued use of the property as industrial (wood treatment) and future-use development of the property as residential. A summary of risks posed by site chemicals for current-use conditions assuming no cleanup has occurred is presented in Table 6-2. A summary of risks posed by site chemicals for future-use conditions, assuming no cleanup has occurred is presented in Table 6-3.

As Table 6-2 illustrates, the highest current-use potential health risk due to arsenic, PAHs, and dioxin is exposure by workers at the Baxter Facility to the soil by direct contact (Plausible Maximum Case risk of 8×10^{-2}). Total maximum risk to site workers from all contaminants and pathways is 1.4×10^{-1}. The maximum non-carcinogenic risks from direct contact with soil by workers at the Baxter Facility exceeds a hazard index of 1. Inhalation of arsenic-contaminated fugitive dust by adults living in the area of Union Street poses a current-use maximum potential excess cancer risk of 2×10^{-2}. The corresponding maximum non-carcinogenic risk from inhalation by Union Street adults does not exceed a hazard index of 1.

Higher health risks are associated with future residential use of the site (see Table 6-3). Children in direct contact with Baxter soil have a maximum excess cancer risk of 1×10^{-1} due to

TABLE 6-2

SUMMARY OF RISKS FOR CURRENT-USE CONDITIONS AT THE BIPR SITE

POPULATION	POTENTIAL UPPER BOUND EXCESS CANCER RISK[a]		NON-CARCINOGENIC[b] HAZARD INDEX CDI:RfD RATIO	
	AVERAGE	PLAUSIBLE MAXIMUM	AVERAGE	PLAUSIBLE MAXIMUM
CURRENT-USE				
Workers at the Baxter Facility				
Direct contact with soil	$2x10^{-5}$	$8x10^{-2}$	<1	>1
Inhalation of fugitive dust	$2x10^{-5}$	$6x10^{-2}$	<1	<1
Workers at the Roseburg Facility				
Direct contact with soil	$5x10^{-5}$	$5x10^{-3}$	<1	<1
Inhalation of fugitive dust	$2x10^{-5}$	$6x10^{-2}$	<1	<1
Children Living in the area				
Direct contact with soil				
Angel Valley	$1x10^{-5}$	$6x10^{-5}$	<1	<1
Lincoln Park	$1x10^{-5}$	$3x10^{-4}$	<1	>1
Direct contact with surface water and sediments	$2x10^{-7}$	$9x10^{-6}$	<1	<1
Adults Living in the area				
Inhalation of fugitive dust				
Liberty Street	$4x10^{-4}$	$6x10^{-3}$	<1	<1
Union Street	$9x10^{-4}$	$2x10^{-2}$	<1	<1

[a]A $1x10^{-6}$ (one in one million) level is EPA's risk reduction target.
[b]RfD definition: RfD is reference dose toxicity level for non-carcinogens.

BAXROD6-2

TABLE 6-3

SUMMARY OF FOR FUTURE-USE CONDITIONS
AT THE BIPR SITE

POPULATION	POTENTIAL UPPER BOUND EXCESS CANCER RISK[a]		NON-CARCINOGENIC[b] HAZARD INDEX CDI:RfD RATIO	
	AVERAGE	PLAUSIBLE MAXIMUM	AVERAGE	PLAUSIBLE MAXIMUM
<u>FUTURE-USE</u>				
<u>Adults</u>				
Direct contact with soil				
Baxter	$2x10^{-5}$	$6x10^{-2}$	<1	>1
Roseburg	$6x10^{-5}$	$4x10^{-3}$	<1	<1
Ingestion of groundwater	$9x10^{-2}$	$8x10^{-1}$	>1	>1
<u>Children</u>				
Direct contact with soil				
Baxter	$4x10^{-4}$	$1x10^{-1}$	>1	>1
Roseburg	$6x10^{-4}$	$6x10^{-3}$	<1	>1
Ingestion of groundwater	$7x10^{-2}$	$5x10^{-1}$	>1	>1
Inhalation of volatiles released from groundwater	$4x10^{-2}$	$3x10^{-1}$	<1	>1
Direct contact with surface water and sediments	$2x10^{-6}$	$1x10^{-4}$	<1	<1

[a]A 1E-6 (one in one million) level is EPA's risk reduction target.
[b]RfD Definition: RfD is reference dose toxicity for non-carcinogens.

BAXROD6-3

TABLE 6-1

CHEMICALS OF POTENTIAL CONCERN FOR THE BIPR SITE

Compound	Soil				Groundwater		Surface Water			Sediment			Air
	Baxter Property	Roseburg Excavation	Angel Valley	Lincoln Park	Onsite	Offsite	Onsite	Immediately Offsite	Down-stream	Onsite/ Immed. Offsite	Lincoln Park	Down-stream	
Arsenic	x	x			x		x	x		x	x		x
Benzene					x								
Chromium	x			x	x		x	x		x	x		
Copper	x			x	x		x	x		x	x		
Ethyl-benzene	x				x								
Carcino-genic PAHs	x	x			x		x			x	x		
Noncarcino-genic PAHs	x	x	x		x		x			x			
PCDDs/PCDFs	x•	x•								x	x		
Pentachloro-phenol	x				x		x				x		
Tetrachloro-phenol	x				x		x			x	x		
Toluene	x	x•			x					x			
Xylenes	x				x								
Zinc	x	x•		x	x		x	x		x	x		

• Subsurface soil only
• Surface soil only

arsenic, PAHs, and dioxins. The future risk to children for consumption of contaminated groundwater is 5×10^{-1}. Total maximum risk to children from all sources is 6×10^{-1}. The corresponding maximum non-carcinogenic risks from children in direct contact with Baxter soil exceeds a hazard index of 1. Adults in direct contact with Baxter soil have a maximum excess cancer risk of 6×10^{-2} due to arsenic, carcinogenic PAHs, and dioxins. The future risk to adults for consumption of contaminated groundwater is 8×10^{-1}. The total maximum risk to adults from all sources is 8.6×10^{-1}. The corresponding maximum non-carcinogenic risk exceeds a hazard index of 1.

6.2 ENVIRONMENTAL RISKS

Wildlife habitat in the study area includes Beaughton Creek, its tributaries, and woodland and pasture areas immediately adjacent to these surface waters. Wildlife use of the site is expected to be limited because of industrial and residential development. No State or Federal threatened or endangered species are known to reside on or in the vicinity of the site. No critical habitats are known to exist in the vicinity of the site. Man-made and natural wetlands occur within and adjacent to this site.

6.2.1 AQUATIC LIFE

The State of California has developed applied action levels (AALs) for arsenic, chromium, copper, and zinc for the protection of aquatic life. EPA has developed ambient water quality criteria (AWQC) for the protection of aquatic life for these four metals and for pentachlorophenol. In addition, EPA has identified the lowest-observable-effect level (LOEL) for acenaphthene and fluoranthene for which insufficient data are available to derive AWQC. (AALs, AWQC, and LOELs are referred to collectively as aquatic life toxicity values.) Table 6-4 presents a comparison of the surface water contaminant concentrations detected during the RI with the AWQC and AALs.

The data presented in Table 6-4 show that surface water at the site has the potential to affect aquatic life and may continue to affect aquatic life in Beaughton Creek if the site is not cleaned up. Arsenic at 558 ppb and zinc at 6,940 ppb exceed their respective AALs of 74 ppb and 26 ppb, respectively. These contaminants exceed aquatic life toxicity values greatest in the area nearest the Baxter property, but the contaminants also exceed their AALs at areas closer to the main channel of Beaughton Creek. Potential impacts associated with these other chemicals are expected to be greatest next to the Baxter property, given the greater number and concentrations of chemicals present in this area.

TABLE 6-4

COMPARISON OF SITE SURFACE WATER LEVELS
WITH FEDERAL AWQC AND STATE AALs
(ppb)

Contaminant	Beaughton Creek Levels	Site Drainage Levels	AWQC	AALs
Arsenic	<5	558	0.0022	74
Chromium	<5	19	11.	51
Copper	<5	41	12.	4
Zinc	65	6,940	110.	26
Pentachlorophenol	0	0	13.	2.2
PAHs	0	179	0.0028	0

Abreviations: AWQC = Ambient Water Quality Criteria
AALs = Applied Action Levels (California)

6.2.2 TERRESTRIAL WILDLIFE

Terrestrial wildlife may be exposed to chemicals of potential concern in surface water and sediment by several pathways: (1) ingestion of food that has accumulated chemicals from surface water or sediment; (2) ingestion of surface water; (3) ingestion of sediment while foraging or grooming; and, (4) dermal absorption. However, evaluations of receptor-specific exposures via some of these pathways are limited by the lack of appropriate exposure assessment information. Therefore, the evaluation of potential wildlife exposures and impacts at the Baxter site is limited to an evaluation of potential impacts associated with ingestion of surface water and contaminated food. Potential exposures via either of these pathways are not expected to occur on the Baxter property or immediately adjacent areas because these areas provide little habitat for wildlife. Potential exposures are more likely to occur in off-site areas where habitat has been less disturbed. As a result, it is considered unlikely that wildlife would be exposed to chemicals in the most contaminated areas (i.e., immediately adjacent to the site) and that exposures are more likely to occur in the less-contaminated areas.

Potential impacts from ingestion of surface water in the less contaminated areas are not expected to be significant. Use of Beaughton Creek and its tributaries as a drinking water source by big game, other terrestrial wildlife, and cattle adjacent to the site is expected to be limited. The creek is unlikely to be used as a drinking water source by the small mammals of the area (i.e., rabbit, ground squirrel) because these animals generally obtain much of their daily water from dietary sources; the possible occasional use of these surface waters for drinking water is not expected to result in significant exposure in these species.

Many birds also obtain much of their daily water via the diet; therefore, birds also would be expected to have limited drinking water exposure to chemicals detected in surface water at the site. For those bird species that do supplement dietary water with surface water, some exposures could occur. However, none of the chemicals of potential concern detected in surface water in the less contaminated areas are expected to be acutely or chronically toxic at the low level of exposure potentially experienced by these species. Therefore, wildlife impacts associated with ingestion of surface water from Beaughton Creek are not expected to be significant.

Wildlife may be exposed to chemicals of potential concern in surface water and sediment that have accumulated in food. However, with exception of PAHs, none of the chemicals present in surface water and/or sediment are expected to accumulate to a significant degree in the aquatic food chain. PAHs can exhibit bioconcentration factors than can exceed a factor of 1,000, when comparing ambient concentrations with animal tissue concentrations. Exposure to wildlife feeding near Beaughton Creek is expected to be insignificant given the low concentrations (about 0.5 ppm in sediment) and infrequent occurrence of PAHs in the creek in areas downstream of the Baxter property (i.e., benzo(a)pyrene was the only PAH detected in samples collected downstream of the Baxter property).

6.3 CONCLUSION

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response actions selected in this ROD, may present an imminent and substantial endangerment to public health, welfare, or the environment. The current risk afforded by site chemicals that have been and continue to be released into the environment represents a total risk of 1.4×10^{-4} to current workers. Total future site risk to children is 6×10^{-1}, while the total future risk to adults is 8.6×10^{-1}. EPA's acceptable risk range is 1×10^{-4} to 1×10^{-6}.

The risk to terrestrial wildlife appears to be low. Aquatic life continues to be threatened by releases from the site.

7.0 DESCRIPTION OF ALTERNATIVES

The following discussion presents a brief description of soil, surface water, sediment, and groundwater remedial alternatives that have survived the preliminary screening and have been carried through a detailed analysis in the Baxter/IP/Roseburg Feasibility Study (FS) report. To facilitate the analysis of alternatives, the alternatives were categorized into six groups based on media affected and contaminant type. These groups are as follows:

- Soils contaminated with inorganics
- Soils contaminated with organics
- Soils contaminated with inorganics and organics
- Groundwater
- Sediments
- Surface water

Table 7-1 lists the alternatives subject to detailed analysis in the FS.

7.1 SOIL REMEDIAL ALTERNATIVES

Contaminated soils have been divided into sub-unit areas based on contamination levels and the types of chemicals present in the soils. The sub-unit soil areas include the wood treatment property soils, retort and drip pad area soils, No. 3 tank-bermed area soils, wastewater vault area soils, spray field soils, subsurface creosote area soils, Roseburg excavation pond and french drain soils. Proposed soil cleanup will involve approximately 41,000 cubic yards of soil.

7.1.1 SOILS CONTAMINATED WITH INORGANICS

The sub-units contaminated with inorganics only are the Baxter spray field soils, and wood treatment property soils. Total volume of inorganic soils is estimated at 18,750 cubic yards.

Alternative 1 - No Action

Under this alternative, no remedial activity would be employed. Continued groundwater and surface water monitoring would be required. Contaminants would be left at the site untreated and uncontrolled. No risk reduction would result. The alternative would not comply with ARARs, water quality standards, or State discharge limitations.

TABLE 7-1

LIST OF ALTERNATIVES CONSIDERED IN
BAXTER SITE FEASIBILITY STUDY

Soils Contaminated with Inorganics

- No Action
- Excavation and Off-Site Disposal
- Excavation, Fixation, and On-Site Disposal
- Capping

Soils Contaminated with Organics

- No Action
- Excavation and Off-Site Disposal
- Excavation and Off-Site Incineration
- Excavation, Biological Treatment, and On-Site Disposal

Soils Contaminated with Inorganics and Organics

- No Action
- Excavation and Off-Site Disposal
- Excavation and Off-site Incineration
- Capping
- Excavation, Biological Treatment, On-Site Fixation, and On-Site Disposal

Groundwater

- No Action
- Groundwater Extraction, Biological and Chemical Treatment and Discharge to Percoloation/Evaporation Ponds or Reinjection
- Groundwater Extraction, Physical and Chemical Treatment, and Discharge to Percololation/Evaporation Ponds or Reinjection

TABLE 7-1

LIST OF ALTERNATIVES CONSIDERED IN
BAXTER SITE FEASIBILITY STUDY (cont.)

<u>Surface Water</u>

- No Action
- Treatment and/or Isolation of Contaminated Surface Soils
- Collection, Storage, and Treatment of Contaminated Surface Water

<u>Sediment</u>

- No Action
- Excavation, Treatment, and Disposal

Alternative 2 - Excavation and Off-Site Disposal

The excavation and off-site disposal alternative would involve excavation of contaminated surface soil containing arsenic exceeding the 8 ppm clean-up standard[1] (approximate 0 to 1 foot interval, but potentially deeper at localized areas on the site), placement of excavated soil in haul trucks, transport of soil to an off-site disposal facility, and disposal of soil in a contained land-disposal unit permitted to accept the waste. The haul truck loads would be covered with tarps and the exterior of the trucks decontaminated prior to leaving the site. Dust suppression measures would be employed to control dust emissions during excavation and hauling. At the facility, the soil would be placed in a lined and controlled unit meeting RCRA standards. Clean soil would be used to backfill the excavated area.

Alternative 3-Excavation, Fixation, and On-Site Disposal

This alternative would involve excavation of soil contaminated with arsenic exceeding the 8 ppm clean-up goal (approximate 0 to 1 foot interval, but potentially deeper at localized areas of the site), mixing of the soil with a fixation agent (such as Portland Cement), and replacement of the fixed soil on the site. Fixed soil containing arsenic, chromium, copper, and/or zinc at concentrations exceeding the TTLC or STLC criteria will be placed into lined cells. The purpose of the treatment is to stabilize the contaminants and prevent mobilization. The stabilized soil mass would eliminate fugitive dust emissions, prevent surface water erosion of contaminated soil, and reduce leachability of contaminants. EPA has performed treatability studies using site soils. Results of these studies indicate that fixation with a portland cement mixture would be effective in reducing metals leachability to clean-up standards (5 ppm for arsenic). Measures would be taken to protect the surface of the fixed soil mass from physical decomposition. Institutional controls would be put in place to ensure that future land use practices are compatible with the fixed soil mass. The risk posed by the site would be reassessed at 5-year intervals to confirm that this remedy continues to protect public health and the environment.

Alternative 4 - Capping

The capping alternative would involve consolidating contaminated soils exceeding the 8 ppm arsenic clean-up standard in fringe areas and placing the soils on a central portion of the site. The surface of the capping area would be graded to the design contours of the cap. A multilayer cap would be designed to meet

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[1] Inorganic contaminants are commingled. Through removal of arsenic to 8 ppm, all lesser threat contaminants are expected to be removed and treated.

RCRA cap permeability standards and would direct surface water runoff around and away from it. If subsequent plans for the use of the capped area include wood treatment activities, the surface of the cap would need to be protected. Either an asphalt or concrete cover would need to be placed on the cap to maintain its structural integrity. As contaminants would be left in the ground untreated, long-term cap maintenance, institutional controls and site monitoring would be required for this alternative to remain protective.

7.1.2 SOILS CONTAMINATED WITH ORGANICS

The sub-units contaminated with creosote organics are only the wastewater vault area soils, subsurface creosote area soils, and the Roseburg excavation pond and french drain area soils.

Total volume of organic soils is estimated at 12,500 cubic yards.

Alternative 1 - No Action

This No Action alternative would be the same as that described in the No Action alternative for soils contaminated with inorganics.

Alternative 2 - Excavation and Off-site Disposal

This alternative would be the same as Excavation and Off-site Disposal for soils contaminated with inorganics. This alternative would involve excavation of soil containing creosote in the approximate 2- to 12-foot depth range (or to the top of the groundwater table) on the wood treatment property, and 0- to 5-foot range on the Roseburg property, and transport of soil in haul trucks to an approved landfill. Soil would be excavated to meet the 0.5 ppm standard for carcinogenic PAHs[2].

Alternative 3 - Excavation and Off-site Incineration

This alternative would involve excavation of soil in the approximate 2- to 12-foot depth range (or to the top of the groundwater table) on the wood treatment property, and in the 0- to 5-foot range on the Roseburg property, and transport of soil in haul trucks to an off-site incinerator. Soil would be excavated to meet the 0.5 ppm clean-up standard for carcinogenic PAHs. This portion of the alternative would be identical to the excavation and off-site disposal alternatives. At the incineration facility, the soils would be processed for thermal destruction, and the ash would be treated and disposed of as hazardous waste.

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[2]Carcinogenic and non-carcinogenic PAHs are commingled. The excavation of carcinogenic PAHs to the proposed standard will also remove non-carcinogenic PAHs below 1 ppm.

Alternative 4 - Excavation, Biological Treatment, and On-site Disposal

This alternative would involve the excavation of near surface soil in the approximate 2- to 12-foot depth range (or to the top of the groundwater table) on the wood treatment property, and in the 0- to 5-foot range on the Roseburg property. Soil would be excavated to meet the 0.5 ppm clean-up standard for carcinogenic PAHs. After excavation, soil would be placed in a controlled land-treatment unit consisting of a shallow excavation (approximately 10 feet deep), lined with clay and synthetic material, (i.e., the cell would be constructed to meet RCRA liner requirements). The synthetic liner would be designed to collect leachate and prevent contaminants from migrating from the treatment units into groundwater or surface water. The leachate collected would be either returned to the land treatment unit or treated in the groundwater treatment system.

We estimate that eight 1-acre lined treatment cells will be required for this action. Soil from contaminated areas will be excavated based on total allowable concentrations of contaminants in soil. These total concentrations are 0.510 ppm for carcinogenic PAHs, 0.150 ppm for non-carcinogenic PAHs, and 17 ppm for pentachlorophenol. Soil exceeding leachate limits of 0.005 ppm for carcinogenic PAHs, 0.150 ppm for non-carcinogenic PAHs, and 1.7 ppm for pentachlorophenol will also be excavated. The excavated soil will be treated biologically to reduce the leachability of contaminants to the leachate concentration standards of 0.005 ppm for carcinogenic PAHs, 1 ppm for non-carcinogenic PAHs, and 1.7 ppm for pentachlorophenol. The cells will be designed and constructed to prevent release of leachate.

Soil would be treated using natural microbial populations, the effectiveness of which would be enhanced through the mixing of nutrients and fertilizers into the soil. Biological treatment would continue in these cells until the leachate collected consistently shows PAH concentrations below 5 ppb for total carcinogens and 1 ppm for total noncarcinogens.

The soil would be regularly tilled to mix the fertilizers, and to aerate and expose the soil to sunlight. The soil would be irrigated regularly to maintain a proper moisture level. The soil would be sampled at specific intervals to monitor the rate of biological degradation and to verify the achievement of the action levels for contaminants, primarily for PAHs. Once the action level is achieved and the soil considered treated, another layer of soil would be placed over the treated soil in the treatment unit. The next layer would be treated as described above. When the soil layers reach near the level of the top of the unit land surface (approximately 8 feet of treated soil), the unit will be closed. Closure will be accomplished by placing an elevated "soft" cover of clean soil material over the treated elevated "soft" cover of clean soil material over the treated soil. A vegetative cover will be established over the cover soils. Leachate collection monitoring and institutional controls will be necessary after remedy to completion to assure that the residuals are not disturbed or removed. At completion of the remedy, the approximately 12,500 cubic yards of treated soils would be expected to contain low levels of PAHs.

The PRPs have conducted treatability studies using site soils. Results of these studies show bioremediation to be an effective alternative for reducing the creosote levels in soils to meet the leachability standard. Institutional controls will be necessary to ensure that the long-term soil storage units are maintained and are not disturbed until residual concentrations of creosote compounds are less than 0.5 ppm for total carcinogenic PAHs.

7.1.3 SOILS CONTAMINATED WITH ORGANICS AND INORGANICS

The site areas containing soils contaminated with both organics and inorganics are the retort and drip pad areas and the No. 3 tank-bermed area. Total volume of combined organic and inorganic soils is approximately at 9,380 cubic yards.

Alternative 1 - No Action

This No Action alternative would be the same as that described in the No Action alternative for soils contaminated with inorganics.

Alternative 2 - Excavation and Off-site Disposal

This alternative would be the same as Excavation and Off-site Disposal for soils contaminated with inorganics. Excavation and treatment standards would be the same as for the inorganics and organics in soils previously discussed. Excavation would occur from ground surface to a depth of 12 feet or to the point where groundwater prevents further excavation. Implementation of the alternative would require demolition, relocation, and/or replacement of the retort building, storage tanks, 500,000 gallon tank, and associated structures and utilities.

Alternative 3 - Excavation and Off-site Incineration

This alternative would be the same as Excavation and Off-Site Incineration for organic contaminated soils.

Alternative 4 - Capping

This alternative would be the same as Capping for soils contaminated with inorganics.

Alternative 5 - Excavation, Biological Treatment, On-site Fixation, and On-site Disposal

This alternative would involve the excavation of contaminated soils above clean-up standards (8 ppm for arsenic, 17 ppm for pentachlorophenol, 0.001 ppm for dioxins, and 0.5 ppm for carcinogenic PAHs[3]), coupled with soil biological treatment to reduce or destroy organic contaminants (as described in the organics section). Excavation would involve the approximate 0 to 12 foot interval of contaminated soils (or to the point where groundwater prevents further excavation) and placement of the soils in lined-treatment cells for microbial destruction of organics. The biologically treated soil would be fixed with a stabilization agent (e.g., cement) to control mobility of the inorganics and residual organics (as described in the inorganics section). Leachability standards for the stabilized soil would be 5 ppm for arsenic, 0.005 ppb for carcinogenic PAHs, and 1.7 ppm for pentachlorophenol. The treated and fixed soil would then be placed back into lined cells meeting RCRA requirements and handled in a manner protective of human health and the environment. Treatment to reduce organic levels would be required because pilot studies indicate that the organics cannot be immobilized in the fixed mass.

7.2 GROUNDWATER REMEDIAL ALTERNATIVES

The shallow aquifer beneath the site is contaminated with arsenic and creosote compounds. This shallow aquifer exists from near ground surface (2 feet to 8 feet) to approximately 40 feet in depth at its deepest point. Arsenic and creosote contaminated groundwater extends from below the wood treatment area towards the northwest approximately 1,000 feet in the direction of Angel Valley subdivision. Approximately 6 acres are affected below the Baxter wood treatment property and 15 acres below Roseburg's property. A separate body of creosote product also exists below the wood treatment property. The areas of groundwater most seriously affected at the site include areas beneath the wood treatment property, the Roseburg excavation pond, and its french drain collection system.

Although the shallow aquifer below the site is not currently used as a drinking water source, it is a Class I aquifer of high quality and is a potential source that requires minimal treatment for drinking water purposes. The community presently obtains its water supply from wells drilled into deeper aquifers and from springs located upgradient of the site. The shallow aquifer is used locally for yard irrigation purposes.

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[3]The principal threat contaminants are commingled. Through removal of the principal threat contaminants to these levels, all low level threat contaminants are expected to be removed.

Alternative 1 - No Action

This alternative would allow wood treatment chemicals to remain in groundwater with the potential for off-site movement to wells in the Angel Valley area. No risk reduction would result. The alternative would not comply with ARARs or State discharge limitations. The No Action alternative would not preclude long-term groundwater monitoring. Risks posed by the site would be reexamined at 5-year intervals.

Alternative 2 - Groundwater Extraction, Biological and Chemical Treatment, and Discharge

This alternative would involve pumping the contaminated groundwater using extraction wells and biologically treating the water with naturally occurring microorganisms to remove organics contaminants. Treatment would occur until carcinogenic PAH concentrations were reduced to 5 ppb and pentachlorophenol to 2.2 ppb. All principal and low level threat contaminants will be treated to their respective standards by this remedy. Final reduction to clean-up standards will require the use of an activated carbon or UV/ozonation destruction polishing step.

Inorganics would be removed from the extracted groundwater using a chemical precipitation process. The addition of lime to the extracted groundwater will cause metals to form a precipitate which is filtered from the waste stream. A sludge is formed which is dewatered in a filter press. Polishing of the lime treated effluent using either activated alumina or ion exchange techniques may be necessary to meet clean-up standards. The required treatment standard for arsenic is 5 ppb and for zinc is 90 ppb. All principal and low level threat inorganic contaminants will be treated to their respective standards by this remedy.

EPA expects that up to 150,000 gallons of contaminated water may need to be treated and discharged each day. Water would continue to be extracted from the contaminated aquifer until in situ concentrations meet the clean-up standards. This is expected to take at least 30 years to occur. The initial proposed area of groundwater contamination containment will be the boundaries of the wood treatment property during remediation. The point of compliance at the end of the remedial action will be throughout the aquifer below and adjacent to the site, where clean-up standards addressed in this ROD will be attained.

The biological treatment process will produce a sludge waste comprised of bodies of dead microorganisms, suspended solids that have settled in the tanks, and a minor amount of metals that have precipitated or adsorbed to the bodies of microorganisms. The metals treatment process will produce a sludge containing residual metals that will need to be handled as a hazardous waste. If activated carbon is used, the spent activated carbon will need to be handled as a hazardous waste. The activated alumina and ion exchange processes will also produce a concentrated waste that will require special handling and disposal.

International Paper, Roseburg and Baxter have installed a full-scale water treatment unit at the site which will be used for the final remedy. Pilot tests and initial treatment results for this facility indicate that it is capable of meeting the identified standards.

Discharge of up to 150,000 gallons per day of treated groundwater is an implementation requirement. Discharge water would be initially treated to health-based standards listed in Tables 4-1 and 4-2. The proposed point of compliance will be the effluent as it leaves the treatment plant. Several disposal alternatives for treated groundwater may be used to release this volume of water, including the following:

- Disposal to groundwater. Treated water could be discharged by injection wells back to the aquifer. Water treated to health-based standards can be injected into contaminated areas to speed removal of contamination from the aquifer.

- Disposal to subsurface drains or trenches. Water treated to health-based standards could be discharged to a grid system of pipes below the surface. These pipes would contain holes to allow controlled distribution of the treated water into the ground above the aquifer. Again, this could speed removal of contamination from the aquifer.

- Industrial process use. Water treated to health-based standards could be used for industrial operations at the site such as sprinkler system water, wood treatment make-up water, and boiler water.

- Percolation/Evaporation Ponds. Water treated to health-based standards could be distributed into the ground above the aquifer with percolation ponds.

The groundwater pump and treatment alternative can be implemented to address all Federal ARARs for the action. Institutional controls to prevent access to the contaminated aquifer will be necessary while the action is being implemented.

Alternative 3 - Groundwater Extraction, Physical and Chemical Treatment, and Discharge

This alternative would involve all of the process steps included in Alternative 2 of this section except that biological treatment for organics would be replaced with either activated carbon adsorption or UV-oxidation treatment. All other aspects including clean-up goals, time frame for completion, and residuals management would remain the same.

7.3 SURFACE WATER ALTERNATIVES

Prior to construction of surface water drainage berms and ditches, water from the retort, drip pad, and tank berm areas flowed to the northwest into the site discharge drainage. Runoff of this area is presently being collected for storage in above ground tanks and subsequent use as process water in the wood treatment process. Runoff from the remaining portion of the wood treatment property is uncontrolled, flowing either to the north out the main gates or to the west along the railroad tracks. Because surface soils in these areas are significantly contaminated with arsenic and other chemicals, these actions do not prevent precipitation from coming in contact with the soils, thus creating contaminated surface water on the property and which either runs off or infiltrates into the shallow aquifer.

Alternative 1 - No Action

The No Action alternative would not prevent precipitation from coming in contact with contaminated soils. The action could involve monitoring the surface water runoff to measure contamination levels. No action would likely result in violation of current NCRWQCB orders.

Alternative 2 - Treatment and/or Isolation of Contaminated Surface Soils

Remedial alternatives presented in Section 7.1 for contaminated soils would effectively remove, treat, and/or isolate contaminated soils. These actions would prevent or greatly reduce contact between precipitation/surface water and contaminated soil, thereby preventing or minimizing future surface water contamination.

Alternative 3 - Collection, Storage, and Treatment of Contaminated Surface Water

Contaminated surface water would be collected and temporarily stored for process water use or treatment and disposal in the same manner as contaminated groundwater. This would require installation of surface water control berms and ditches and collection of water in sumps. Water would be pumped into storage vessels for use as process water or for treatment and discharge. Significant storage capacity in excess of 1,000,000 gallons of water would be required to contain anticipated rainfall for the most contaminated areas of the site. Clean-up standards for the alternative would be 5 ppb for arsenic and 0.5 ppb for carcinogenic PAHs for water released from the site.

This alternative would represent a temporary remedy for the site. A continued threat for offsite release would remain as long as contaminated soils remained in place. Only through removal or treatment of soils and proper precipitation management on the treated lumber storage areas could a permanent remedy for the surface water problem be achieved.

7.4 SEDIMENT ALTERNATIVES

The potential remedial alternatives for contaminated sediments, sediments in Beaughton Creek near NPDES #1 and site drainage sediments, are limited to (1) no action and (2) excavation by dredging followed by treatment and disposal actions.

Alternative 1 - No Action

This alternative would allow the contaminated sediments to remain in place. Contaminated sediments would continue to be moved downstream by the flushing actions of seasonal runoff for natural degradation of organics and ultimate deposition of inorganics in the bottom sediments of Lake Shastina.

Alternative 2 - Excavation, Treatment and Disposal

This alternative would involve excavation of contaminated sediment. Excavated sediments could be incorporated into treatment options being considered for surface soils. Soil with less than 500 ppm of arsenic is not classified as a hazardous waste so it could be transported for disposal at a municipal landfill. Any sediment removal action would be coordinated with the California Department of Fish and Game.

8.0 SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

An evaluation and comparison of the alternatives are presented in this Section. The comparison is based on the nine key criteria required under the National Contingency Plan and CERCLA Section 121 for use in evaluation of remedial alternatives by EPA. The nine criteria are as follows:

- Overall protection of human health and the environment.
- Compliance with Applicable or Relevant and Appropriate Requirements (See Tables 8-1 and 8-2 for ARARs evaluated).
- Long-term effectiveness and permanence.
- Reduction of toxicity, mobility or volume.
- Short-term effectiveness.
- Implementability.
- Cost.
- State acceptance.
- Community acceptance.

8.1 ALTERNATIVE COMPARISON FOR SOILS

Table 8-3 presents a comparison of alternatives for soils contaminated with inorganics only, Table 8-4 for soils contaminated primarily with organics, and Table 8-5 for soils contaminated with inorganics and organics.

8.2 ALTERNATIVE COMPARISON FOR GROUNDWATER

See Table 8-6 for comparison of alternatives for groundwater treatment remedies.

8.3 ALTERNATIVE COMPARISON FOR SURFACE WATER

See Table 8-7 for comparison of alternatives for surface water control and treatment remedies.

8.4 ALTERNATIVE COMPARISON FOR SEDIMENTS

Two stream segments at the site may warrant remedial action due to the presence of wood treatment chemicals as determined during the remedial investigation. These segments include a 150-foot stretch of the drainage adjacent to the Roseburg power plant and a 100-foot stretch of Beaughton Creek downgradient of the Roseburg NPDES Number 1 discharge point.

A remedy for sediments within Beaughton Creek is not recommended until additional aquatic biota studies can be performed on the Creek. These additional data are important for evaluating the

TABLE 8-1
FEDERAL APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS
BAXTER/IP/ROSEBURG SITE

Standard, Requirement, Criteria, or Limitation	Citation	Description	Comment
Safe Drinking Water Act	40 U.S.C. §300		
Underground Injection Control Regulations	40 C.F.R. Parts 144--147	Provides for protection of underground sources of drinking water.	A permit is not required for on-site CERCLA response actions, but substantive requirements would apply for reinjection into groundwater of treated water.
Solid Waste Disposal Act (Resource Conservation and Recovery Act)	42 U.S.C. §§3251-3259, 6901-6987		This law has been amended by the Resource Conservation and Recovery Act (RCRA) and the Hazardous and Soil Waste Amendments (HSWA).
Identification and Listing of Hazardous Waste	40 C.F.R. Part 264.1	Defines those solid wastes which are subject to regulation as hazardous wastes under 40 C.F.R. Parts 261-265 and Parts 124, 270, 271, and Subtitle C regulates treatment and disposal of hazardous waste.	Under CERCLA, SWDA requirements may be relevant and appropriate under the circumstances of the release at the site. RCRA Subtitle C regulates any solid wastes containing arsenic or pentachlorophenol which pose a threat to public health or welfare or the environment. These are termed "hazardous substances," and disposal regulations require treatment to specific standards for proper disposal.
Releases from Solid Waste Management Units	40 C.F.R. Part 264 Subpart F	Establishes maximum contaminant concentrations that can be released from hazardous waste units in Part 264, Subpart F.	The maximum contaminant concentrations that can be released from hazardous waste units are identical to the MCLs.
Standards Applicable to Generators of Hazardous Waste	40 C.F.R. Part 262	Establishes standards for generators of hazardous waste.	Transportation and disposal of filter cake and spent carbon and any other hazardous wastes thay may need off-site disposal will comply with these requirements.
Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities	40 C.F.R. Part 264	Establishes minimum national standards which define the acceptable management of hazardous waste for owners and operators of facilities which treat, store, or dispose of hazardous waste.	The substantive portions of these regulations will be incorporated into the remedies identified in this ROD.

TABLE 8-1
FEDERAL APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS
BAXTER/IP/ROSEBURG SITE (cont.)

Standard, Requirement, Criteria, or Limitation	Citation	Description	Comment
Land Disposal	RCRA Sections 3004(d)(3), (e)(3) 40 C.F.R. Part 268	Effective 11/8/88 disposal of contaminated soil or debris from CERCLA Response action or RCRA corrective actions is subject to land disposal prohibitions and/or treatment standards.	Established a timetable for restriction of burial of wastes and other hazardous materials. Applicable for alternative involving off- or on-site disposal of contaminated soils.
Clean Air Act	42 U.S.C. §§7401-642	Regulates air quality and particulate emissions during excavation.	The substantive requirements will be met for Air Pollution Control District rules for excavation alternatives.
Hazardous Materials Transportation Act	49 U.S.C. §§1801-1813		
Hazardous Materials Transportation Regulations	49 C.F.R. Parts 107, 171-177	Regulates transportation of hazardous materials.	Regulations required for transportation of hazardous materials to the site and wastes from the site.
Fish and Wildlife Coordination Act	16 U.S.C. §§661-666	Requires consultation when Federal department or agency proposes or authorizes any modification of any stream or other water body and adequate provisions for protection of fish and wildlife resources.	If an alternative developed would involve any modifications of nearby streams.
Executive Order on Protection of Wetlands	Exec. Order No. 11,990 40 C.F.R. §6.302(a) and Appendix A	Requires Federal agencies to avoid to the extent possible, the adverse impacts associated with the destruction or loss of wetlands and to avoid support of new construction in wetlands if a practical alternative exists.	If an alternative developed would involve any modification or loss of wetlands.

TABLE 8-2
CALIFORNIA APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS
BAXTER/IP/ROSEBURG SITE

Standard, Requirement, Criteria, or Limitation	Citation	Description	Comment
California Air Resources Act	Health & Safety Code, Div. 26 Sec. 39000 et seq. 17 CCR, Part 111, Chapter 1, Sec. 60000 et seq.	Regulates both nonvehicular and vehicular sources of air contaminants in California.	The local Air Pollution Control District sets allowable discharge standards. Emissions from heavy equipment and excavation dusts will need to comply with APCD standards. CA regulatory agency is the Air Resources Board. Local regulatory agencies are the Air Pollution Control Districts.
California Safe Drinking Water Act	Health & Safety Code, Div. 5, Part 1, Chapter 7, SEC. 4010 et seq. 22 CCR, Div. 4, Chapter 15, Sec. 64401 et seq.	Regulations governing public water systems. Drinking Water Quality Standards - Maximum contaminant Levels (MCLs), Secondary Maximum Contaminant Levels (SMCLs).	The State MCL of 1 ppb for benzene was selected as a groundwater standard for this site. CA Regulatory Agency: Department of Health Services, Sanitary Engineering.
Porter Cologne Water Quality Control Act	Water Code, Div. 7, Sec. 13000 et seq.	Establishes authorities of the State and Regional Water boards to protect water quality by regulating waste disposal and by requiring cleanup of hazardous conditions.	The Basin Plan was used to establish surface water discharge limitations and sediment clean-up standards.
California Hazardous Waste Control Laws	Health & Safety Code, Div. 20, Chapter 6.5, Sec. 25100 et seq.	Regulations governing hazardous waste control; management and control of hazardous waste facilities; transportation; laboratories; classification of extremely hazardous, hazardous, and nonhazardous waste.	These regulations were used to establish hazardous waste clean-up levels, facility closure requirements, and requirements for siting and construction of a waste disposal facility. CA Regulatory Agency: Department of Health Services.

TABLE 8-2
CALIFORNIA APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS
BAXTER/IP/ROSEBURG SITE (cont.)

Standard, Requirement, Criteria, or Limitation	Citation	Description	Comment
California Toxic Pits Cleanup Act (TPCA)	Health & Safety Code, Sec. 25250 <u>et</u> <u>seq</u>.	Regulates the closure of surface impoundments containing hazardous waste.	Several units identified by the NCRWQCB are present at the site. Several TPCA units present at site.
State Action Levels	DHS Criteria	Criteria setting chemical specific concentration levels. Numerical limits designed to protect human health from chemical constituents in drinking water. Recommended acceptable limits. Action levels are drinking water exposure criteria implemented throughout the state. They are developed by DHS Sanitary Engineering Branch to supplement Safe Drinking Water Act standards.	The Applied Action Level of 2.2 ppb was used to identify the clean-up standard for pentachlorophenol. CA Regulatory Agency: Department of Health Services, Sanitary Engineering Branch.
Criteria for Identification of Hazardous and Extremely Hazardous Wastes-Threshold Limit Concentrations	22 CCR, Div. 4, Chapter 30, Art. 11, Sec. 66693 <u>et</u> <u>seq</u>.	Promulgated criteria to determine if a material is hazardous. Includes Soluble Threshold Limit Concentrations (STLCs) and Total Threshold Limit Concentration (TTLCs).	TTLC and STLC criteria were used to identify soil clean-up standards. CA Regulatory Agency: Department of Health Services.

Table 8-3 Summary Comparison of Alternatives:
Surface Soils Contaminated with Inorganics Only

	No Action	Excavation and Offsite Disposal	Excavation, Fixation and On-site Disposal	Capping
1. Overall Protection of Human Health and the Environment				
	No Action would not address remedial action objectives. Continued releases of contaminants would occur in exceedence of health standards. It would not be protective of public health or the environment.	This alternative would be protective through placement of contaminated soils at at controlled facility. Protectiveness would be dependent on the integrity of the facility receiving the wastes.	Fixation of contaminated soils would be protective through reduction of mobility. Direct contact and inhalation risk would be reduced, surface water and ground-water would be protected.	Capping would reduce direct contact and surface water runoff risk. Some reduction in groundwater mobility would be achieved but the action would not be totally protective of groundwater.
2. Compliance with ARARs				
	The No Action Alternative would not comply with Federal or State health protection standards.	Excavation and off-site disposal could be implemented to address ARARs. Treatment to reduce arsenic leachability may be required at disposal facility.	On-site fixation and disposal could be implemented to address ARARs. Initial fixation tests indicate that leachability of arsenic can be reduced to <5 mg/L. A cap over fixed soils could be constructed to meet RCRA ARARs.	A cap could be constructed to address ARAR standards. A cap could meet surface water protection ARARs. A cap may not allow compliance with groundwater ARARs (MCLs).
3. Reduction in Toxicity, Mobility, or Volume				
	No Action would not achieve any reduction in TMV.	Excavation and removal would reduce mobility at the site. Long-term mobility reduction would depend on stability and treatment at disposal facility. No reduction in toxicity or volume would be achieved.	Fixation would reduce leachability and mobility at site. No reduction in toxicity but exposure potential would be reduced. Volume of contaminated media would increase.	Capping would reduce surface water runoff potential and air dispersion. Some reduction in groundwater mobility possible. No reduction in toxicity or volume would be achieved.
4. Short-term Effectiveness				
	Not applicable. The alternative does not involve an action.	Excavation could be performed to be protective of workers and the community. Worker protection and runoff control would be necessary. Transportation accidents during shipment would be a concern.	Excavation and fixation could be performed to be protective of workers and community. Greater chance for worker and community exposure due to increased material handling could exist.	Capping would pose least risk to workers and community during implementation. Minima' amount of contaminants would be handled.

Table 8-3 Summary .rison of Alternatives
Surface Soils Contaminated with Inorganics Only (continued)

	No Action	Excavation and Offsite Disposal	Excavation, Fixation and On-site Disposal	Capping
5. Long-term Effectiveness and Permanence				
	No Action would offer no long-term effectiveness. Site risks would remain indefinitely.	Excavation and off-site disposal would remove long-term risk from site. Overall risk would be dependent on the integrity of the facility receiving the waste.	Long-term effectiveness would be dependent on integrity of fixed mass and ability of fixative to prevent leaching of arsenic. Long-term test results are not available for the technology.	Long-term effectiveness for protection of surface water would be dependent on maintenance of the cap. This may not be a permanent alternative if groundwater contamination continues.
6. Implementability				
	Not Applicable. The alternative does not involve an action.	Construction and transportation aspects of excavation are easily implemented. Capacity of disposal facility to receive waste could affect implementation. RCRA land disposal treatment standards could affect implementation.	Construction and fixation aspects are easily implemented. Adequate space is avaible to treat and dispose of soil. Land disposal leachability standards appear achievable. State land disposal issues require resolution.	Construction of the cap is readily implementable.
7. Cost	Capital: $0	Capital: $12,840,400	Capital: $4,525,800	Capital: $6,204,100
	Annual O&M: $ 9,800	Remedy Ann. O&M: $ 0	Remedy Ann. O&M: $ 0	Remedy An O&M: $ 0
	Remedy O&M: $ 0	Post Ann. O&M: $ 0	Post Ann. O&M: $ 16,500	Post An. O&M: $ 53,500
	Present Worth: $132,400	Present Worth: $12,840,400	Present Worth: $4,748,800	Present Worth: $6,926,900
8. Community Acceptance				
	Not acceptable.	Acceptable.	Acceptable.	Not acceptable
9. State Acceptance				
	Not acceptable.	The State would prefer an alternative that dealt with contamination at the site.	Acceptable if action meets all substantive RCRA requirements.	Not acceptable as final action. The State prefers treatment.

Table 8-4 Summary Comparison of Alternatives:
Near Surface Soils Contaminated with Organics Only

No Action	Excavation and Offsite Disposal	Excavation, Bioremediation, and On-site Disposal	Excavation and Off-site Incineration
1. Overall Protection of Human Health and the Environment			
No Action would not address remedial action objectives. Continued releases of contaminants would occur in exceedence of health standards. It would not be protective of public health or the environment.	This alternative would be protective through placement of contaminated soils at at controlled facility. Protectiveness would be dependent on the integrity of the facility receiving the wastes.	Bioremediation of contaminated soils would be protective through nearly complete destruction of PAHs. Direct contact and inhalation risk would be reduced. Surface water and groundwater would be protected.	Incineration would destroy PAHs eliminating risk at site. Emissions controls at incinerator would be necessary to protect health at incinerator site.
2. Compliance with ARARs			
The No Action Alternative would not comply with Federal or State health protection standards.	Excavation and off-site disposal could be implemented to address ARARs. Treatment to reduce leachability may be required at disposal facility.	Construction of land treatment cells and implementation of bioremediation could be performed to comply with ARARs. State and Federal closure requirements for the long-term containment unit will need to be addressed.	Incineration could be implemented to address all ARARs.
3. Reduction in Toxicity, Mobility, or Volume			
No Action would not achieve any reduction in TMV.	Excavation and removal would reduce mobility at the site. Long-term mobility reduction would depend on stability and treatment at disposal facility. No reduction in toxicity or volume would be achieved.	Bioremediation would significantly reduce PAH levels in soils. Significant volume and toxicity reduction would be achieved. Mobility of residuals would be controlled through cell liner and leachate monitoring system.	Incineration would destroy 99.99% of PAHs. Significant reduction in toxicity, mobility, and volume would be achieved. Long-term containment of ash as a hazardous waste would not be necssary.
4. Short-term Effectiveness			
Not applicable. The alternative does not involve an action.	Excavation could be performed to be protective of workers and the community. Worker protection and runoff control would be necessary. Transportation accidents during shipment would be a concern.	Excavation and bioremediation could be performed to be protective of workers and community. A greater chance exists for worker and community exposure due to increased material handling.	Excavation could be performed to be protective. Emission control equipment would be necessary at incinerator site. Transportation accidents would be a concern.

Table 8-4 Summary Comparison of Alternatives:
Near Surface Soils Contaminated with Organics Only (continued)

No Action	Excavation and Offsite Disposal	Excavation, Bioremediation, and On-site Disposal	Excavation and Off-site Incineration
5. Long-term Effectiveness and Permanence			
No Action would offer no long-term effectiveness. Site risks would remain indefinitely.	Excavation and off-site disposal would remove long-term risk from site. Overall risk would be dependent on the integrity of the facility receiving the waste.	Long-term effectiveness would be dependent on integrity of containment cell to control residuals. Long-term leachate monitoring would be required.	Incineration offers significant long-term effectiveness through destruction of contaminants with no need for long-term residuals management.
6. Implementability			
Not Applicable. The alternative does not involve an action.	Construction and transportation aspects of excavation are easily implemented. Capacity of disposal facility to receive waste could affect implementation. RCRA land disposal treatment standards could affect implementation.	Construction of biormediation treatment cells and the bioremediation process are easily implemented. Adequate space is avaible to treat and dispose of soil. Land disposal leachability standards appear achievable.	Implementation of off-site incineration would depend on incinerator facility capacity to accept the volume of soil. Other aspects are implementable.
7. Cost			
Capital: $ 0	Capital: $11,232,900	Capital: $ 5,487,300	Capital: $39,237,100
Remedy O&M: $ 9,800	Remedy O&M: $ 0	Remedy O&M: $ 224,700	Remedy O&M: $ 0
Post O&M: $ 0	Post O&M: $ 0	Post O&M: $ 13,600	Post O&M: $ 0
Present Worth: $ 132,400	Present Worth: $11,232,900	Present Worth: $ 7,370,800	Present Worth: $39,237,100
8. Community Acceptance			
Not acceptable.	Acceptable	Acceptable	Acceptable
9. State Acceptance			
Not acceptable.	The State would prefer an alternative that dealt with the contamination on site.	Alternative would be acceptable if all requirements are met.	Alternative would be acceptable if all requirements are met.

Table 8-5 Summary Comparison of Alternatives:
Surface Soils Contaminated with Inorganics and Organics

No Action	Excavation and Offsite Disposal	Excavation, Bioremediation, Fixation and On-site Disposal	Excavation and Off-site Incineration and Disposal	Capping
1. Overall Protection of Human Health and the Environment				
No Action would not address remedial action objectives. Continued releases of contaminants would occur into air, surface water, and groundwater in exceedence of health standards. It would not be protective of public health or the environment.	This alternative would be protective through placement of contaminated soils at at controlled facility. Protectiveness would be dependent on the integrity of the facility receiving the wastes and treatment of soils performed at the facility.	Bioremediation would destroy a significant amount of organic contaminants. Fixation of residuals and containment in cells would be protective through reduction of mobility. Thereby, preventing direct contact and inhalation risk. Surface water and groundwater would be protected.	Incineration would destroy 99.99% of organic contaminants. Long-term containment of residuals would be required due to arsenic content. Alternative provides best protection for contact, groundwater and surface water runoff risks at the site.	Capping would reduce direct contact and surface water runoff risk. Some reduction in groundwater mobility would be achieved, but the action would not be totally protective of groundwater.
2. Compliance with ARARs				
The No Action Alternative would not comply with Federal or State health protection standards.	Excavation and off-site disposal could be implemented to address ARARs. Treatment to reduce PAH leachability may be required at disposal facility.	On-site bioremediation, fixation and disposal of residuals could be implemented to address ARARs. Leachability restrictions would need to be met.	Off-site incineration and ash disposal could be implemented to address all ARARs.	A cap could be constructed to address ARAR standards. A cap could meet surface water protection ARARs. A cap may not allow compliance with groundwater ARARs (MCLs).
3. Reduction in Toxicity, Mobility, or Volume				
No Action would not achieve any reduction in TMV.	Excavation and removal would reduce mobility at the site. Long-term mobility reduction would depend on stability and treatment at disposal facility. No reduction in toxicity or volume would be achieved.	On-site bioremediation and fixation in a contained cell would significantly reduce toxicity, mobility and volume through destruction of PAHs. The cell liners and leachate collection system could effectively prevent mobility at the site.	Incineration would remove from site PAHs above action level and destroy 99.99% of contaminants removed. Significant reductions in toxicity, mobility, and volume would be achieved for PAHs. Ash would contain elevated arsenic. Mobility will be controlled at disposal facility.	Capping would reduce surface water runoff potential and air dispersion. Some reduction in groundwater mobility possible No reduction in toxicity or volume would be achieved.
4. Short-term Effectiveness				
Not applicable. The alternative does not involve an action.	Excavation could be performed to be protective of workers and the community. Worker protection and runoff control would be necessary. Transportation accidents during shipment would be a concern.	Excavation, bioremediation and fixation could be performed to be protective of workers and community. A greater chance for worker and community exposure exists due to increased material handling.	Excavation could be performed to be protective of workers and the community. The risk of transportation accidents is a concern. Emissions controls at incinerator would be necessary to be protective at the incinerator site.	Capping would pose least risk to workers and community during implementation. Least amount of contaminants would be handled.

Table 8-5 Summary Comparison of Alternatives:
Surface Soils Contaminated with Inorganics and Organics (continued)

No Action	Excavation and Offsite Disposal	Excavation, Bioremediation, Fixation and On-site Disposal	Excavation, Off-site Incineration, and Ash Disposal	Capping
5. Long-term Effectiveness and Permanence				
No Action would offer no long-term effectiveness. Contaminants would continue to move into groundwater unabated. Site risks would remain indefinitely. This would not be a permanent remedy.	Excavation and off-site disposal would remove long-term risk from site. Overall risk would be dependent on the integrity of the facility receiving the waste. Permanance is dependent on integrity of disposal facility	Long-term effectiveness would be dependent on residual PAH concentrations in disposal cells, the integrity of the cells, and leachate collection/monitoring systems. This would be a permanent remedy when leachate generation potential no longer exists.	Incineration would provide significant long-term effectiveness through immediate destruction of PAHs. No residuals would remain requiring long-term management. This is be a permanent remedy.	Long-term effectiveness for protection of surface water dependent on maintenance of the cap. This may not be a permanent alternative if groundwater contamination continues.
6. Implementability				
Not Applicable. The alternative does not involve an action.	Construction and transportation aspects of excavation are easily implemented. Capacity of disposal facility to receive waste could affect implementation. RCRA land disposal treatment standards could affect implementation and treatment might be required.	Construction of cells and bio-remediation/fixation processes are easily implemented. Adequate space is avaible to treat and dispose of soil. Land disposal leachability standards appear achievable. Long-term stability of fixed soil is unknown. Federal and State closure requirements are unknown.	Incineration may prove difficult give volume of soil to be burned, presence of elevated arsenic, and capacity of incinerators to handle the volume. Dioxin incineration may also be an issue.	Construction of the cap is implementable. Construction would require relocation or replacement of wood treatment structures and tanks.
7. Cost				
Capital: $ 0	Capital: $10,946,900	Capital: $ 6,648,500	Capital: $32,235,400	Capital: $ 3,155,800
Remedial O&M: $ 9,800	Remedial O&M: $ 0	Remedial O&M: $ 194,700	Remedial O&M: $ 0	Remedial O&M: $ 0
Post O&M: $ 0	Post O&M: $ 0	Post O&M: $ 13,600	Post O&M: $ 0	Post O&M: $ 33,500
Present Worth: $ 132,000	Present Worth: $10,946,000	Present Worth: $ 8,290,500	Present Worth: $32,235,400	Present Worth: $ 3,608,300
8. Community Acceptance				
Not acceptable.	Acceptable.	Acceptable.	Acceptable.	Not acceptable.
9. State Acceptance				
Not acceptable.	The State would prefer an alternative that dealt with contamination on site.	Alternative would be acceptable if all requirements are met.	Acceptable.	Not acceptable without treatment.

Table 8-6 Summary Comparison of Alternatives:
Groundwater and Subsurface Soils Contaminated with Creosote
and Groundwater Contaminated with Arsenic

	No Action	Groundwater Extraction, Biological Treatment of Organics, Chemical Treatment of Inorganics.	Groundwater Extraction, UV or Carbon Treatment of Organics, Chemical Treatment of Inorganics.
1. Overall Protection of Human Health and the Environment			
	No Action would allow continued migration of contaminants towards Angel Valley. Groundwater concentrations exceeding health standards would exist indefinitely. The alternative offers no protectiveness.	Extraction would contain the plume preventing further downgradient movement. Biological treatment would destroy significant amount of organics. Metals treatment to MCLs would provide protection. The alternative would be protective.	Extraction would contain the plume. UV treatment would destroy organics. Activated carbon treatment would remove organics but require further treatment. Metals treatment to MCLs would provide protection. The alternative would be protective.
2. Compliance with ARARs			
	The No Action Alternative would not comply with ARARs. Contaminants at concentrations above health standards would remain in drinking water source.	Treatment to achieve ARARs could be accomplished. Discharge of treated water to surface waters is necessary. Modifications of State discharge requirements would be required.	Treatment to achieve ARARs could be accomplished. Discharge of treated water to surface water is necessary to implement. Modifications of State discharge requirements would be required.
3. Reduction in Toxicity, Mobility, or Volume			
	The No Action alternative would not achieve any reduction in toxicity, mobility, or volume. Increased volume of contaminated groundwater is possible from movement of contaminants.	Extraction of groundwater would contain the plume, stopping its mobility. Organics treatment would reduce mass and toxicity. Inorganics treatment would reduce volume through concentration in a filter cake. Proper disposal of filter cake would control mobility of arsenic.	Extraction of groundwater would control the plume stopping its mobility. Organics treatment would reduce mass and toxicity. Inorganics treatment would reduce volume through concentrating in a filter cake. Proper disposal of filter cake would control mobility of arsenic.

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Table 8-6 Summary Comparison of Alternatives:
Groundwater and Subsurface Soils Contaminated with Creosote
and Groundwater Contaminated with Arsenic (continued)

	No Action	Groundwater Extraction, Biological Treatment of Organics, Chemical Treatment of Inorganics	Groundwater Extraction, UV/Carbon Treatment of Organics, Chemical Treatment of Inorganics
4. Short-term Effectiveness			
	Not Applicable. No action is taken.	The extraction and treatment process can be constructed and operated to be protective of human health and the environment. Overall effectiveness of biological treatment to achieve treatment standards will be assessed during pilot studies. Side stream wastes can be effectively handled.	The extraction and treatment process could be constructed and operated to be protective of human health and the environment. The overall effectiveness of UV destruction is not known. Activated carbon is highly effective in removing organics. Side stream wastes can be effectively handled.
5. Long-term Effectiveness and Permanence			
	No long-term effectiveness would be achieved under No Action.	Pump and treatment is expected to take over 30 years to achieve Treatment Standards. Total aquifer restoration would require significantly longer time. Once MCLs or action levels are achieved the remedy will be permanent.	Pump and treatment is expected to take 30 years to achieve MCLs. Total aquifer restoration significantly longer time. Once achieved, the remedy will be permanent.
6. Implementability			
	Not applicable. No remedy implemented.	Alternative implementable using standard materials and equipment. Space for pump and treatment systems available. Waiver of State discharge prohibitions required for discharge treated effluent to surface water.	Alternative implementable using standard materials and equipment. Space for pump and treatment systems available. Waiver of State discharge prohibitions required for discharge to surface water.

Table 8-6 Summary Comparison of Alternatives:
Groundwater and Subsurface Soils Contaminated with Creosote
and Groundwater Contaminated with Arsenic (continued)

Table 8-6 Summary Comparison of Alternatives:
Groundwater and Subsurface Soils Contaminated with Creosote
and Groundwater Contaminated with Arsenic (continued)

	No Action	Groundwater Extraction, Biological Treatment of Organics, Chemical Treatment ofInorganics	Groundwater Extraction, UV/Carbon Treatment of Organics, Chemical Treatment of Inorganics
7. Cost			
	Capital: $ 0	Capital: $ 4,315,800	Capital: $ 4,018,900
	Annual O&M: $ 9,800	Annual O&M: $ 1,163,900	Annual O&M: $ 1,328,900
	Closure: $ 0	Closure: $ 0	Closure: $ 0
	Present Worth: $ 132,400	Present Worth: $17,419,000	Present Worth: $19,587,600
8. Community Acceptance			
	Not acceptable.	Acceptable	Acceptable
9. State Acceptance			
	Not acceptable.	Groundwater pump and treatment concept is acceptable to the State.	Groundwater pump and treatment concept is acceptable to the State.

TABLE 8-7

SUMMARY COMPARISON OF ALTERNATIVES:
SURFACE WATER CONTROL

No Action	Treatment and or Isolation of Contaminated Soils	Collection, Storage, and Treatment of Contaminated Runoff
1. Protection of Human Health and The Environment		
Existing controls would be effective in preventing some releases. Potential for significant releases would still exist impacting aquatic life. No Action would not be protective.	Removal, treatment, fixation and/or capping of contaminated soil could greatly minimize or prevent future surface water contamination. Soil remedial alternatives would provide protection of surface water resources.	Collection, storage, and treatment would address runoff problems, but not soil source problems. This alternative would not prevent releases of wood treatment chemicals during intense precipitation events. This would be an interim measure.
2. Compliance with ARARs		
No Action would not completely comply with ARARs for surface water discharge or protection.	Soil remedial alternatives would comply with surface water ARARs.	Collection and treatment could be performed to comply with ARARs.
3. Reduction in Toxicity, Mobility, or Volume		
Interim measures would prevent some mobility and reduce some volume. Potential for releases would still occur.	All soil remedial alternatives would result in significant reductions in toxicity, mobility, and volume.	Collection and treatment would reduce volume and mobility of contaminants in surface water. The alternative would not address source mobility.

TABLE 8-7

SUMMARY COMPARISON OF ALTERNATIVES:
SURFACE WATER CONTROL (cont.)

	No Action	Treatment and or Isolation of Contaminated Soils	Collection, Storage, and Treatment of Contaminated Runoff
4. Short-term Effectiveness			
	Intermim measures would be only partitially effective in protecting human health and the environment.	All soil remedial alternatives could be implemented to be protective of surface waters.	Collection and treatment could be implemented to be protective of surface waters. Potential for releases would still remain.
5. Long-term Effectiveness			
	Interim measures would not provide long-term protectiveness because source soils would not be addressed.	All soil remedial alternatives would provide long-term effectiveness. Leachability of arsenic from fixed soil would be a long-term concern. Long-term monitoring would be required for a soil fixation alternative.	This alterntative would not provide long-term effectiveness unless source soils are remediated. Potential for release would remain.
6. Implementability			
	No Action is implementable.	All soil remedial alternatives are implementable	Collection and treatment of runoff is implementable.

TABLE 8-7

SUMMARY COMPARISON OF ALTERNATIVES:
SURFACE WATER CONTROL (cont.)

	No Action	Treatment and or Isolation of Contaminated Soils	Collection, Storage, and Treatment of Contaminated Runoff
7. Cost			
	Capital: $ 0	See Soil Remedial Alternatives for Costs	Capital: $ 966,600
	Remedial O&M: $ 0		Remedial O&M: $ 59,700
	Post O&M: $ 9,800		Post O&M: $ 0
	Present Worth: $ 132,400		Present Worth: $1,447,300
8. Community Acceptance			
	Not Acceptable	Acceptable	Acceptable
9. State Acceptance			
	Not Acceptable	See discussion under soil alternatives.	Acceptable only as an interim measure.

necessity of a sediment remedy. Fish have returned to the affected stream segment since the November 1988 release of creosote into the stream. The flushing action of spring stream flows may have been effective in scouring the creosote and contaminated sediments from the affected segment of the stream. EPA will work with the California Department of Fish and Game and the North Coast Regional Water Quality Control Board in the development of studies necessary to evaluate restoration of the Creek and any future remedial action.

Sediments within a short segment of the site discharge drainage adjacent to the Roseburg power plant contain elevated arsenic. These sediments will be excavated with a backhoe and handled in the same manner as contaminated soils.

8.5 REMEDY SELECTION RATIONALE

A comparison of alternatives by the nine Selection Criteria and rationale for selection of the site remedies are discussed in this section. The criteria used in selecting each remedy are summarized in Table 8-8.

8.5.1 SURFACE SOILS CONTAMINATED WITH INORGANICS ONLY

Alternatives Assessed

- o No Action (No Action)
- o Excavation and Off-site Disposal (Off-site Disposal)
- o Excavation, Fixation, and On-Site Disposal (Fixation)
- o Capping (Capping)

Criteria Assessment

Overall Protection of Human Health and the Environment. No Action would not be protective of human health or the environment; continued releases of wood treatment chemicals into the environment would occur. Capping would be protective of surface water and prevent direct contact and inhalation exposure. Capping would be partially protective of groundwater, with protectiveness limited by the high groundwater conditions at the site. Off-site Disposal and Fixation would be equally protective of human health and the environment.

Compliance with ARARs. No Action would not comply with Federal and State ARARs. Capping of soils would not address groundwater protection ARARs. Off-site Disposal and Fixation could be implemented to comply with ARARs.

Reduction in Toxicity, Mobility, or Volume (TMV). No Action would not achieve a TMV reduction. Capping would reduce surface mobility, but not groundwater mobility. Off-site Disposal and

TABLE 8-8
REMEDY SELECTION SUMMARY

Alternative	Selection Assessment
Surface Soils Contaminated with Inorganics Only	
No Action	Not protective Does not comply with ARARs No TMV reduction Not acceptable to community or State
Excavation and Off-site Disposal	Protective Complies with ARARs Reduces mobility Not cost effective Highest cost Acceptable to community, State would prefer on-site treatment
Excavation, Fixation and On-Site Disposal	Protective Complies with ARARs Reduces mobility As Effective as Off-Site Disposal Least cost Acceptable to community, preferred by State
Capping	Not protective of groundwater Does not comply with groundwater ARARs No long-term effectiveness Higher cost than Fixation Not acceptable to community or State
Near Surface Soils Contaminated with Organics Only	
No Action	Not protective Does not comply with ARARs No TMV reduction Not effective Not acceptable to community or State
Excavation and Off-site Disposal	Protective Complies with ARARs No TMV reduction Not cost effective Acceptable to community State would prefer on-site treatment

TABLE 8-8
REMEDY SELECTION SUMMARY (cont.)

Alternative	Selection Assessment
Excavation, Bioremediation, and On-site Disposal	Protective Complies with ARARs Significant TMV reduction Cost effective Acceptable to community and State
Excavation and Off-site Incineration	Protective Complies with ARARs Significant TMV reduction Highest cost Acceptable to community and State
<u>Surface Soils Contaminated with Inorganics and Organics</u>	
No Action	Not protective Does not comply with ARARs No TMV reduction Not acceptable to community or State
Excavation and Off-site Disposal	Protective Complies with ARARs No significant TMV reduction Not cost effective Acceptable to community, State would prefer alternative that treats waste at site.
Excavation, Bioremediation, and Onsite Disposal	Protective Complies with ARARs Significant TMV reduction Cost effective Acceptable to community and State
Excavation and Off-site Incineration and Disposal	Protective Complies with ARARs Significant TMV reduction Potential capacity problems Highest cost Acceptable to community and State
Capping	Not protective Does not comply with ARARs No TMV reduction Not cost effective Not acceptable to community or State

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TABLE 8-8
REMEDY SELECTION SUMMARY (cont.)

Alternative	Selection Assessment
<u>Groundwater and Subsurface Soils Contaminated with Creosote and Groundwater Contaminated with Inorganics</u>	
No Action	Not protective Does not comply with ARARs No TMV reduction Not effective Not acceptable to community or State
Groundwater Extraction, Biological Treatment, Chemical Treatment	Protective Complies with ARARs Significant TMV reduction Cost effective Acceptable to community and State
Groundwater Extraction, UV/GAC Treatment, Chemical Treatment	Protective Complies with ARARs Significant TMV reduction Higher cost Acceptable to community and State

Fixation would reduce mobility through treatment and containment. Neither alternative would reduce toxicity or volume.

Short-term Effectiveness. All alternatives could be implemented to be protective of workers and the community during remedial action. Transportation accidents resulting in spills of contaminated materials would be a concern for the Off-site Disposal alternative.

Long-term Effectiveness and Permanence. No action would not offer any long-term effectiveness. Capping could remain effective for preventing surface exposure as long as the cap was maintained. Capping would not provide long-term protection of groundwater. Off-site Disposal would transfer the long-term risk to the receiving landfill. Effectiveness would depend on the long-term viability of that facility. Long-term effectiveness for Fixation would depend on the long-term maintenance and monitoring of the fixed soil mass, and liner system used to control leachate. Fixation would not preclude a subsequent treatment or remedy should such become necessary.

Implementability. There are no significant constraints with the exception of health protection ARAR considerations for No Action and Capping that would preclude implementation of the alternatives. Off-site Disposal could be affected by the treatment and disposal capacity of the receiving facilities.

Costs. For the action alternatives, Fixation would be the least expensive alternative at $4.7 million. Capping would cost $6.2 million, while Off-site Disposal would cost $12.8 million.

Community Acceptance. No Action and Capping would not be acceptable to the community. The Off-site Disposal and Fixation alternatives appear to be acceptable.

State Acceptance. No Action and Capping would not be acceptable to the State. The State would prefer a remedy that would treat the waste at the site making Fixation the most acceptable alternative.

Remedy Selection Rationale

EPA has selected Excavation, Fixation, and On-Site Disposal as the remedy for soils contaminated with inorganics only. Although the remedy is equally protective and effective as Off-site Disposal, it is less costly and more acceptable to the State.

8.5.2 NEAR SURFACE SOILS CONTAMINATED WITH ORGANICS ONLY

Alternatives Assessed

- o No Action (No Action)
- o Excavation and Off-Site Disposal (Off-site Disposal)
- o Excavation, Bioremediation, and On-Site Disposal (Bioremediation)
- o Excavation and Off-Site Incineration (Incineration)

Criteria Assessment

Overall Protection of Human Health and the Environment. The No Action alternative would not be protective of groundwater. Off-site Disposal, Bioremediation, and Incineration could be implemented to be protective of human health and the environment.

Compliance with ARARs. No Action would not comply with ARARs. The remaining alternatives could be implemented to comply with ARARs.

Reduction in Toxicity, Mobility, or Volume (TMV). No Action would not result in TMV reduction. TMV reduction for Off-Site Disposal would depend on treatment, if any, at the facility receiving the waste. Significant reduction in TMV would be achieved through the Bioremediation and Incineration alternatives.

Short-term Effectiveness. All action alternatives could be implemented to be protective of workers and the community during implementation.

Long-term Effectiveness and Permanence. No Action would not achieve any long-term effectiveness. Long-term effectiveness of Off-Site Disposal would be dependent on the integrity and treatment, if any, of the disposal facility. Bioremediation and Incineration would achieve significant long-term effectiveness through destruction of contaminants.

Implementability. All action alternatives are implementable. Incinerator capacity my affect the timing of the Incineration alternative.

Cost. Bioremediation would be the least expensive of the action alternatives at $7.4 million. Off-site Disposal is estimated at $11.2 million and Incineration would be the most expensive alternative at $39.2 million.

Community Acceptance. No Action would not be acceptable to the community. All action alternatives would be acceptable.

State Acceptance. No Action would not be acceptable to the State. All action alternatives would be acceptable, but the

State would prefer an alternative that treated the waste on site and not transfer it to another site.

Remedy Selection Rationale

All of the action alternatives would be protective, effective, and implementable. Bioremediation and Incineration offer greater effectiveness and permanence through a significant reduction in TMV. Implementability of Incineration could be hampered by available incineration capacity. Bioremediation would be the least costly action alternative at $7.4 million making it the cost-effective alternative. Off-site Disposal would cost $11.2 million while Incineration would cost $39.2 million. Bioremediation would also be acceptable to the community and State.

8.5.3 SURFACE SOILS CONTAMINATED WITH INORGANICS AND ORGANICS

Alternatives Assessed

- o No Action (No Action)
- o Excavation and Off-site Disposal (Off-site Disposal)
- o Excavation, Bioremediation, Fixation, and On-site Disposal (Bioremediation/Fixation)
- o Excavation and Off-Site Incineration and Disposal (Incineration)
- o Capping

Criteria Assessment

Overall Protection of Human Health and the Environment. No Action would not be protective. Off-site Disposal would transfer the risk to another facility. Degree of protectiveness would be dependent on treatment (if any) and integrity of the disposal facility. Bioremediation/Fixation would destroy the organics and contain the inorganics providing protectiveness at the site. Incineration would destroy the organics and transfer the risk related to the inorganics to another facility. Capping would be protective of surface water and direct contact risk but would not be protective of groundwater.

Compliance with ARARs. No Action would not comply with ARARs. Off-site Disposal, Bioremediation/Fixation, and Incineration could be implemented to address ARARs. Capping would not address groundwater protection ARARs.

Reduction in Toxicity, Mobility or Volume (TMV). No Action would not result in any TMV reduction. Off-site Disposal would reduce mobility at the site, but depending on treatment, would not reduce toxicity nor volume. Bioremediation/Fixation and Incineration would reduce volume of soil contaminated with organics. Fixation would reduce mobility of inorganics. Volume of soil contaminated with inorganics would remain the same for all alternatives. Capping would reduce surface mobility, but not groundwater mobility. Capping would not reduce volume of soils contaminated with organics.

Short-term Effectiveness. The action alternatives could be implemented to be protective of workers and the community during remedial action.

Long-term Effectiveness and Permanence. No Action would offer no long-term effectiveness. Off-site Disposal would transfer the risks to another facility where long-term monitoring would be necessary. Bioremediation/Fixation would be effective in reducing long-term risks due to the organic component. Long-term management of the fixed soils would be necessary. Incineration would destroy the organic fraction but the risks afforded by the inorganics would be transferred to another facility. Long-term maintenance of the cap would be necessary to provide surface protection. Groundwater would continue to be affected in the long-term under the Capping alternative.

Implementability. All of the action alternatives appear to be implementable. Capacities of the off-site landfill to receive the wastes or the off-site incinerator to treat the waste could affect implementation schedule. Groundwater protection ARARs could prevent implementation of the Capping alternative.

Cost. Capping would be the least expensive alternative at $3.6 million. Bioremediation/Fixation would be the cost effective alternative at $8.3 million because it offers significant TMV reduction and protectiveness when compared to Capping. Off-site Disposal would cost $10.9 million while Incineration is estimated at $32.2 million.

Community Acceptance. No Action and Capping would not be acceptable to the community. All of the action alternatives would be acceptable to the community.

State Acceptance. No Action and Capping would not be acceptable to the State. The State would prefer a remedy that treated the contaminated soil at the site and did not transfer it to another facility.

Remedy Selection Rationale

Excavation, Bioremediation, Fixation and On-Site Disposal has been selected as the remedy for soils contaminated with inorganics and organics because it reduces the organic contamination, treats inorganic contamination, reduces TMV, and provides protectiveness in a cost-effective manner.

8.5.4 GROUNDWATER AND SUBSURFACE SOILS CONTAMINATED WITH CREOSOTE AND GROUNDWATER CONTAMINATED WITH ARSENIC

Alternatives Assessed

- o No Action (No Action)
- o Groundwater Extraction, Biological Treatment of Organics, Chemical Treatment of Inorganics (Biological Treatment)
- o Groundwater Extraction, UV or Carbon Treatment of Organics, Chemical Treatment of Inorganics (UV or GAC Treatment)

Criteria Assessment

Overall Protection of Human Health and the Environment. No Action would not be protective of human health or the environment. Biological Treatment could be equally protective as ultraviolet light (UV) or granulated activated carbon (GAC) in treatment of organics, but careful monitoring and operations would be necessary to prevent system upsets that would reduce organics destruction efficiency. The use of Biological Treatment coupled with UV or GAC polishing may be necessary to ensure protectiveness. Careful monitoring and maintenance of the UV or GAC systems would also be necessary.

Compliance with ARARs. No Action would not comply with groundwater protection ARARs. Biological Treatment and UV or GAC treatment could be implemented to comply with ARARs.

Reduction in Toxicity, Mobility, or Volume. The No Action Alternative would not result in a reduction in TMV. Biological Treatment and UV Treatment would destroy organics and chemical treatment would significantly reduce the volume of media contaminated with inorganics. GAC Treatment would reduce the volume of contaminated media, but would not destroy organics unless the GAC was regenerated through thermal destruction of the organics.

Short-term Effectiveness. Biological Treatment and UV or GAC Treatment could be implemented to be protective of workers and the community during implementation.

Long-Term Effectiveness. Biological Treatment and UV or GAC Treatment would provide significant long-term effectiveness through extraction, removal, destruction of contaminants and long-term containment of residuals.

Implementability. Both action alternatives are implementable. ARAR considerations would preclude implementation of the No Action alternative.

Cost. The Biological Treatment alternative would cost $17.4 million to implement. The UV or GAC Treatment alternative would cost $19.6 million to implement.

Community Acceptance. No Action would not be acceptable to the community. Either action alternative appear acceptable to the community.

State Acceptance. No Action would not be acceptable to the State. Either action alternative would be acceptable to the State if discharge limitations met ARARs and no direct discharge to surface waters were allowed.

Remedy Selection Rationale

EPA has selected Groundwater Extraction, Biological Treatment of Organics, Chemical Treatment of Inorganics as the remedy for groundwater because existing data show it to be effective in reducing contaminant levels to health standards and it is less costly than the UV or GAC alternatives. EPA does recognize, however, the Biological Treatment alternative may have to be combined with a UV/Ozone or GAC polishing treatment to provide additional assurance of effectiveness and protectiveness.

8.5.5 SURFACE WATERS

The surface soil remedies identified above will prevent further releases of wood treatment chemicals from the site. The reconstruction of the site following contaminated soil removal will include surface water control and containment structures to prevent releases during subsequent operation of the facility. Additional on-site measures are not warranted. EPA is proposing to excavate and remove from site drainages all sediment with detectable levels of wood treatment chemicals. No remedy for Beaughton Creek is proposed until additional data on the stream indicate the necessity for such. If contamination is detected in Beaughton Creek above levels deemed acceptable by the state and EPA, remedial measures will be taken.

9.0 SELECTED REMEDIES

The following text presents the selected remedies for soils contaminated with inorganics only, organics only, and with both organics and inorganics; groundwater; and surface water. All costs presented in this ROD are present worth costs. All remedies will be performed to address either a 1×10^{-5} or greater risk level, or background (non-detect) levels where achievable for organics and inorganics in water. Remedies for organics and inorganics in soils will address a 1×10^{-5} or greater risk, level non-detection, health-based or other regulatory standards.

9.1 REMEDY FOR SOILS CONTAMINATED WITH INORGANICS

REMEDY DESCRIPTION

For soils contaminated with inorganics only, EPA proposes to excavate the soil, fix it with a cement-based compound, and maintain the mixture onsite to prevent future exposure or movement. In order for this remedy to be implemented, arsenic leachate concentrations must be reduced below the 40 CFR 268 TCLP level of 5.0 ppm. Fixed soil exceeding CCR Title 22 TTLC/STLC criteria will be placed in lined cells. Fixed soil meeting TTLC/STLC criteria will be placed back onto the site, possibly forming the structural and operational base for wood treatment operations.

Excavation would be performed using conventional earth moving equipment. The base surface of the site would be graded and prepared to accept the fixed soil mixture. If the stabilized soil mass is intended to provide a base for wood treatment operations, the design could include structural and stability considerations. Included in the design would be surface runoff control considerations. Because the fixed soils would contain wood treatment chemicals, collection of leachate generated from the fixed soils and long-term monitoring will be required. Proper handling and disposal of leachate will be necessary. A liner below the fixed soil will be required for soils containing arsenic greater than 500 ppm, chromium greater than 500 ppm, copper greater than 2,500 and zinc greater than 5,000 (California Title 22 TTLC criteria). A liner also will be required if leachable arsenic and chromium exceeds 5.0 ppm, copper 2,500 ppm, and zinc 5,000 ppm. Deed restrictions will be required for all areas where treated waste has been deposited. Long-term groundwater and surface water monitoring would be required to demonstrate protectiveness of the alternative.

The inorganic soils cleanup will reduce arsenic to its background levels (i.e., 8 ppm for arsenic). Because the contaminants are commingled, this remedy will also remove the low level threat contaminants to below their proposed treatment standards. For those isolated areas where chromium, copper, or zinc are elevated in the absence of elevated arsenic, these contaminants will be excavated to the California Title 22 TTLC standards (Tables 4-1 and 4-3).

It is estimated that 18,750 cubic yards of soils contaminated with inorganics will be fixed with this remedy. It is estimated that remedial objectives will be achieved in approximately 9 months, if done continuously. Capital costs have been estimated at $4,525,800. Operating costs, including groundwater sampling, surface water monitoring, yearly inspection and maintenance, and surface repair, have been estimated at $223,000. Total costs are approximately $4,748,800.

REMEDY SELECTION RATIONALE

The selected remedy provides the best balance of the five NCP balancing criteria (long-term effectiveness and permanence; reduction in toxicity, mobility, or volume through treatment; short-term effectiveness; implementability; and cost). This alternative uses permanent solutions and an alternative technology or resource recovery to the maximum extent practicable. Cost for the technology is lower than off-site disposal and is comparable to capping of the soils in place. The alternative also provides the best long-term and short-term effectiveness; and permanently and significantly reduces the toxicity, mobility, or volume of hazardous substances through treatment; and is readily implementable at the site. It is protective of human health and the environment, complies with federal and State ARARs, and is cost-effective.

The goals of the remedy for soils contaminated with inorganics are to prevent surface water runoff of contaminated surface soils, to prevent air emissions of contaminated dusts, and to prevent contaminants from leaching into the groundwater, which is a drinking water aquifer at this site. Based on information obtained during the remedial investigation and on a careful analysis of all remedial alternatives, EPA and the State of California believe that the selected remedy will achieve these goals through proper implementation and monitoring of the action. The selected soil remedy will be coupled with groundwater extraction and treatment to remedy groundwater already impacted by the contaminated soils. The removal and treatment of contaminated soils may significantly reduce the time required for extraction and treatment of groundwater contaminated with inorganics. The point of compliance will be all site surface soils within the approximate 0 to 24 inch interval containing inorganic contamination above the clean-up standards.

Periodic groundwater, surface water runoff, and air quality monitoring and sampling of leachate will be required to determine the effectiveness of this remedy and to verify achievement of cleanup levels. Long-term operation and maintenance (O&M) activities for the treated soil mass, institutional and engineering controls, and their costs will also be required. Such requirements and a specific monitoring program will be defined more precisely during the RD/RA phase.

ARARs

The selected remedy will comply with all federal and State ARARs as listed in Tables 8-1 and 8-2, and the treatment standards stated in Table 4-1. Health-based ARARs pertaining to soil contaminated with inorganics are not available for the site. The soil contamination will therefore be reduced to health-based standards discussed in Section 4.0 that no longer pose a threat to surface water, groundwater, or air.

Soil will be excavated to background levels for arsenic, and to California Title 22 TTLC levels for chromium, copper and zinc. The soil will be treated to reduce leachability of arsenic and chromium to 5 ppm (leachate), which represents the TCLP and STLC limits for these metals. Copper and zinc leachability will be reduced to 25 ppm and 250 ppm, respectively, which represent the State Title 22 limits for these metals.

Treated soils will be placed as necessary in lined-treatment cells designed to meet RCRA land disposal requirements. Assuming that fixation of soil reduces arsenic leachate concentrations to below the TCLP standard of 5.0 ppm, the land disposal restrictions of Subtitle C of RCRA are not an ARAR for this remedy. The treatment technology used will reduce leachability of contaminants to below the land disposal requirements. Once treated, the soil will no longer be a RCRA-characteristic waste as long as leachability of the fixed soil meets the treatment standards.

9.2 REMEDY FOR SOILS CONTAMINATED WITH ORGANICS

REMEDY DESCRIPTION

For soils contaminated with organics only, EPA proposes that the soil be excavated and placed into lined land-treatment cells. The liner would be necessary to prevent contaminated leachate from moving into surrounding soil and the groundwater below. The liner would be designed to collect and monitor leachate concentrations; the collected leachate would either be placed back on the land-treatment unit or treated in the groundwater treatment system.

Soil would be treated using natural microbial populations, the effectiveness of which would be enhanced through the mixing of nutrients and fertilizers into the soil. The soil would be regularly tilled to mix the fertilizers, and to aerate and expose the soil to sunlight. The soil would be irrigated regularly to maintain a proper moisture level.

The soil within the treatment unit would be sampled at specific intervals to monitor the rate of biological degradation and to verify the achievement of the treatment standards through leachability tests for contaminants of concern, primarily PAHs. This remedy will treat all principal and low level threat contaminants to their respective treatment standards. Once the treatment standard is achieved and the soil considered treated, another layer of soil would be placed over the treated soil. The next layer would be treated as described above. When the soil layers reach the approximate level of ground surface, (approximately 8 feet of treated soil) the unit will be closed. Closure will be accomplished by placing an elevated "soft" cover of clean soil material over the treated soil. A vegetation cover will be established over the cover soils. Long-term leachate collection and groundwater monitoring would be included as part of closure requirements.

It is estimated that 12,500 cubic yards of creosote contaminated soils will be excavated and treated with this remedy. The point of compliance will be all site soils between 2 feet and the depth below the surface where groundwater interferes with excavation. This depth could vary between 5 feet and 12 feet depending on the time of year excavation takes place. Below the groundwater table, creosote above the excavation standards will be removed through the groundwater extraction system, or treated in situ if studies show this feasibility. It is estimated that the treatment standards will be achieved in 10 years. Capital costs have been estimated at $5,487,300. Operating costs, including air monitoring, soil sampling, groundwater sampling, surface water monitoring, yearly inspection and repairs, and bioremediation (i.e., labor and materials), have been approximated at $1,883,500. Total costs are approximately $7,370,800.

REMEDY SELECTION RATIONALE

Bioremediation of creosote contaminated soils is the selected remedy for this site. The selected remedy provides the best balance of tradeoffs with respect to the five balancing criteria. This alternative uses permanent solutions and alternative technology or resource recovery technology to the maximum extent practicable. The alternative is the least expensive of the alternatives for soils contaminated only with organics, and is at least equal to the other alternatives in terms of short- and long-term effectiveness. The alternative employs treatment as the principal element that will significantly reduce toxicity, mobility, or volume of contaminated media, and is readily implementable. It is protective of human health and the environment, complies with federal and State ARARs, and is cost-effective.

The goal of this remedial alternative is to remove all soil contaminated with creosote to protect groundwater, surface water, and human health, and to treat the soil biologically to destroy the toxic components of creosote. Residuals will be contained in a lined cell which will afford long-term protectiveness. Based on information obtained during the remedial investigation and on a careful analysis of all remedial alternatives, EPA and the State of California believe that the selected remedy will achieve this goal. The selected remedy will be coupled with groundwater extraction and treatment to address the effects of the current contamination on the local aquifer. The groundwater remedy is discussed in Section 9.4.

Residuals will remain in lined cells which will have leachate collection systems, lysimeters, and monitoring wells to identify leachate production and potential leaks from the cells. Maintenance of the cells will be necessary as long as contaminated leachate is detected. The leachate collected will be handled, treated or disposed of properly. Lysimeter and groundwater monitoring of the cells will also be performed as long as contaminated leachate is detected in the cells. All maintenance and monitoring requirements will be identified more precisely during the RD/RA phase.

<u>ARARs</u>

As noted above, this alternative would comply with all federal and State applicable or relevant and appropriate requirements as listed in Table 8-1.

The treatment standards selected for the soils contaminated with organics are presented in Table 4-1. These treatment standards were selected by the process below. There are no promulgated treatment standards for soils contaminated with creosote compounds. Soil will be excavated to a 0.5 ppm carcinogenic PAH soil level which represents the 1×10^{-6} risk level and also the analytical detection limit. EPA has determined that excavation to this level is readily achievable. EPA is proposing to treat the soil to reduce leachability of creosote compounds to a 5 ppb leachate concentration (detection limit) for carcinogenic PAHs and 0.150 ppm for non-carcinogenic PAHs. This level is based on guidance provided in 40 CFR 268 Subpart B. The land disposal restrictions of Subtitle C of the RCRA will provide guidance for implementation of this remedy. Soils will be treated to reduce total and leachable creosote concentrations to levels addressed in 40 CFR 268, although these levels are not specifically ARARs for the source of contamination. Once the soils are treated and leachate controlled, all substantive requirements of RCRA will be addressed.

9.3 REMEDY FOR SOILS CONTAMINATED WITH BOTH INORGANICS AND ORGANICS

REMEDY DESCRIPTION

This proposed alternative would involve the excavation of contaminated soil and biological treatment to reduce or destroy organic contaminants (as described in the section 'Remedy for Soils Contaminated with Organics'). The treated soil would then be fixed with a stabilization agent to control mobility of the inorganics and residual organics (as described in the section 'Remedy for Soils Contaminated with Organics'). The treated and fixed soil would then be placed back into lined cells in a manner protective of human health and the environment.

Treatment to reduce organic levels would be required because pilot studies indicate that the organics cannot be immobilized in the fixed mass when they exist in high concentrations. Residual dioxin levels are expected to be fixed and immobilized in the stabilized soil.

The organic and inorganic soils cleanup will reduce contaminant levels to those stated in Section 9.1 - Remedy for Soils Contaminated with Organics and Section 9.2 - Remedy for Soils Contaminated with Inorganics.

An estimated 9,375 cubic yards of organic and inorganic soils will be treated with this remedy. It is estimated that remedial objectives will be achieved in approximately 10 years. Capital costs have been approximated at $6,648,500. Operating costs, including air monitoring, soil sampling, groundwater sampling, surface water monitoring, yearly inspection and repairs, and bioremediation (i.e., labor and materials), have been estimated at $1,642,000. Total costs are approximately $8,290,500.

REMEDY SELECTION RATIONALE

Biological treatment of soils to reduce creosote and pentachlorophenol contamination followed by fixation of the residuals to reduce leachability of inorganic and remaining organic contaminants is the selected remedy because it provides the best balance of tradeoffs with respect to the five balancing criteria. This alternative will treat all inorganic and organic principal and low level threat contaminants to their respective treatment standards. This alternative uses permanent solutions and alternative technology or resource recovery technology to the maximum extent practicable. Although the alternative is more costly than capping soils in place, it is significantly less costly than other treatment alternatives. The alternative provides the best long-term and short-term effectiveness, permanently and significantly reduces the toxicity, mobility, or volume of the hazardous substances through treatment, and can be implemented at the site. The remedy employs treatment as a principal element that significantly and permanently reduces the toxicity, mobility, or volume of hazardous substances. It is protective of human health and the environment, complies with federal and State ARARs, and is cost-effective. The costs of this alternative are proportional to its overall effectiveness.

The goal of this remedial action is to treat and contain contaminated soils contributing to surface water, groundwater, and air contamination, and to protect human health and the aquatic environment. The aquifer at the site is a potential drinking water source and surface water is used by cattle and wildlife, and supports a viable sport fishery. Based on information obtained during the remedial investigation and on careful analysis of all remedial alternatives, EPA and the State of California believe that the selected remedy will achieve this goal. Point of compliance for the remedy will be all surface and near surface soils with inorganic and organic contamination above the clean-up standards. Maintenance and monitoring at the disposal cells including leachate collection, and lysimeter and groundwater monitoring will be required to ensure protectiveness of the remedy.

ARARs

As noted above, this alternative would comply with all federal and State applicable or relevant and appropriate requirements (ARARs) as listed in Tables 8-1.

Health-based ARARs specific to soils at the site exist for arsenic (leachable), pentachlorophenol (leachable) and dioxins (leachable and total). Health-based ARARs do not exist for PAHs, but guidance presented in 40 CFR 268 and the results of the risk assessment defining a 1×10^{-6} risk level were used for carcinogenic PAHs. The treatment standards for the soils remedy are presented in Table 4-1. Soils will be excavated to background levels for arsenic, and to 0.5 ppm for carcinogenic PAHs, 17 ppm for pentachlorophenol, and 1 ppb for dioxins. EPA believes that these levels are achievable using standard excavation technologies. Soils contaminated with these organics will be biologically treated to reduce leachate concentrations of carcinogenic PAHs to 5 ppb and pentachlorophenol to 1.7 ppm. The carcinogenic PAH level is based on practical analytical detection limits. The pentachlorophenol level is based on the CCR Title 22 STLC standard. EPA believes that these levels are achievable using biological treatment. The biologically treated soil will then be fixed to reduce leachability of inorganics, residual organics, and dioxins. The treatment level for arsenic is 5 ppm and 1 ppb for dioxins in leachate, which represent the TCLP levels for these contaminants. Leachate levels for PAHs and pentachlorophenol for fixed soil will remain at 5 ppb and 1.7 ppm, respectively.

The land disposal restrictions of Subtitle C of RCRA are not an ARAR for this remedy. All contaminants will be treated to levels below that governed by these restriction. Once treated, the soil will no longer be a hazardous waste and thus not subject to RCRA regulations. The fixed soil mass will contain hazardous substances and will be maintained and managed to remain protective of human health and the environment.

9.4 REMEDY FOR CONTAMINATED GROUNDWATER

REMEDY DESCRIPTION

For contaminated groundwater, EPA proposes extraction, biological treatment, chemical treatment, and discharge. Groundwater will be treated to achieve EPA clean-up goals prior to reuse or release from the site. EPA proposes to use a biological treatment process which passes contaminated groundwater through plastic discs covered with naturally occurring microorganisms. The microorganisms use the organic contaminants for food and energy, converting them to carbon dioxide and water.

Arsenic and other inorganic contaminants will be removed from the extracted groundwater using a chemical precipitation process. By adding lime to the extracted groundwater, a sludge is formed that settles to the bottom of the treatment tank. Solids created by the treatment processes are filtered and removed for proper disposal. The solids will contain elevated arsenic and other site chemicals and will be handled as a hazardous waste.

Both treatment processes may need to be coupled with a final treatment step to reach clean-up standards. This could involve the use of activated carbon or UV/ozone destruction to remove any remaining organic compounds and activated alumina or ion exchange to remove remaining arsenic.

Groundwater treated to health-based standards will be disposed of through various means. The disposal options include discharge to groundwater, use by industrial processes, use for irrigation, release to subsurface drains or trenches, and disposal to percolation/evaporation ponds. EPA is proposing to use the log-deck sprinkler system and reinjection into the contaminated aquifer as the primary disposal methods of treated groundwater. Point of compliance for these disposal options will be effluent as it leaves the treatment plant. During the winter months, EPA will use percolation/evaporation ponds to dispose of effluent. EPA will require specific proposal from the potentially responsible parties (PRPs) before approving any disposal option.

EPA is not including in this ROD direct discharge to Beaughton Creek as a disposal option. EPA will work closely with the RWQCB and the PRPs in identifying treated water disposal options agreeable to all parties affected by this decision.

This groundwater alternative will reduce contaminants to their corresponding clean-up standards. Dioxins and furans will be reduced to currently available detection limits (i.e., 25 ppq for both). The clean-up goals for dioxins and furans are 2 ppq, but this level cannot be detected with today's analytical methods. For benzene and carcinogenic PAHs, clean-up goals will be reached that correspond to a one-in-one million excess cancer threat (i.e., 1 ppb for benzene and 5 ppb for carcinogenic PAHs). For arsenic, the clean-up standard of 5 ppb reflects the 1×10^{-5} excess cancer threat. For non-carcinogenic PAHs, zinc, and chromium, clean-up will achieve background levels of 8 ppb for chromium, 90 ppb for zinc and 5 ppb for non-carcinogenic PAHs (detection limit). Point of compliance for the remedy will be the entire aquifer adjacent to and below the site. Definition of plume extent and compliance with the groundwater standards will be demonstrated through a network of monitoring wells and piezometers. The remedy will treat all principal and low level threat contaminants to their treatment standards.

An estimated 150,000 gallons of contaminated water will be treated per day with this remedy. Remedial objectives will be achieved in approximately 30 years. Capital costs have been approximated at $4,315,800. Operating costs, including labor, utilities, nutrients, inorganic chemicals, activated carbon, non-exchange replacement, salt, analytical, sludge disposal, supplies, and replacement parts have been estimated at $13,103,200. Total costs are approximately $17,419,000.

At the time of development of this Record of Decision, the existing pilot groundwater treatment plant had not been tested at design capacity and the effectiveness of the facility, as designed, in removal of organics, and inorganics had not been demonstrated. EPA will allow the PRPs one year from the signing of the Consent Decree to modify the facility and treatment scheme to achieve the standards presented in Table 4-1. Specifics of how the PRPs will be allowed to demonstrate performance of the facility will be included in the Consent Decree.

REMEDY SELECTION RATIONALE

Groundwater extraction followed by treatment and release or reuse of the extracted groundwater is the selected remedy for the site. The selected remedy provides the best balance of the five balancing criteria. This alternative uses permanent solutions and alternative technologies to the maximum extent practicable. As the groundwater extraction and treatment alternatives varied only in the type of treatment to be employed, costs for all action alternatives were approximately the same. The selected remedy is more cost-effective with biological destruction of contaminants, as the subsequent handling and treatment of concentrated residuals (i.e., as would be necessary through activated carbon treatment) is eliminated. This alternative provides the best long-term and short-term effectiveness, permanently and significantly reduces the toxicity, mobility and volume of hazardous substances through treatment, and can be implemented at the site. The selected remedy employs treatment as a principal element that significantly and permanently reduces toxicity, mobility, or volume of the hazardous substances. It is protective of public health and the environment, complies with federal and State ARARs, and is cost-effective. The costs of this alternative are proportional to its overall effectiveness.

The goal of this remedial alternative is to restore groundwater to its beneficial uses, which is a potential drinking water source for this site. Based on information obtained during the remedial investigation and on a careful analysis of all remedial alternatives, EPA and the State of California believe that the selected remedy will achieve this goal. The selected remedy will require contaminated soil removal and treatment to achieve this goal in a timely manner. Due to the extent of subsurface contamination, the selected remedy is expected to take at least 30 years to be accomplished. During this time, the system's performance will be closely monitored on a regular basis and adjusted as warranted by the performance data collected during its operation.

Periodic groundwater monitoring will be required to determine the effectiveness of the remedy and to verify achievement of the clean-up standards. Long-term operation and maintenance (O&M) activities, institutional and engineering controls, and their costs will be required. Such requirements and a specific monitoring program will be defined precisely as the Consent Decree is developed.

<u>ARARs</u>

This alternative will comply with all Federal and State applicable or relevant and appropriate requirements (ARARs) as listed in Tables 8-1 and 8-2.

The groundwater remediation and treatment standards selected for the groundwater remedy are presented in Table 4-1. These standards were selected by the process described below. As per Section 300.430(e) of the NCP, Federal MCLGs, where promulgated, were initially selected as the treatment standards. In the event that the MCLG has been set at a level of zero, then the federal MCLs, where promulgated, or the 1×10^{-5} to 1×10^{-6} risk range, which ever were more restrictive, were selected. In the event that a more stringent MCL has been promulgated by the State of California, then the State MCL was selected as the treatment standard. The selected remedy will achieve the treatment standard in the entire aquifer below the site and in the effluent discharged from the treatment unit if the effluent is used for non-industrial purposes.

For arsenic, pentachlorophenol, benzene, and dioxins, the treatment standard represents the 1×10^{-5} to 1×10^{-6} risk range for these contaminants. For carcinogenic and non-carcinogenic PAHs, the treatment standard represents practical analytical detection limits. For chromium and zinc, the treatment standard represents either background or the health based standards as determined by the reference dose levels for each contaminant. All of these contaminants were detected in groundwater at levels exceeding their treatment standards.

The land disposal restrictions of Subtitle C of the RCRA are not an ARAR for this remedy. The treatment technology used in the selected remedy will treat contaminated groundwater to either background or non-detectable levels. Once the groundwater is so treated, it no longer contains hazardous waste and no longer is subject to regulation under Subtitle C of RCRA.

9.5 REMEDY FOR SURFACE WATER

To prevent contamination of surface water, EPA proposes to treat and/or isolate the contaminated soils as described in the three contaminated soils remedies (i.e., inorganic, organic, and combined inorganic and organic). These remedies will prevent or greatly reduce contact between surface water and contaminated soil, thereby preventing or minimizing surface water contamination. Rationale and ARARs for the soils remedies are discussed above. EPA is not proposing a sediment remedy for the perennial portions of Beaughton Creek or its tributaries until further data and consultation with the California Department of Fish and Game result in the need for further action.

9.6 CONCLUSION

All remedies identified in this Record of Decision will reduce the residual risk for each contaminant in soil, sediment, and groundwater at the site to the 1×10^{-5} to 1×10^{-6} risk range. The greatest residual risk will relate to the background concentration of arsenic in soil and groundwater which reflects a 1×10^{-5} risk.

The proposed remedies mentioned in the preceding sections may need to be modified as a result of the remedial design and construction process. The changes, in general, reflect alterations made during the remedial design phase and will be performed so that standards state in Table 4-1 can be met and that the remedies will remain protective and effective.

10.0 STATUTORY DETERMINATION

The selected remedies are protective of human health and the environment as required by Section 121 of CERCLA. Existing or potential risks from exposure to soils, surface water, sediment and groundwater will be eliminated, reduced, and controlled by treating contamination, stabilizing contamination, and containing contaminants. Remedial objectives will reduce excess cancer risks to 10^{-6} when possible (if background levels of chemicals do not exceed this risk level), which is within the 10^{-4} to 10^{-6} risk range. Risks from non-carcinogens will be reduced to hazard indices less than one. All principal and low level threat contaminants will be addressed by the proposed remedies. During the implementation of the remedies, engineering controls such as dust control measures will be employed to ensure that no unacceptable short-term risks or cross-media impacts occur.

The remedies selected will comply with ARARs. The remedies selected will meet Safe Drinking Water Act MCLs and the California DHS Applied Action Levels for drinking water.

The remedies for contaminated soil will comply with the RCRA Land Disposal Restrictions (LDRs). Concentrations of contaminants within leachate generated from the waste will comply with 40 CFR 268 requirements.

The remedy for groundwater will comply with the state well installation regulations, water treatment facility siting and operation regulations, and worker protection regulations.

The discharge of treated effluent will comply with ARARs and, to the extent possible, TBCs.

During implementation of the remedies, the substantive requirements of the Siskiyou County Air Pollution Control District will be met.

The aforementioned protectiveness and compliance with environmental requirements is achieved in a cost effective manner. The alternatives chosen are the cost effective approaches available to achieve the necessary degree of protectiveness. Residual risk which will be related to background levels will be 1×10^{-5}.

The selected remedies use permanent solutions and alternative technologies to the maximum extent possible, and satisfy the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element.

The clean-up standards defined in this Record of Decision are subject to re-evaluation with respect to effectiveness in protecting human health and the environment at the 5-year review period.

10.1 SOILS CONTAMINATED WITH INORGANICS

The proposed remedy, fixation and on-site disposal, will be protective through containment of the inorganics in the fixed soil mass. This alternative will involve treatment to reduce mobility. Toxicity and volume will not be reduced. Short-term effectiveness will be maintained through strict environmental controls. The alternative is implementable using standard equipment and materials.

The "No Action" alternative would not be protective because contaminants would continue to be released into surface water runoff and in airborne dust.

Excavation and off-site disposal would be protective through removal of contaminants. However, removal would not reduce the overall toxicity, mobility or volume of contaminants.

Capping would be only partially protective of groundwater. Mobility into groundwater would remain a concern.

10.2 SOILS CONTAMINATED WITH ORGANICS

The proposed remedy, excavation and on-site bioremediation, will be protective and permanent through destruction of organics and long-term containment of the residuals. Volume of contaminated material will be decreased and mobility controlled through containment in a lined cell. The alternative is implementable using available equipment and materials and demonstrated techniques. The alternative does not preclude movement of treated soils to an off-site disposal facility at a later time.

The "No Action" alternative would not be protective of human health and the environment because the contaminants would continue to be released from the site into the groundwater.

Excavation and off-site disposal would be protective of human health and the environment through removal of contaminants. However, removal would not reduce the overall toxicity, mobility, or volume of contaminants.

Excavation and off-site incineration would be protective, would reduce toxicity, mobility and volume, would be effective in the short term and long term, and would be implementable. However, the total cost of incineration is approximated at more than five times the cost of bioremediation.

10.3 SOILS CONTAMINATED WITH ORGANICS AND INORGANICS

The proposed remedy, excavation and on-site bioremediation followed by fixation to contain inorganics and on-site disposal, will be protective through biological destruction of organics and long-term containment of the residuals. The volume, toxicity, and mobility of organic contaminants will be reduced. The mobility, but not the volume or toxicity, of inorganic contaminants will be reduced. The alternative will be effective and protective during the short term through the use of strict environmental controls. The alternative is implementable using available equipment and materials and demonstrated techniques.

The "No Action" alternative would not be protective because the contaminants would continue to be released from the site into surface water, groundwater, and in airborne dust.

Excavation and off-site disposal would be protective through removal of contaminants. However, there would be no reduction in toxicity, mobility, or volume.

Excavation and off-site incineration would be protective through the nearly complete destruction of organics and the stabilization of the inorganics in the ash. This alternative would reduce organic toxicity, mobility, and volume. However, it would not reduce inorganic toxicity or volume. This alternative would be protective and effective in the short term through the use of strict environmental controls. Furthermore, the total cost of incineration is approximated at almost 4 times the cost of bioremediation/fixation.

Capping would only be partially protective of groundwater. Mobility into groundwater would remain a concern.

10.4 CONTAMINATED GROUNDWATER

The groundwater remedy, extraction followed by biological and chemical treatment, will be a permanent solution because the contaminants will be destroyed or removed from the groundwater. The groundwater remedy is expected to take 30 years to achieve treatment standards. Careful management of the process will be necessary for it to be effective in the short term. The alternative is implementable using readily available equipment and materials.

The "No Action" alternative would not be protective because contaminants would continue to remain in the groundwater.

The "UV or Granulated Activated Carbon Treatment of Organics" alternative offers the same risk reduction benefits as the proposed remedy. Treatment with activated carbon has the disadvantage that the spent carbon containing the organics would need to be regenerated or disposed of properly.

11.0 DOCUMENTATION OF SIGNIFICANT CHANGES

Surface soil clean-up standards for chromium, copper, zinc, pentachlorophenol, and carcinogenic PAHs have been revised since the issuance of the Proposed Plan. The revised clean-up standards for chromium of 500 ppm, copper of 2,500, and zinc of 5,000 represent the California Title 22 TTLC waste designation levels for these elements. The revised standard for carcinogenic PAHs of 0.5 ppm represents the 1×10^{-6} risk level for the contaminants. The revised clean-up standard for pentachlorophenol of 17 ppm reflects the California Title 22 hazardous waste designation level for the contaminant.

Leachate standards for copper, zinc, pentachlorophenol, and non-carcinogenic PAHs were also modified since issuance of the Proposed Plan. The leachate standards for copper of 25 ppm, zinc of 250 ppm, and pentachlorophenol of 17 ppm reflect the California Title 22 STLC waste designation levels for these contaminants. The non-carcinogenic PAH leachate level was revised to 1 ppm to be more consistent with criteria in 40 CFR 268.

Clean-up criteria for all contaminants in drainage sediments have been revised to reflect analytical detection limits for organics.

The groundwater clean-up standard for arsenic was revised to reflect a practical quantification limit of 5 ppb, which also reflects a 1×10^{-5} risk level. The groundwater standard for carcinogenic PAHs has been revised to 5 ppb, which also reflects the practical quantification limit for PAHs.

Finally, EPA has eliminated direct discharge to surface water as a disposal option for treated groundwater.

APPENDIX A

RESPONSE SUMMARY

SUMMARY OF COMMENTS
J. H. BAXTER SUPERFUND SITE
PROPOSED CLEAN-UP PLAN

A discussion of significant comments and issues related to EPA's Proposed Plan to clean up the J. H. Baxter site is presented below. A more detailed discussion follows this synopsis of significant comments.

Clean-up Goals - Rationale for Selection

EPA received several comments regarding the selection of the proposed clean-up goals for the site, particularly in reference to using the naturally occurring level, or "background", as the clean-up standard.

When selecting clean-up goals, EPA considered a number of factors, including health-based levels as determined by the site's endangerment assessment and by state and federal criteria. Background levels for the site were also considered. The site has two basic types of contaminants: inorganic contaminants and organic contaminants. The inorganic contaminants such as arsenic, chromium, copper, and zinc occur naturally in the site area and therefore have background levels. The organic contaminants such as the components of creosote, pentachlorophenol, tetrachlorophenol, and chlorinated dioxins/furans do not occur naturally at the site and thus do not have background levels.

For the inorganic contaminants, EPA selected health-based criteria as the starting point for site cleanup. The clean-up level identified for arsenic in soil is the background concentration of 8 parts per million (ppm) at the site. This corresponds to the health-protective level for arsenic of a 1 in 100,000 risk of cancer. The health-based level for chromium, another carcinogen, was identified at 570 ppm. EPA will be using 500 ppm as the clean-up standard for chromium to be consistent with the State of California's standards. Because copper and zinc are considered less toxic than arsenic and chromium, the clean-up standards are higher. It is important to note that all of the inorganic contaminants are mixed together in the soil and excavating and treating arsenic to background will essentially treat and remove the other inorganic contaminants to background levels. Because the proposed soil remedies will prevent movement of the inorganic contaminants in runoff or wind-blown dust, they will not threaten human health or the environment.

For the organic contaminants in soils, EPA's clean-up standards reflect health-based criteria for each contaminant or the analytical detection limit, if the health-based level cannot be detected by current EPA accepted methods. The exception is for pentachlorophenol where the State of California's standard of 17 ppm, which is more stringent than the health-based criterion, was selected. Like the inorganic contamination, the organic contamination is also mixed in the soil. Excavating and treating the carcinogenic components of creosote and the dioxins, which have the most stringent clean-up standards, will essentially remove the other organic contaminants as well. EPA will not allow detectable levels of these contaminants in runoff from the site.

EPA is proposing to pump contaminated groundwater to treat the water at a facility at the site. EPA has selected health-based standards as the goals for cleaning up the aquifer. EPA will require treating the water to health-based levels before releasing it for industrial or other uses. EPA will not be releasing treated water to Beaughton Creek or its tributaries. EPA will not allow reinjection into the groundwater of treated water that will reduce the quality of the aquifer at the site to below health-based standards.

Risk Assessment - Alternative Methods Proposed

The potentially responsible parties provided several comments related to the risk assessment methods used by EPA. They suggested an alternative approach that is less conservative than EPA's and proposed less stringent clean-up goals.

The risk assessment approach used by EPA at this site reflected the approach EPA used at Superfund sites during the mid to late 1980's. EPA's approach incorporates conservative assumptions because of future uncertainties related to land use and public access to the site. The alternative approach suggested by the commentors is not consistent with EPA's current risk assessment methods and thus cannot be considered.

Surface Water Discharge - Impacts to Beaughton Creek

EPA received a few comments expressing concern over the impact of discharging treated groundwater to Beaughton Creek. Beaughton Creek supports a viable fishery. Aquatic life, anglers, wildlife, and cattle could be affected by the discharge.

EPA has reconsidered the direct discharge water disposal option and will not be including at a part of the final remedy. EPA's disposal options for the treated groundwater are process water use, evaporation/percolation ponds, and reinjection into the contaminated portion of the plume.

Long-term Management of Treated Wastes - Why is This Necessary?

The inorganic contaminants exist in the soil in a concentrated state, and due to physical constraints they cannot be destroyed nor can their toxicity be significantly reduced. The selected treatment for the soils, which is fixation or solidification through mixing with cement, is intended to prevent the contaminants from continuing to leach from soils into groundwater and to prevent water-borne and wind-borne movement of contaminants. Because the contaminants will remain at the site in the fixed soil mass, the treated soils should not be disturbed or used for other purposes. Therefore long-term management will be required. The most contaminated soils will be placed in lined treatment cells constructed to capture any rain water that has come into contact with the fixed soils and has possibly dissolved some of the contaminants. This contaminated water or leachate will remain within the cells. Long-term management of these cells will be necessary to continue collection of leachate, to maintain integrity of the cells, and to prevent disturbance of the cells.

It may not be possible to completely destroy all of the organic contaminants using biological treatment. Therefore, the biologically treated soils will also be maintained in lined treatment cells to prevent direct contact or reuse of the soils as long as the organic contamination remains.

Effectiveness - Can EPA Achieve and Maintain Clean-up Goals using the Technologies Identified?

The remedies selected by EPA have been effective either during pilot studies at this site or at similar sites. EPA will continue to evaluate progress at this site to ensure that the remedies remain effective. Where necessary, EPA will modify the proposed remedies or add new clean-up steps so that clean-up standards are met.

Off-Site Contamination - What is EPA's Proposal?

EPA has performed extensive soils sampling in all areas around the site and has only detected significant contamination in site drainage areas on and off of the site. Where necessary, EPA will remedy the drainage contamination. EPA did not detect contamination in residential areas above health-based criteria and EPA is not proposing an off-site soil remedy at this time.

Schedule of Site Remedy - Can the Wood Treatment Plant Remain Open?

EPA received a few of comments related to its proposal to allow the wood treatment plant to remain open during site remedy. It is not EPA's intent to close the wood treatment plant during site remedy. EPA will determine a clean-up schedule that will allow continued operations. The proposed groundwater collection and treatment remedy will not affect or be affected by plant operations. The majority of surface soils contamination can be treated with minimal effects on plant operations. Only the remedy of subsurface soils below and next to the plant structures will potentially affect plant operations. EPA will include the treatment of these subsurface soils as part of its negotiated settlement with the responsible parties.

RESPONSE SUMMARY

The Proposed Plan for the J.H. Baxter site was issued to the public on April 27, 1990. The Proposed Plan described EPA's preferred remedial alternatives for contaminated soils, groundwater, surface water, and sediments at the site. At the time of issuance of the Proposed Plan, EPA announced that the public comment period would extend from May 1 through May 30, 1990. At the request of the potentially responsible parties (PRPs), the public comment period was extended to June 30, 1990. On May 7, 1990, EPA briefed citizens of the City of Weed on EPA's Proposed Plan at a public meeting.

SUMMARY OF COMMENTS RECEIVED

During the public comment period, EPA received comments from individuals within the local community, from public interest groups, from the North Coast Regional Water Quality Control Board, California Department of Fish and Game, the California Department of Health Services, and from the potentially responsible parties. Comments pertaining to elements of the Proposed Plan and EPA's responses to the comments are summarized below.

A. COMMENTS FROM COMMUNITY MEMBERS

Commentor: Mary Thomas
Date: May 9, 1990

1. Comment:

The commentor agreed with the proposed groundwater treatment remedy, but was concerned about discharge of treated water to surface waters or for irrigation.

1. Response:

EPA does not propose to release treated water to surface water or as irrigation water that would contain chemicals at levels harmful to humans, cattle, fish, or wildlife. All releases would meet the stringent State and Federal standards for protection of human health and the environment based on the discharge method employed. EPA would also require monitoring of any releases to ensure that protection of human health and the environment is maintained.

2. Comment:

The commentor agreed with the proposed soil treatment remedy, but requested clarification of the term "long-term management" of the treated soils. The commentor requested that the treated soils be capped after treatment.

2. Response:

The treatment remedy for soils contaminated with arsenic and other inorganics does not remove the contaminants, but binds them into a solid mass which prevents the contaminants from being washed or blown away, or move into the groundwater. The treated soils therefore must be placed in a location that will remain undisturbed in perpetuity or until a follow-on remedy is deemed necessary. The long-term storage unit which will contain the treated soils will be capped by a soil layer so that wind, rain, and surface water will not come in contact with the treated soils. By stating that treated soils will require long-term management, EPA is indicating that Federal, State, and local records for the site must be amended through deed restrictions to reflect that treated soils have been deposited on the site property, and that the storage unit into which the soils have been placed should not be disturbed.

3. Comment:

The commentor expressed a concern over the dust problem for the site due to the high wind conditions for Weed and asked whether the entire site should be capped.

3. Response:

EPA's proposed remedy for the site will involve the removal and treatment of all contaminated surface soil and the maintenance of the soil in a containment cell so that wind erosion is not possible. Baxter would be required to reconstruct the property so that release of contaminated dusts would not be possible. In recognition of the current dust problem, EPA is considering spraying the contaminated site soils with a non-toxic soil particle binding agent that will minimize dust releases until the final remedy is implemented.

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Public Meeting Comments
Date: May 7, 1990

1. Comment:

How does Love Canal compare with the Baxter site? If the Baxter site was discovered first, would there have been a similar public reaction to the Baxter site?

1. Response:

There is very little similarity between the J.H. Baxter and Love Canal Superfund sites. Love Canal primarily resulted from the construction of houses over former hazardous waste lagoons. At Love Canal there was a significant potential for daily direct contact with the hazardous wastes and therefore a more serious health threat was present. To EPA's knowledge, there are no records of waste disposal within the community or of residential construction over former waste disposal areas related to the J.H. Baxter site.

2. Comment:

What is the long-term management of the treated and fixed soils?

2. Response:

EPA proposes to place the treated soils into a containment cell designed to collect any contaminated liquids that may result from moisture contact with the treated soils. A soil cap will be constructed over the soils to prevent direct contact, surface water erosion, and wind erosion of the soils. EPA, in coordination with State and local authorities, will require institutional controls (such as deed restrictions) that will prohibit disturbance of the treated soil unit or cap. EPA will also require monitoring of any liquids produced in the soil containment unit and of the local groundwater to ensure that the remedy is effective in containing the contaminants. Long-term management will be necessary as long as the treated and fixed soils remain at the site.

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Commentor: Kenoli Oleari (Salmon River Concerned Citizens)
Date: June 30, 1990

1. Comment:

A discussion of historical difficulties and problems relating to J.H. Baxter's unwillingness to cooperate and to comply with clean-up orders should have been included in the Feasibility Study (FS) and Proposed Plan.

1. Response:

A discussion on the regulatory history for the site was included in the Remedial Investigation report and was not repeated in the FS. Although the State and EPA experienced a lack of cooperation by Baxter during the early stages of the RI/FS process, Baxter has shown a greater willingness to cooperate in more recent remedial studies and efforts. CERCLA requires that all potentially responsible parties (PRPs) be given an opportunity to participate in site cleanup. J.H. Baxter's obligations for the cleanup will be established in EPA's Consent Decree orders and Baxter will be required to meet its obligations or face a Federal lawsuit under the Superfund law.

2. Comment:

EPA should take over responsibility for cleanup from Baxter.

2. Response:

Baxter, IP, and Roseburg have all shown good faith responses to recent EPA and State requests for site remedial studies and interim actions. As long as these parties remain responsive, EPA will not take over the direct responsibility for cleanup. In addition, it is EPA's policy that in the situation where viable responsible parties are identified for a site, such as the Baxter site, EPA will not take over responsibility for cleanup. EPA will negotiate a Consent Decree with the viable parties which defines the scope of cleanup. EPA will oversee the cleanup, and sue any viable party who does not comply with the scope of cleanup established in the negotiated Consent Decree. Provisions and stipulated penalties provided in the Consent Decree are designed to prevent the potentially responsible parties from delaying or hindering the clean-up process. The Consent Decree will require the site remedies to be implemented in a manner that is protective of public health and the environment.

3. Comment:

Allowing Baxter to delay cleanup 3 to 5 years could expose the public to additional health risks over an unreasonable time period. A shorter clean-up period is requested to prevent this.

3. Response:

EPA must recognize the economic burden that implementing a remedy may have either on the facility directly involved or the local community supported by the facility. Implementing the remedy during a relatively short period could result in the temporary or permanent closure of the wood treatment plant, which is not one of EPA's goals. By allowing the remedy to occur over 3 to 5 years in a phased approach, Baxter can remain in operation and maintain current employment. The 3 to 5 year cleanup refers to Baxter property soils below the facility buildings only. EPA does intend to address the surface water runoff and dust emissions problems early in the remedial process to minimize the risks posed by these releases to the local community. The potentially responsible parties have installed one groundwater treatment plant on Roseburg's property and instituted a pilot program at the Baxter property to extract and treat contaminated groundwater. EPA will also review effectiveness of all remedies every 5 years and modify the remedies as necessary to ensure that they remain protective.

4. Comment:

A comprehensive program for offsite contamination investigation is critical and must be included as part of the cleanup plan.

4. Response:

EPA recently completed extensive soil sampling of residential areas adjacent to the Baxter property and determined that there is no soil contamination in these areas resulting from wood treatment activities. These results and the results of EPA's remedial investigation indicate that the only significant offsite contamination occurs in the drainage ditch that collects and transports surface water from the Baxter property. EPA intends to remove these contaminated sediments as part of the selected remedy. EPA is currently working with the Department of Fish and Game and the responsible parties in developing and implementing studies to evaluate impacts of past releases on Beaughton Creek. The Beaughton Creek studies will be implemented as part of the ROD. Creek remedies determined from the study results will be implemented as part of the ROD.

5. Comment:

Soil testing at the Weed High School is requested.

5. Response:

The Weed High School is hydrologically upgradient from the site. Therefore, groundwater and surface water from the high school flow towards the site area. Prevailing winds at the site flow parallel to the high school indicating that it is not downwind of the site. No soil samples collected between the high school and the site showed contaminants from wood treatment chemicals. EPA also tested the groundwater well the high school uses to irrigate the playing fields and found the water to be free of site chemicals. Therefore additional investigations of the high school area are not warranted.

6. Comment:

Local health surveys are requested to evaluate frequency of disease in the community that may be a result of site chemicals.

6. Response:

Under the Superfund process, public health surveys are the responsibility of the Agency for Toxic Substances and Disease Registry (ATSDR) in Atlanta, Georgia. EPA suggests that you contact ATSDR to discuss the process for requesting a public health survey for the Baxter site area. Inquiries should be addressed to: Director of Division of Health Assessments and Consultation, 1600 Clifton Road, Atlanta, GA 30333.

7. Comment:

The plan fails to address synergism between contaminants.

7. Response:

Scientific data regarding synergistic health effects of multi-contaminant exposures are currently in the early stages of analyses and quite inconclusive. In selection of clean-up levels to background concentrations for carcinogens, EPA has effectively addressed potential synergistic effects for all contaminants.

8. Comment:

Facilitated transport of dioxins caused by solvents may have resulted in widespread dioxin contamination.

8. Response:

Of the "solvents" mentioned by the commentor, pentachlorophenol and tetrachlorophenol, like dioxins, are solids and thus cannot act as a solvent. Benzene detected at the site was the result of a leaking underground storage tank that was not part of the wood treatment operation. In addition, the affected area is localized and the soil concentrations are insufficient to facilitate the transport of dioxins. The dioxin sampling performed at the site did not indicate contamination above health-based criteria offsite. Because dioxins tend to adsorb strongly to soil particles, transport of dioxins in dust and sediment is the primary transport concern. EPA is developing plans to prevent contaminated dust release and surface water erosion of contaminated site soils.

9. Comment:

The Feasibility Study and Cleanup Plan need to look at a broad range of health effects and to investigate the quality and applicability of studies they reference. Recent studies on pentachlorophenol show it to be a highly toxic carcinogen.

9. Response:

The Endangerment Assessment used as the basis to establish clean-up levels did consider all types of known health effects, including reproductive effects. All studies used in the assessment were published studies that had been subject to peer review. It is beyond the scope of a feasibility study to evaluate individual studies on technical merit. Pentachlorophenol was treated as a carcinogen in this study.

10. Comment:

The choice of a "background level" for arsenic contamination needs to be reevaluated because naturally occurring arsenic is less toxic than the type of arsenic used at the wood treatment facility. Cleanup of arsenic to non-detect levels is recommended.

10. Response:

In performing the endangerment assessment, EPA assumed that all arsenic present was in the most toxic form. Results of the assessment show that cleanup to 8 ppm (or background) will be protective of human health and the environment and additional assessment is not warranted. It is not feasible to clean up arsenic to non-detectable levels because it does occur naturally in soils and rocks at the site and the surrounding region.

11. Comment:

Cleanup of pentachlorophenol, dioxins, and carcinogenic polycyclic aromatic hydrocarbons (PAHs) to non-detect levels is also recommended.

11. Response:

The Endangerment Assessment performed by EPA indicates that clean-up of these chemicals to the levels presented in the Record of Decision will be protective of human health and the environment and further reduction is not warranted. For soils clean up to background for arsenic and the 1×10^{-6} risk level for carcinogenic PAHs has been chosen. For water, cleanup will be performed to 5 ppb for arsenic (1 x 10^{-5} risk level) and non-detect levels for all organics.

12. Comment:

The effectiveness of the fixation technology for inorganic soil contamination is questioned.

12. Response:

Although EPA recognizes that the use of pozzolonic materials to fix inorganic chemicals has a relatively brief history, the long-term durability and stability of pozzolins are well known. Treatability tests using cement as the binding agent showed that the inorganics were immobilized in the fixed mass. Therefore this technology was proposed. To ensure that the technology remains effective, EPA intends to place the fixed soils in a containment cell and monitor the cell for an extended period. Should results of the long-term monitoring indicate that the fixed mass loses effectiveness in preventing contaminant mobility, EPA will consider an alternative technology at that time.

EPA disagrees that the fixation alternative is too complicated to be effective. The alternative involves the use of commercially available fixative agents and standard earth moving and handling equipment. The technology employed is extremely simple with minimal opportunities for failure or "glitches".

The area selected for the fixed soil storage will be in a geologically stable location and at least 10 feet above the high groundwater table. EPA remains confident that the technology can be implemented and maintained in a safe manner. Data to support EPA's proposed remedy are provided in the Administrative Record, maintained in Weed and San Francisco.

13. Comment:

The effectiveness of the biological treatment process proposed for soils and water on the site is questioned and UV/Ozone treatment is proposed.

13. Response:

The FS contained results of treatability studies for this site which showed that biological treatment could be effective in reducing creosote and pentachlorophenol contaminant levels. Biological treatment has been employed at a number of wood treatment sites to treat groundwater and soils. EPA reviewed the results of a number of treatability studies before proposing biological treatment.

As stated in the FS, biological treatment of water may have to be coupled with a final polishing step using activated carbon or UV/ozone to achieve the final treatment levels to remove or destroy residual organic contaminants. EPA would prefer to use UV/ozone as the polishing step because it does not involve handling or disposal of large quantities of wastes as is required for activated carbon. EPA also considered using UV/ozone as the primary treatment technology, but it is more costly to operate and is subject to significant fouling at high creosote concentrations. EPA therefore proposed biological treatment as the primary treatment technology.

EPA considered UV destruction of organics in soils but did not propose this technology. The UV technology for soils requires significant materials handling and processing to be effective and soil can only be processed in small batches (e.g., 1 cubic yard). Due to the large quantities of soil involved (about 20,000 cubic yards), a technology that handles soils in large quantities is important. Biological treatment requires significantly less soil handling and processing, and can be performed on bulk soils. Costs and time to complete the soil treatment effort also favor biological treatment. Data to support EPA's proposed remedy are provided in the Administrative Record maintained in Weed and San Francisco. Appendix B of the ROD presents the Index to the Administrative Record.

14. Comment:

A concern is expressed that much of the cleanup activity relies on ongoing monitoring which requires cooperation of the parties involved in site cleanup. Alternative cleanup technologies that do not require intensive monitoring are suggested.

14. Response:

Any treatment technology employed at this site will require monitoring due to the nature and extent of contamination present. The technologies proposed by EPA reflect a required level-of-effort for monitoring that would not be any different from a required level-of-effort for any other technology. Because the Superfund law includes substantial penalties for failure by the responsible parties in complying with the monitoring efforts to be specified in the Consent Decree, EPA is confident that the required monitoring will be performed. All tests performed as part of monitoring will reflect EPA accepted procedures. Additional tests can be incorporated into the monitoring process as necessary as determined through the 5-year review procedure.

15. Comment:

Regular public meetings and information transfer on the progress of site cleanup will be important for the success of this effort.

15. Response:

EPA agrees that information will be regularly shared with the concerned community. Public information repositories located in Weed and San Francisco will be continually updated as new information becomes available. In addition, fact sheets and meetings will be used to keep the public informed on the progress of site cleanup.

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Commentor: Felice Pace (Klamath Forest Alliance)
Date: none provided

1. Comment:

The Proposed Plan indicated off-site contamination. Off-site contamination should be considered part of the site and be included within the Record of Decision.

1. Response:

EPA recently completed an extensive off-site soil sampling program in areas adjacent to the site and no contamination above naturally occurring background was detected in residential areas. One sample in Lincoln Park indicated chromium at 82 ppm, which is above the 40 ppm background level for this metal. However, this level is far below EPA's 1 x 10^{-6} risk level for direct contact by children, which is 570 ppm. Contaminated sediments within and adjacent to the site will be addressed in the ROD and included in the overall site remedy.

2. Comment:

Where possible, clean-up goals should be established at the natural background level for the contaminant.

2. Response:

For soils, EPA has proposed background as the clean-up level for arsenic, and levels near the analytical detection limits for carcinogenic PAHs and dioxins. Arsenic, carcinogenic PAHs, and dioxins are the primary contaminants of concern for the site and will drive the cleanup. Available data indicate that all site contaminants are commingled in soils. Therefore removal of arsenic and carcinogenic PAHs to background levels or near detection limits will also remove all site contaminants to near background levels. For groundwater contaminants, EPA has proposed clean-up levels as close to background as possible for the carcinogens. Contaminants are also commingled in groundwater and the treatment of water to remove the primary contaminants will also remove other contaminants to detection limits. Technological constraints may not allow clean-up or treatment to background using available water treatment technologies at this time, but the levels selected by EPA are considered protective of human health and the environment. EPA will periodically reevaluate the clean-up levels and response technologies and modify both as necessary so that the lowest achievable clean-up level, protective of health, can be met.

3. Comment:

Dangerous chemicals should not be discharged to surface water.

3. **Response:**

At this time, EPA is not proposing direct discharge to surface water as the disposal method for treated effluent. EPA has identified process water use by Baxter and Roseburg, primarily for use as spray water on the log decks, for disposal of the treated groundwater during late spring through fall months. Discharge of treated water to percolation/evaporation ponds will used during the winter months. Disposal of treated effluent to the surface water would be performed only in accordance with State requirements, which at present do not allow discharge of any treated effluent to surface waters.

4. **Comment:**

The Proposed Plan should contain a more thorough discussion of risks posed by chemicals at the site.

4. **Response:**

A detailed discussion of site risks is presented in the Endangerment Assessment. The purpose of the Proposed Plan is to describe EPA's proposed site remedy. Other relevant information such as that related to site risks is summarized in order to maintain a condensed fact sheet format. The Endangerment Assessment and other supporting documentation on site risks are available in the site's information repositories located at the College of the Siskiyous and at the Weed Library.

5. **Comment:**

An information repository in Yreka is recommended.

5. **Response:**

EPA once maintained an information repository in Yreka, but removed it when EPA discovered it was not being used. Information repositories remain in Weed and San Francisco.

6. Comment:

An explanation of why background levels cannot be feasibly attained with currently available technology is necessary.

6. Response:

For surface and near surface soils where excavation for subsequent treatment will be the first step in the site remedy process, removal to background levels of arsenic is readily achievable. The only limitation to excavation would be using analytical chemistry results to define the boundaries of the contaminated soil to be removed. All of the inorganic contaminants can be analyzed to their background levels in soils and therefore excavation to background is achievable. EPA proposes to excavate the carcinogenic organic contaminants to the non-detection level. The organic contaminants can be analyzed to the 500 parts per billion level which are concentrations considered protective of human health and the environment.

Soil excavation is proposed to go as deep as the top of the groundwater table (or about 5 to 12 feet below ground surface depending on the time of year). Although it is possible to excavate soils that are within the groundwater zone, these soils are saturated with water. The saturated soils lose the structural properties of dry soils and become more difficult to excavate and handle. Temporary dewatering of the proposed excavation area may allow the excavation to extend deeper than 12 feet, but the difficulty of dewatering the aquifer further and the need for shoring of the excavation, coupled with worker safety concerns for excavations in saturated soils, would prevent a deeper excavation.

For the deeper soils, pumping of contaminated groundwater is one means of removal of contaminants from the subsurface soils. All of the site contaminants have a stronger attraction to soil particles than they do for going into solution, therefore the contaminants tend to remain bound to the soil. Thus, removal of the contaminants through groundwater extraction may not be sufficient to remove the subsurface soil contaminants. Removal of the subsurface contaminants can be enhanced through the injection of flushing agents that detach the contaminants from the soils and allow them to move in the groundwater towards the extraction wells. The injection of nutrients into the groundwater could also encourage bacteria to consume the organic contaminants, also facilitating subsurface and aquifer cleanup.

Available technologies are adequate to allow treatment of organics in extracted groundwater to non-detection levels (about 5 ppb). Removal of inorganic contaminants to background levels in large volumes of water (it is estimated that up to 150,000 gallons per day may be treated at the site) is more difficult due to technological constraints for this volume of water. Although it is possible to treat the water to background levels in the laboratory, technological and cost limitations required to scale-up a laboratory treatment scheme to a full-scale treatment facility could prohibit treatment of inorganics to background. EPA will require treatment of extracted groundwater to those levels achievable using the best available demonstrated technologies and will require the potentially responsible parties to modify the treatment plant as necessary to achieve levels expressed in EPA's standards. EPA is confident that these levels will be protective of human health and the environment for treated water released from the site.

7. Comment:

The commentor asked for an explanation on why soil leachate concentrations are proposed as acceptable when they are far higher than the clean-up goals for groundwater.

7. Response:

EPA uses leachate tests to determine the ability of a contaminant to move from a solid waste and to establish whether the waste can be classified as hazardous. For the Baxter site, leachate tests will be used to establish the level at which a treatment process is effective and no further treatment is necessary. The leachate standards that EPA has proposed take into consideration groundwater protection factors. Under normal situations, the volume of leachate generated by water passing through a waste is significantly smaller than the volume of the aquifer or surface water that may be affected. Contaminants within the leachate as it moves through soil tend to leave the liquid and adsorb to soil particles. Therefore the concentration of the leachate can decrease as the leachate moves. Due to the relatively small volume of leachate produced compared to an aquifer or surface water body, EPA also assumes that people will not be directly consuming leachate or coming in contact with sufficient quantities of the leachate for it to be harmful. For these reasons the leachate standards can be higher than the drinking water or aquifer standards. It is also important to note that while waste treatment is occurring at the site, the soils will be contained in lined treatment cells. All leachate collected from within these lined cells will be directed in pipes either back onto the surface of the soil treatment area or into the water treatment plant. EPA does not intend to allow the leachate to reach or affect groundwater or surface water.

* * *

B. COMMENTS FROM STATE AGENCIES

Commentor: Anthony Landis (California Department of Health Services)
Date: June 19, 1990

1. Comment:

It is the position of the California Department of Health Services that the California Environmental Quality Act (CEQA) and the Safe Drinking Water & Toxic Enforcement Act (Proposition 65) are site ARARs.

1. Response:

The National Contingency Plan (NCP) presents the criteria that EPA uses in identification of Applicable or Relative and Appropriate Requirements (ARARs). The NCP (40 CFR 300.400(g)(4)) states, "Only those state standards that are promulgated, are identified by the state in a timely manner, and are more stringent than federal requirements may be applicable or relevant and appropriate. For purposes of identification and notification of promulgated state standards, the term 'promulgated' means that the standards are of general applicability and are legally enforceable." The NCP further states that EPA may select an alternative that does not meet a state identified ARAR if "the state has not consistently applied, or demonstrated the intention to consistently apply, the promulgated requirements in similar circumstances at other remedial actions within the state" (40 CFR 300.430(f)(C)).

EPA has determined that the requirements of CEQA are no more stringent than the requirements for environmental review under CERCLA, as amended by SARA. Pursuant to the provisions of CERCLA, the NCP and other federal requirements, EPA's prescribed procedures for evaluation of environmental impacts, selecting a remedial action with feasible mitigation measures, and providing for public review, are designed to ensure that the proposed action provides for the short-term and long-term protection of the environment and public health and hence perform the same function as, and are substantially parallel to, the State's requirements under CEQA.

Since EPA has found that CERCLA, the NCP, and other federal requirements are no less stringent than the requirements of CEQA, EPA has determined that CEQA is not an ARAR for this site.

EPA will continue to cooperate with DHS and other State and federal agencies during the design phase of the remedial action to clarify further environmental review and mitigation requirements and ensure that they are fulfilled.

EPA has performed a thorough evaluation of Proposition 65 or the Safe Drinking Water and Toxic Enforcement Act of 1986 (the Act) and the regulations implementing it (CCR Title 22 Section 12000 et. seq.) and has determined that the Act is not an ARAR for this site for the following reasons. To be an ARAR, Proposition 65 discharge limits would need to be more stringent than standards adopted by EPA in the Record of Decision. EPA's clean-up goals are based on a 1 in 1,000,000 (1×10^{-6}) risk level for carcinogens. However, in some instances analytical quantification limits are higher, such as in the case of arsenic, and EPA will be using a 1×10^{-5} risk level as the standard. Risk levels promulgated under CCR Title 22 Article 7 (No Significant Risk Levels), Section 12703, specify a 1 in 100,000 (1×10^{-5}) risk level, which is less stringent than EPA's standard.

CCR Title 22, Section 12701, paragraph (a) clearly allows EPA to use discharge standards other than those presented in the regulation. This paragraph states, "Nothing in this article shall preclude a person from using evidence, standards, risk assessment methodologies, principles, assumptions or levels not described in this article to establish that a level of exposure to a listed chemical poses no significant risk". EPA has performed a risk assessment meeting the requirements of CCR Title

22, Section 12721, and has determined that EPA's standards pose "No Significant Risk" as intended under this regulation.

EPA's identification of an alternative standard is also supported by Proposition 65 Title 22 regulations. Section 12703, paragraph (b) states,

> For chemicals assessed in accordance with this section, the risk level which represents no significant risk shall be one which is calculated to result in one excess case of cancer in an exposed population of 100,000, assuming lifetime exposure at the level in question, <u>except where sound considerations of public health support an alternative level, as for example, where a clean-up and resulting discharge is ordered and supervised by an appropriate governmental agency or court of competent jurisdiction</u> (emphasis added).

As the lead agency for the Baxter site, EPA clearly can select health-based standards using other standards and considerations that are protective of human health and the environment.

EPA has discussed Proposition 65 issues with California Health and Welfare Agency personnel (the Health and Welfare Agency is the administering Agency for Proposition 65) and has been informed that Proposition 65 was not intended to establish clean-up levels or discharge limitations for hazardous waste site remedial actions. They cited CCR Title 22, Article 4 (Discharge), Section 12401 (Discharge of Water Containing a Listed Chemical at Time of Receipt) in making this statement. Section 12401 (b) states:

> Whenever a person otherwise responsible for the discharge or release, receives water containing a listed chemical from a source other than a source listed in subdivision (a), [subdivision (a) specifies a drinking water supply in compliance with all primary drinking water standards, which is not the case for this site], the person does not "discharge" or "release" within the meaning of the Act to the extent that the person can show that the listed chemical was contained in the water received, and "discharge or release" shall apply only to that amount of the listed chemical derived from sources other than water, provided that:

(1) The water is returned to the same source of water supply, or
(2) The water meets all primary drinking water standards for the listed chemical or, where there is no primary drinking water standard, the water shall not contain a significant amount of the chemical.

Therefore treated water that is sprayed onto the log decks or directed to the percolation ponds, which both meets the standards presented in 12401(b)(2) and will ultimately be returned to the same source of water supply as stated in 12401(b)(1) does not constitute a discharge or release under Proposition 65.

In summary, it is EPA's goal to return the site aquifer to its greatest beneficial use and to reduce the residual risk at the site to background levels. All discharges from the site will be performed to standards identified in the Record of Decision that are protective of human health and the environment and will pose no significant risk. Because EPA goals and standards are consistent with Proposition 65 and because Proposition 65 is no more stringent that EPA's standards, Proposition 65 is not an ARAR for this site.

Finally, the communication requirements of Proposition 65 duplicate or are not more stringent than Federal standards and are not an ARAR for this site.

2. Comment:

DHS requests to be included in all discussion related to cleanup of Beaughton Creek.

2. Response:

EPA will include DHS in all significant discussions related to cleanup of Beaughton Creek.

3. Comment:

DHS recommends a "worst first" remedial program that will address current health threats as a priority. This should involve removal of contaminated soils and sediments, temporarily "capping" the site to prevent fugitive dust emissions, source detection and elimination, and plume redefinition based on the proposed clean-up levels.

3. Response:

EPA concurs with these recommendations. EPA is presently developing plans to control dust emissions and runoff from the wood treatment property. EPA is working with Baxter and International Paper personnel in defining immediate source control activities and the locations of additional site wells.

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Commentor: Susan Warner (California Regional Water Quality Control Board - North Coast Region)
Date: June 28, 1990

1. Comment:

The NCRWQCB does not concur with the FS assessment that Federal Ambient Water Quality Criteria (AWQC) are not ARARs for the site.

1. Response:

EPA has reviewed this issue and, based on ARAR selection criteria presented in the NCP, concurs that the Federal Ambient Water Quality Criteria could be used as ARARs for the site remedy, if the remedy involved discharge to surface water. However, EPA is not proposing discharge to surface water, therefore AWQC are not an ARAR for this site.

2. Comment:

The NCRWQCB does not concur with EPA's assessment that Proposition 65 is not an ARAR and provides information indicating that Proposition 65 is being enforced consistently throughout the North Coast region.

2. Response:

Based on a review of the information provided by NCRWQCB and criteria presented in the NCP for identification and use of ARARs, EPA's assessment of Proposition 65 remains that it is not an ARAR for this site. See also EPA's response to DHS comment

No. 1. Of the 11 documents provided to EPA as evidence of Proposition 65 enforcement, 9 of the documents predate Proposition 65 implementation and naturally cannot be used as evidence for Proposition 65 enforcement. Two of the documents relate to recent enforcement of waste discharge requirements at a Louisiana-Pacific wood treatment facility in Mendicino County. However, in the Louisiana-Pacific case (Order 85-88), the NCRWQCB is allowing discharge of treated effluent from a wood treatment operation to the waters of the State. This discharge consideration is inconsistent with other portions of the North Coast region, such as the Baxter site, where the NCRWQCB is prohibiting discharge of treated effluent. In the second Louisiana-Pacific case (Complaint No. 89-103), the only standard identified is 50 micrograms per liter, the MCL for arsenic, which is significantly higher than EPA's Baxter site standard of 1 microgram per liter (ppb). Neither the Baxter nor Roseburg enforcement orders provided can be considered as examples of Proposition 65 enforcement because they predate the Act. Contaminated runoff containing Proposition 65 chemicals can still be detected in surface water flowing from the Baxter property. The Roseburg water treatment system was not designed or constructed to address Federal or State water treatment facility requirements, and it is not treating for arsenic, a primary site contaminant and a Proposition 65 listed chemical. No evidence was provided to EPA in these documents that demonstrates that the discharge limitations of Proposition 65 are being enforced or even met at other locations within the State.

3. Comment:

The NCRWQCB does not concur with the clean-up goals for polynuclear aromatics and chlorophenolics in sediments.

3. Response:

EPA is amending the clean-up goals stated in the Proposed Plan for sediments. EPA is proposing to excavate and remove all sediments with detectable or above-background levels of wood treatment chemicals in all surface water drainages associated with the site, except Beaughton Creek. At the request of the California Department of Fish and Game, EPA is not proposing to excavate sediments within Beaughton Creek until after results from additional Creek surveys become available.

4. Comment:

The NCRWQCB does not agree with the elimination of the option of discharging to the Weed publicly-owned wastewater treatment works (POTW) and retaining the option for discharge to surface waters.

4. Response:

The disposal option for discharge of treated effluent to the local POTW was eliminated because at present the facility does not have the capacity to accept or treat the effluent. Should conditions at the POTW change that will allow acceptance of treated effluent, EPA will then consider the POTW as a disposal option. Discharge of treated effluent into Beaughton Creek was retained as a potential option to allow disposal (as opposed to shutting off the treatment system) during the winter months. EPA's primary disposal option, which is use of the water on the log sprinkler decks, is only feasible from mid-April through October when the sprinkler system is operational. EPA is now proposing the use of percolation/evaporation ponds and groundwater reinjection as the treated water disposal option for the winter months. Discharge to surface water will only be considered when all other disposal options prove infeasible.

5. Comment:

The NCRWQCB states that discharge to surface water will require amending the Basin Plan.

5. Response:

EPA recognizes that amending the Basin Plan would be necessary to allow surface water discharge to Beaughton Creek. EPA stated such in the FS Report. EPA will consider all other viable disposal options before requesting an amendment to the Plan.

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Commentor: Liese L. Schadt (California Regional Water Quality Control Board, North Cost Region)
Date: September 11, 1990

1. Comment:

The Regional Board repeats its position that Proposition 65 is an ARAR and comments on EPA's proposed arsenic and pentachlorophenol standards as being equal to Proposition 65 standards.

1. Response:

See response to comments by Anthony Landis (California Department of Health Services) and Sue Warner (Regional Board) on this issue. EPA's proposed arsenic standard of 5 ppb is based on EPA's risk assessment for this site. The proposed standard for pentachlorophenol is based on the California Applied Action Level for the contaminant. Based on guidance provided in CCR Title 22 Article 7 (No Significant Risk Levels), the Proposition 65 limits for arsenic and pentachlorophenol would be 5 and 20 ppb, respectively. These limits are equal to or greater than EPA's proposed standards, and therefore Proposition 65 is not considered an ARAR.

2. Comment

The Regional Board does not concur with EPA's clean-up standard for chromium of 570 ppm in soils. The Regional Board requests that the clean-up level reflect chromium's "high potential for leaching from soils" and be established at its background level for the site. The Regional Board requests that CCR Title 22 TTLC and STLC tests be performed on soil containing pentachlorophenol, stating that this compound is also leachable.

2. Response

As a result of a previous request of the Department of Health Services, EPA has revised the clean-up standard for chromium in soils to reflect its TTLC concentration of 500 ppm and for pentachlorophenol its TTLC level of 17 ppm. For all site contaminants that have a TTLC/STLC value (arsenic[1], chromium, copper, zinc, and pentachlorophenol), EPA will use the results of both tests in assessing the cleanup of contaminated soils. If

[1] For arsenic, EPA will use 8 ppm or background as the excavation standard, and the TTLC/STLC criteria as treatment standards.

any sample fails either test, the soil associated with the sample will be treated and handled appropriately.

EPA does not share the Regional Board's concerns over the leachability of chromium and pentachlorophenol at this site for the following reasons. Data collected during the remedial investigation, and by others, shows that samples with elevated chromium concentrations were always detected in the presence of elevated arsenic; samples with elevated pentachlorophenol concentrations were always detected with elevated creosote compound (carcinogenic PAH) concentrations. Through excavation and removal of arsenic to background and carcinogenic PAHs to less than 1 ppm, essentially all of the site chromium and pentachlorophenol will also be removed for treatment. Should elevated chromium and pentachlorophenol be detected at a site location without elevated arsenic or PAHs, EPA will use the TTLC/STLC criteria to assess the need for removal and treatment.

The TTLC criteria for chromium (2,500 ppm for chromium (III) and 500 for chromium (VI) do not support a major concern for leachability of chromium. The TTLC values are based on scientific data which reflect the leachability of the element coupled with groundwater protection considerations. If the DHS considered chromium highly leachable, then the TTLC criteria would be lower. Use of the TTLC criteria for excavation and treatment of soil is consistent with the definition of "no significant risk" as used in Title 22.

Data collected during the remedial investigation, and more recently provided by the potentially responsible parties, do not support a concern that chromium is highly leachable at this site. Data from the RI report show chromium in soils to range from 40.3 ppm (background) to 45,000 ppm, with an average chromium level of 130 ppm. Arsenic ranged from 8 ppm to 38,500, with an average site level of 240 ppm. Groundwater concentrations ranged from 8 ppb to 122 ppb (average 13 ppb) for chromium and 1 ppb to 1,740 ppb (average of 37 ppb) for arsenic. These data show that although the average chromium soil concentration is more than 50 percent of that of arsenic, the average groundwater concentration is 33 percent of that of arsenic. The maximum groundwater concentration of chromium is less than 10 percent of that of arsenic.

Recent groundwater data collected 6/22/90 through 7/18/90 as part of the groundwater pump and treat effort (see letter of August

27, James Grant to Jay Amin of IP) also do not reflect a high leachability for chromium at this site. These data show current chromium concentrations in groundwater to range from 1 ppb to 178 ppb (average of 37 ppb) and arsenic concentrations in groundwater to range from 12 ppb to 6,189 ppb (average of 945 ppb). These samples were collected from the most contaminated portion of the groundwater plume and are higher than the RI report values which include results from the less contaminated portion of the plume. However the results do support the conclusion that chromium is not a significant concern with regard to leachability. As stated above, through removal and treatment of soil with arsenic above background, chromium will also be removed and treated. Therefore, threats to groundwater due to chromium at this site will be alleviated.

3. Comment:

The Regional Board requests that the clean-up standards for pentachlorophenol and tetrachlorophenol in sediments be reduced to analytical detection limits.

3. Response:

EPA concurs and has reduced the clean-up standards for these contaminants to analytical detection limits (about 5 ppb).

4. Comment:

The Regional Board reiterates that discharges to surface water are prohibited under the Basin Plan.

4. Response:

The option of discharge of treated water to Beaughton Creek is no longer proposed at this time.

5. Comment:

The Regional Board emphasizes that a program for monitoring the leachate collection and removal system is needed to ensure compliance with standards presented in the ROD.

5. Response:

EPA concurs with the comment. The Consent Decree will contain language regarding the necessity of leachate collection and removal and the need to adhere to standards. Specifics on leachate collection and monitoring will be incorporated into remedial design and action documents.

6. Comment:

The Regional Board provided additional descriptions of enforcement actions for inclusion into the ROD.

6. Response:

The additional descriptions were incorporated as appropriate.

Commentor: P. Bontadelli (California Department of Fish and Game)
Date: July 2, 1990

1. Comment:

The discussion of specific clean-up goals should include health concerns for people and wildlife.

1. Response:

The clean-up goals assessed by EPA included considerations for human health and the environment. EPA will not allow discharges to surface water, surface impoundments, or to groundwater that exceed health-based standards or levels presented in the Record of Decision. EPA proposes to excavate contamination from drainage sediments to background levels to prevent any further movement of contaminants into Beaughton Creek. EPA does not propose to remove contaminated sediments from Beaughton Creek unless results of proposed Creek studies identify the need for such a removal.

2. Comment:

The Department of Fish and Game is concerned that the proposed biological treatment method for treating groundwater is subject to upsets and is difficult to monitor. The Department recommends "additional organic removal steps" to be included in the treatment process, particularly if discharge to the Creek is being considered.

2. Response:

EPA has evaluated several "additional organic removal" or polishing steps for the initially treated groundwater. EPA is considering the use of either activated carbon or UV/ozone destruction of residual organics as the probable polishing step. EPA agrees that the final polishing steps will provide added assurance of contaminant removal. However, EPA is not proposing direct creek discharge at this time and therefore any upsets at the treatment plant will not directly affect surface water quality. EPA recognizes the State requirements for surface water discharge and is considering other options for disposal of the treated water.

3. Comment:

The Department recommends disposal of treated groundwater to include industrial process use or indirect discharge through the use of percolation ponds.

3. Response:

At present, EPA is proposing to use the log-deck sprinkling system to dispose of treated water during the late spring through fall months of operation. EPA will use percolation ponds and direct reinjection for water disposal during the winter months.

4. Comment:

The Department believes that it is appropriate for the responsible parties to compensate the Department for the loss of trout fishery due to the past discharges of untreated groundwater.

4. Response:

EPA concurs.

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C. COMMENTS BY THE RESPONSIBLE PARTIES

Commentor: J. Morgan III (J.H. Baxter & Company)
Date: June 21, 1990

1. Comment:

Baxter notes that Ammoniacal Copper Arsenate (ACA) should be added in the Feasibility Study Report to the list of preservatives formerly used at the plant.

1. Response:

Comment noted.

2. Comment:

Baxter notes that one of the retorts is used for ACZA and D-Blaze treatment, and the other is used for creosote and ACZA treatment.

2. Response:

Comment noted.

3. Comment:

Baxter notes that the Baxter company was also involved in sponsoring the bioremediation pilot study, the pump and treat study, and the current monitoring program.

3. Response:

Comment noted.

4. Comment:

Baxter states that the direct discharge referred to on page 1-22 of the FS consisted of rainwater, not process water.

4. Response:

The direct discharge referred to on page 1-22 was a result of releases of wastewater from the wastewater vaults and the spray field, as noted by the NCRWQCB in their field notes from the early 1980 time period.

5. Comment:

Baxter notes that it also was involved in contracting Sweet Edwards & Associates to perform field work at the site.

5. Response:

Comment noted.

6. Comment:

Baxter questions the approach used by EPA that incorporates TCDD-equivalence factors for evaluating the risk due to dioxins at the site. Baxter offers the use of deed restrictions to preclude residential use of the site.

6. Response:

The dioxins present at the site are a complex mixture of dioxin-based molecules varying in the degree of chlorinization for each group of molecules. The toxicity of dioxins is related to the degree of chlorinization and the location of chlorine atoms on the dioxin molecules. All dioxins are considered highly toxic with the 2,3,7,8-TCDD form being the most toxic. EPA has developed toxicity factors for the other chlorinated dioxins based on the toxicity of TCDD. When the other dioxins are present at a site, these factors are used to evaluate the risk of the mixture of dioxins detected. The use of the TCDD equivalency risk determination is standard practice for all sites where dioxins are detected, regardless of whether TCDD is present in the mixture.

In evaluating risks per land use scenarios, the risk assessment method used by EPA does not allow reliance upon deed restrictions for controlling public access to a site. EPA will consider establishment of deed restrictions as a part of the final remedy.

7. Comment:

Baxter does not concur with the concept of treating soil biologically and then containing the residual soils in a controlled land disposal unit. Baxter believes that the lower weight molecules will be destroyed and that the risk due to the soils will be removed.

7. Response:

The biological treatment process will effectively destroy the "lighter weight" creosote compounds (i.e., non-carcinogenic PAHs), but these compounds are actually the less toxic of the components of creosote. The higher molecular weight PAHs, which are also the carcinogenic fraction of creosote, are more toxic and difficult to destroy biologically. Much more treatment time is required to treat these compounds biologically. The toxicity of the difficult-to-treat PAHs is the reason EPA is considering long-term management of the treated soil residuals in a controlled land unit.

8. Comment:

Baxter has serious reservations about moving plant structures to access the contaminated soils below the structures, and suggests using in-place treatment of soils beneath the structures.

8. Response:

EPA's assessment indicates that a temporary or permanent relocation of the wood treatment structures would be the most effective means of accessing soils beneath the structures, which are some of the most contaminated soils at the site. EPA is willing to determine a time schedule for relocation of structures that minimizes impacts upon wood treatment operations.

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Commentor: ChemRisk (ChemRisk was contracted by the responsible parties to perform an assessment of EPA's Endangerment Assessment. ChemRisk's comments are provided in a document entitled: "Technical Review of the USEPA Region IX Endangerment Assessment for the J.H. Baxter/IP/Roseburg Forest Products Superfund Site, Weed, California)

Date: June 29, 1990

Comment 1:

ChemRisk states difficulties in identifying data sets used in the EPA Endangerment Assessment and reports errors in calculations.

Response 1:

EPA's review of the data sets did not identify any problems that would result in a significant change in the conclusions drawn in EPA's Endangerment Assessment. ChemRisk's assessment did not significantly change EPA's primary health-based clean-up standards, nor the standards based on ARARs or other health-based criteria stated in the Proposed Plan.

Comment 2:

ChemRisk disagrees with the maximum exposure scenarios used in determining worst-case risks.

Response 2:

The scenarios used in this Endangerment Assessment were based on guidance for conducting endangerment assessments available at the time of development and are therefore consistent with EPA's endangerment assessment process.

Comment 3:

ChemRisk disagrees with the future-use condition scenarios used to assess risks at the Site.

Response 3:

The guidance quoted in ChemRisk's comment refers to very rural sites. The Baxter site does not fit this description. It is located in a small but populated community with residences currently located within 100 feet of the property. While there are alternate residential building sites in the vicinity, there is no reasonable assurance that the Baxter property would remain industrial and could not be converted to residential use prior to completing site remedy.

Comment 4:

ChemRisk disagrees with EPA's approach used to assess toxicity of PAHs and offers an alternative approach.

Response 4:

The alternative approach referenced by ChemRisk is still in the peer-review stage and has not yet been generally applied to Superfund risk assessments.

5. Comment:

ChemRisk states that the Endangerment Assessment did not incorporate the beneficial effects of current remediation projects into the Risk Assessment.

5. Response:

The endangerment assessment guidance requires a risk assessment of baseline conditions (i.e., conditions where no cleanup or institutional controls have occurred). Therefore current efforts were not included.

EPA does not agree that the current activities have reduced overall site risk. At the time of development of this ROD, only two activities at the site have been implemented to partially control movement of contamination at the site. These two actions are Roseburg's french drain water treatment unit and Baxter's partial surface water control efforts. Both actions are considered by EPA as temporary source control efforts that do not address the primary problems at the site. Data on the groundwater pumping study were not available to assess its effectiveness relative to risk reduction.

EPA recognizes that Roseburg's activated water treatment unit during the course of its operation has prevented the continuous and sometimes catastrophic releases of wood treatment chemicals that have occurred in the recent past. However, EPA does not consider either the french drain nor its associated treatment unit, in their current configurations, a part of the final remedy. The current system captures contaminated water beyond the primary source areas and EPA believes that capturing and treating contaminants at the source would be more effective for the site.

In addition, the Roseburg treatment system does not treat for metals. Although water containing arsenic is currently pumped into the log-deck sprinkler system, there remains a potential for it being discharged to the Creek. Under the current treatment scenario, should any of the pumps or the treatment unit fail, contaminated water would be discharged to the Creek. Moreover, if the french drain pumps are shut off or fail for a short-period of time, the groundwater table will rise, flooding the entire excavation area from the french drain to the cut bank. In the past when this has occurred, the ponded water eventually seeped and flowed to the west into the site discharge drainage which flows past Lincoln Park. Because these possibilities remain under the current operations at the site, EPA has elected not to consider the actions under the baseline or future use scenario.

The primary surface water risk posed by the site is a result of continued releases of water contaminated with metals in runoff from the wood treatment property. Although Baxter has installed partial surface water drainage control on a portion of the property, EPA considers these controls to be inadequate to be considered as a risk reduction action for the site. The controls consist of a 6-inch ditch and berm, controlling runoff on a portion of the property. The location and depth of the ditches is adequate to control brief precipitation episodes. The ditches and berms are inadequate to control the intense precipitation events common to the site area. Contaminated runoff is observed from the property during average precipitation events and for these reasons EPA has elected not to consider these partial controls under any of the risk assessment scenarios.

6. Comment:

The Endangerment Assessment has not incorporated the effects of natural biological processes on the breakdown of contaminants.

6. Response:

Incorporation of natural biological processes is not included under EPA's endangerment assessment methodology.

7. Comment:

ChemRisk disagrees with the fugitive dust modeling performed for the Endangerment Assessment.

7. Response:

EPA's endangerment assessment methodology allows the use of the most toxic form of a chemical (e.g., chromium VI instead of chromium III) when data are not available to adequately determine the form of the chemical in the environment. The modeling performed by ChemRisk, although showing different results, supports the conclusions of EPA's assessment that contaminated dust poses unacceptable risks to the adjacent community. Therefore, a discussion on the differences between the two methods is not warranted.

8. Comment:

ChemRisk states that upper-bound estimates of geometric mean concentrations should have been used instead of maximum concentrations.

8. Response:

Current EPA guidance recommends that a 95% upper confidence limit on arithmetic mean concentrations be used to estimate reasonable maximum exposures. ChemRisk calculated geometric mean concentrations which can frequently produce much lower values than arithmetic mean concentrations. EPA's guidance allows for use of geometric mean values only when the strength of site-specific data indicates that the data are best described by a log-normal distribution.

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Commentor: D. Kerschner (Beazer Environmental Services)
Date: July 2, 1990

1. Comment:

EPA has not provided justification for selection of background for the clean-up goals. Beazer also contends that EPA's selection of clean-up levels is not consistent with the National Contingency Plan (NCP). EPA should use ARARs in selection of clean-up levels.

1. Response:

Cleanup of the site is primarily being driven by arsenic, a known human carcinogen, and the carcinogenic PAH fraction of creosote. For arsenic, the background soil concentration of 8 ppm and groundwater concentration of 5 ppb (analytical quantification limit) represent the 1×10^{-5} risk level. Clean-up goals for carcinogenic PAHs set at 0.51 ppm for soils and 0.025 ppb for groundwater represent the 1×10^{-6} risk level. However, for carcinogenic PAHs the practical analytical quantification limit is 5 ppb which is the groundwater standard. Selection of clean-up standards within this risk range is consistent with the NCP range of 1×10^{-4} to 1×10^{-6} for carcinogens. In addition, arsenic and carcinogenic PAHs are commingled with all other site contaminants. Removal and treatment of arsenic and carcinogenic PAHs to the NCP risk range is expected to remove and treat the remaining contaminants to essentially background levels. If soil sampling indicates other contaminants present without elevated arsenic or carcinogenic PAHs, the other contaminants will be excavated and treated to health-based standards as outlined in the Record of Decision.

EPA has selected background as the clean-up standard for sediments because the NCRWQCB's Basin Plan, which is an ARAR, does not allow the release of detectable levels of wood treatment chemicals into the waters of the State. Meeting the requirements of this ARAR can only be assured through removal of contaminants to background or non-detect levels.

2. Comment:

Risk-based clean-up goals established for the site should be based on the current industrial-use scenario.

2. Response:

The Superfund Endangerment Assessment process requires EPA to consider current land use and future land use when performing the risk assessment. Consideration of the site as a future residential area is consistent with EPA policy, particularly given the close proximity of current residences to the site.

3. Comment:

The Proposed Plan should recognize the potential technical impractability of achieving the groundwater goals. The commentor references the NCP (55 FR 46:8734) relative to groundwater remedy uncertainties.

3. Response:

At present there are no data available that would indicate that the groundwater goals are not achievable. The initial pump and treatment studies have produced a reduction in contaminant concentrations indicating the potential effectiveness of this remedy. Excavation, fixation and containment of contaminated surface soils is expected to greatly facilitate achievement of groundwater goals for inorganics. Excavation or other source control measures for the creosote contamination could also improve the ability to meet the PAH goals. Natural attenuation cannot be considered for the site because according to NCP guidance (55 FR 46:8734), natural attenuation is "recommended only when active restoration is not practicable, cost effective or warranted because of site specific conditions (e.g., Class III groundwater or groundwater which is unlikely to be used in the foreseeable future)". The NCP also requires EPA to consider current and potential groundwater usage in this assessment. Because initial data show groundwater pumping capable of removing contaminants, that the aquifer is Class I and currently used for a water supply, the site does not fit the conditions necessary for consideration for natural attenuation to address the contamination.

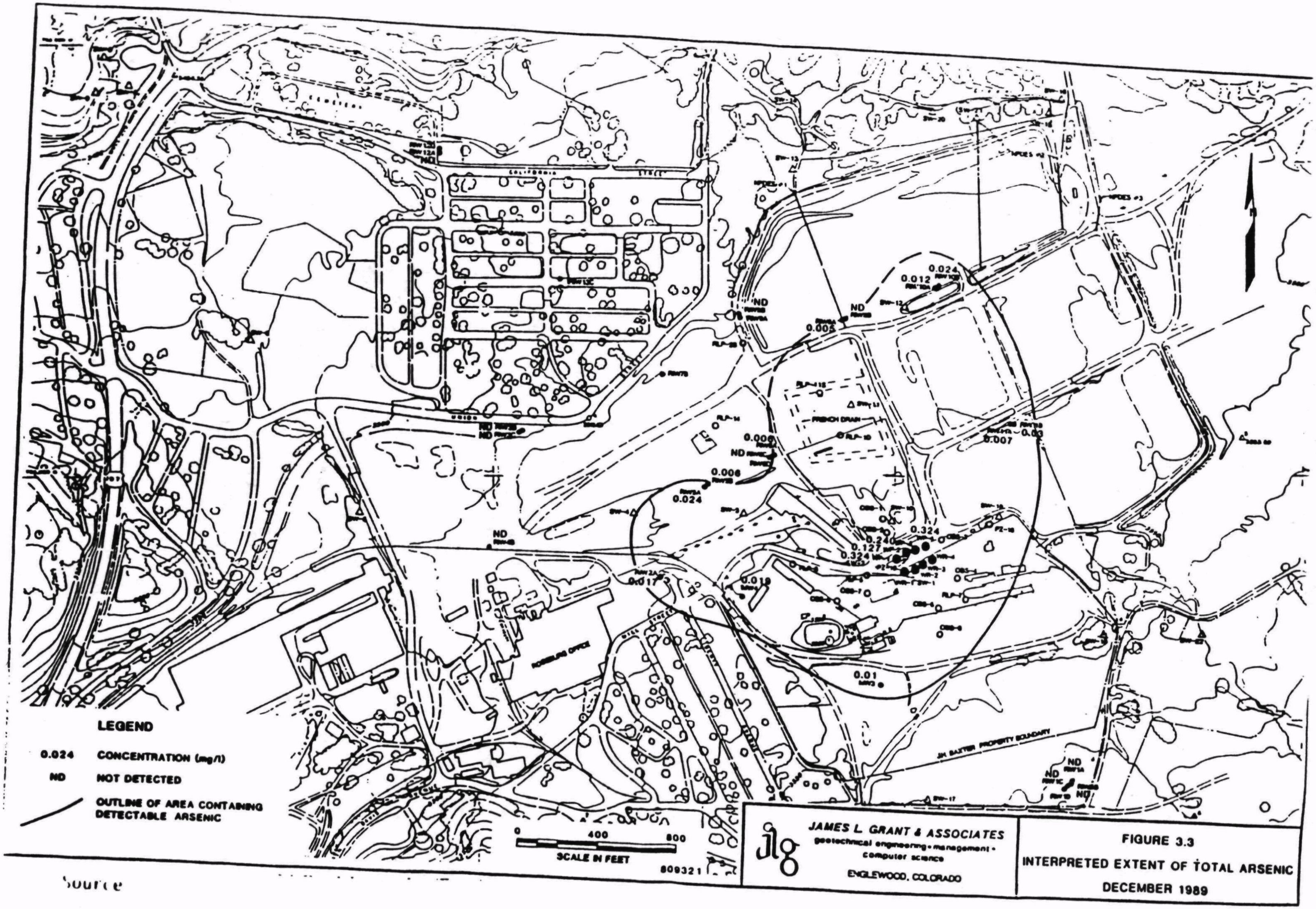
Discussion of technical impractability is premature at this time. EPA will review the effectiveness of the selected remedies when EPA performs its 5-year review. The NCP section referenced requires EPA to seek additional actions that will enhance recovery of contaminants, if such actions appear to be warranted (e.g., soil flushing), or plume control through additional pumping. EPA will implement such measures as necessary to allow achievement of the goals. The NCP section referenced by the commentor discusses uncertainty relative to achievement of goals and the necessity for contingencies in groundwater remedies. The NCP sections referenced do not present a framework for "technical impracticability" determinations for inclusion in the Record of Decision, however.

4. Comment:

The proposed remedy for surface soils contaminated with arsenic in areas of the site without corresponding groundwater contamination is not cost effective or consistent with the NCP. The removal remedy is not warranted and the soils only should be capped.

4. Response:

The Remedial Investigation groundwater data referred to by the commentor are now more than 3 years old. Groundwater samples from new wells installed adjacent to the southeastern edge of the wood treatment property indicate that the arsenic plume extends further to the east than is shown on the Remedial Investigation figures. The direction of groundwater flow to the new wells is from the eastern portion of the wood treatment property, which is contaminated with arsenic. These contaminated soils are the only identified source of the observed groundwater arsenic contamination. With regard to the spray field soils, the only monitoring well at the spray field is located at the downgradient edge of the field. This well is contaminated and thus the source of contamination must be the upgradient contaminated soils. A revised arsenic plume map is provided which illustrates the current extent of the plume. Based on the extent of groundwater contamination, EPA has concluded that all contaminated soil is contributing to the groundwater problem. The groundwater table is very near ground surface throughout the wood treatment property. Therefore, capping would not be protective of



Source

...arterly Report
...arterly Monitoring Report
... Quarter, 1989

J.H. Baxter/Roseburg/International Paper Facility
...i, California

Prepared for
J.H. Baxter & Company
Weed, California

groundwater, making excavation and treatment the remedy most consistent with NCP requirements.

5. Comment:

EPA has underestimated the cost of the excavation-fixation-redisposal remedy by not including some additional factors that may be necessary. The FS states that RCRA closure requirements will be included in the implementation of this remedy.

5. Response:

The FS states that the <u>substantive</u> requirements of RCRA will be met for this alternative, not the <u>specific</u> requirements. The proposed remedy includes the substantive requirements of RCRA throughout such as site monitoring, decontamination, closure plans, closure notifications, post-closure monitoring, etc. as integral parts of the overall remedy. EPA is not required to duplicate or perform the RCRA requirements separately for this remedy. At the time of development of the FS, the necessity for a liner had not been determined. The treated waste may not be a RCRA waste. EPA included a contingency cost for a liner in the overall remedy cost estimate for the situation should a liner become necessary. If the treated waste meets RCRA treatment standards, a liner may not be necessary for the long-term storage of the treated soils.

6. Comment:

The proposed bioremediation remedies appear infeasible.

6. Response:

Pilot studies performed by IP and Mississippi State University on bioremediation of soil and groundwater have produced results indicating that the remedies will be feasible.

7. Comment:

Remedial Investigation Report: Near surface soil samples (i.e., samples of the 1 to 5 foot interval) should not have been collected with a hand auger due to the problem of surface soil falling into the sample hole and contaminating the near surface sample.

7. Response:

To collect near surface samples EPA first augered down to the top of the sample interval using a 4-inch hand auger. The actual sample was collected with a separate 3-inch auger with sufficient care to prevent material from above from affecting the sample.

8. Comment:

RI Report: The use of chloride as a surrogate for zinc chloride is inappropriate.

8. Response:

In the interpretation of zinc data, EPA did not use the chloride data as a surrogate.

9. Comment:

RI Report: EPA did not provide a basis for the assumption that 5 times the background mean reflects contamination attributed to the site.

9. Response:

This assumption is based on EPA guidance for background assessment. This guidance reflects the variability in chemical analyses and background levels.

10. Comment:

RI Report: Beazer disagrees that methylene chloride and bis-2-ethylhexyl phthalate are contaminants for the site.

10. Response:

Neither of these chemicals are chemicals of concern for the site.

11. Comment:

RI Report: Beazer states that PAHs in groundwater samples should not be used as an indication of a creosote body.

11. Response:

EPA used a combination of visual evidence and chemical data to map the creosote body.

12. Comment:

RI Report: Beazer states that it is not appropriate to discuss health risks in the RI report.

12. Response:

The discussion of health risks in the RI report is according to EPA guidance and appropriate for understanding the nature of site contamination.

13. Comment:

Endangerment Assessment: Beazer makes several comments on the scope of the Endangerment Assessment.

13. Response:

Substantive comments were addressed in the response to comments made by ChemRisk The Endangerment Assessment was developed based on guidance available at the time of its development. New guidance will not substantially affect the conclusions of the Endangerment Assessment and revision of the document is not warranted.

14. Comment:

Beazer states that collection and treatment of surface water runoff in the interim period until soils cleanup is complete is unreasonable, unsupported and technically cumbersome.

14. Response:

Baxter presently has a 500,000 gallon tank for storage of contaminated runoff. This storage will be augmented by an additional 500,000 gallon tank. This storage capacity coupled with a treatment capacity of 100 gallons per minute in the adjacent water treatment plant is more than adequate capacity for typical rain events at the site. Surface water berms and ditches to control the typical runoff are also easily implemented at the site, preventing runoff contaminated with arsenic exceeding MCL concentrations from leaving the site. EPA recognizes that the interim measures are inadequate to contain a catastrophic rain fall event, but the benefits of the interim measures provide significant protection of surface waters prior to implementation of surface soil cleanup.

15. Comment:

Beazer notes a discrepancy for the action levels for benzene between the Proposed Plan and FS.

15. Response:

The 10 ppb level for benzene is the 1×10^{-6} risk level as determined by the Endangerment Assessment for this site. The 1 ppb level for benzene reflects the California MCL, an ARAR. California MCLs are established at the 1×10^{-6} level as determined through the State's risk analysis process. It is important to note that benzene was detected in groundwater in a well adjacent to a former underground storage tank. Benzene is not a widespread contaminant at this site.

16. Comment:

There is no reference to the development of remedial goals for leachate produced from treated soils.

16. Response:

Leachate values are based on regulatory levels and guidance presented in 40 CFR 268 and in California Title 22 waste determination regulations.

17. Comment:

EPA uses the terms "goals", "requirements, and "standards" when referring to remedial clean-up levels for the site.

17. Response:

EPA will use the term "standards" when referring to clean-up levels in all future documents related to this site.

* * *

APPENDIX B

ADMINISTRATIVE RECORD INDEX

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170	05/19/70	J. H. Baxter & Co.		Work Order Request RE: Pollution Control, (J. H. Baxter & Co. Form)	5
186	01/23/73	N. Morgan, CA DOFG		Form: Request for Chemical Analysis and/or Bioassay Findings on Materials Submitted (CA DOFG)	-
171	01/31/73	O. Fick, IPC	W. Rodriguez, CRWQCB	Ltr: Report on the Pond Cleaning Operation at the IPC, Weed, Plant	2
177	02/05/73	J. Day, CA DOFG	Inspector N. Dollahite, CA DOFG	Memo: IPC - Pollution of Beaughton Creek, Siskiyou County	8
178	02/06/73	CA DOFG	J. Day, CA DOFG	Memo: IPC's Activities In and Adjacent to Beaughton Creek, Siskiyou County A Preliminary Field Report on Apparent Stream Damage	4
184	02/09/73	R. Hansen, CA DOFG	Regional Manager, CA DOFG	Memo: Additional Chemical Analyses from Beaughton Creek, Siskiyou County	12
179	02/26/73	R. O'Brien, CRWQCB-NCR	D. Joseph, CRWQCB-NCR	Ltr: Tentative Requirements - IPC-Long Bell Mill, Weed, Siskiyou County	1
180	03/14/73	R. Nilsson, CA DOFG	N. Dollahite, CA DOFG	Memo: Monitoring of IPC, Long Bell Division, Weed	1
181	03/19/73	D. Ahrenholz, CA DOFG	J. Day, CA DOFG	Memo: Addendum to Report of IPC's Activities on Beaughton Creek, Siskiyou County, dated Feb. 6, 1973	1
182	03/20/73	Redding Record Searchlight		Newsclipping: International Paper Co. Accused of Polluting Water	1
183	03/31/73	Redding Record Searchlight		Newsclipping: No Contest Pleas Entered in Creek Case Paper Firm's Reply to Pollution Charges Scheduled Tuesday	1

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185	09/18/73	R. Leachman, CA DOFG	Environmental Services, CA DOFG	Memo: Beaughton Creek Investigation, Siskiyou County	[illegible]
169	07/06/79	C. Rich, CA SSWMB	Files	Memo: Inspection of the Weed Disposal Site in Siskiyou Co. (47-AA-019)	[illegible]
172	01/10/80	D. Williams, J. H. Baxter & Co.		Form: Supervisors Accident Investigation Report, J. H. Baxter & Co.	[illegible]
168	06/08/81	J. Flynn, IPC	EPA Region IX	Ltr: Transmittal of EPA Notification of Hazardous Waste Site Forms	3
194	06/08/81	L. Hope, J. H. Baxter & Co.	EPA Region IX	Ltr: Transmittal of EPA Form 8900-1 and a map in compliance with Sec. 103(c) of CERCLA	10
187	04/05/83	S. Warner, CRWQCB-NCR	C. Johnson, CRWQCB-NCR, File	Memo: Inspection of J. H. Baxter, Mar. 1, 1983	4
227	05/01/83			Sampling/Analysis Data at Various Sites in Weed, CA	4
226	05/06/83	J. Nakao, CA DOHS		Rpt: Laboratory Report - Metals, Lincoln Park Area	[illegible]
225	06/09/83	S. Warner, CRWQCB-NCR	T. Baker, Dept of Health, County of Siskiyou	Ltr: Transmittal of Preliminary Results from Laboratory Analyses from Samples Taken in Lincoln Park and other Areas in Weed	3
221	11/04/83	J. H. Baxter & Co.		Maps: Sampling Points at the J. H. Baxter Site	2
224	11/28/83	J. Nakao, CA DOHS	C. McLaughlin, CA DOHS	Memo: Transmittal of Corrected Results for "Total" Metals for HML #8600, 8601, & 8602	[illegible]
223	12/02/83	J. Nakao, CA DOHS	C. McLaughlin, CA DOHS	Ltr: Transmittal of Corrected Results for Total Metals for HML 8594, J. H. Baxter, Weed, CA	[illegible]

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222	01/26/84	J. Morgan III, J. H. Baxter & Co.	D. Miller, Attorney at Law	Ltr: Transmittal of Analyses of Matched Samples at J. H. Baxter, Weed, CA	3
220	03/13/84	B. Parsons, CA DOHS	D. Williams, J. H. Baxter & Co.	Ltr: Transmittal of Sample Results from 1-4 Nov., 1983 Inspection	25
173	04/01/84	Woodward-Clyde Consultants		Rpt: Preliminary Investigation of J. H. Baxter Weed Plant	3
190	04/01/84	CA DOHS		Evaluation of Organic Chemical Contaminants in the Groundwater Supply for the City of Weed, CA (Mar/Apr 84)	10
192	04/13/84	B. Parsons, CA DOHS	A. Shah, CA DOHS	Memo: Transmittal of Final Mitre Model Study for J. H. Baxter & Co.	5
219	05/04/84	G. Anderson, ANATEC	S. Warner, CWQCB-NCR	Rpt: Transmittal of Results - Water Sampling, J. H. Baxter	8
188	06/25/84	D. Small, CA DOHS		Form: Site Inspection Data Sheet Facility Inspection of J. H. Baxter & Co.	4
216	07/25/84	B. Quan, CA DOHS	R. Sato, Office of the Attorney General	Memo: Laboratory Results and Sampling/Analysis Data, J. H. Baxter	22
215	08/14/84	CA DOHS		Form: Sample for Chemical Analysis	8
213	09/14/84	R. Bayuk, MD, Dept of Public Health, County of Siskiyou	R. Zwanziger, Dept of Public Health, County of Siskiyou	Memo: Well Sampling - Water Analysis - J. H. Baxter	5
174	09/24/84	T. Baily, Woodward-Clyde Consultants	J. Morgan, J. H. Baxter & Co.	Ltr: Groundwater Table Level on the Baxter Property Installation of French Drains	1

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211	10/26/84	J. Morgan, J. H. Baxter & Co.	D. Joseph, CWQCB-NCR	Ltr: Transmittal of Analytical Results from Wells in Weed Area	5
189	10/30/84	S. Warner, CRWQCB-NCR	C. Johnson, CRWQCB-NCR, File	Rpt: Compliance Inspection Report J. H. Baxter & Co.	5
210	11/28/84	B. Parsons, CA DOHS	T. Baker, Dept of Public Health, County of Siskiyou	Ltr: Sample Results from Weed High School Well on J. H. Baxter Property	14
201	03/01/85	M. Blomme, Roseburg FPC		Rpt: Monitoring Report by Roseburg Lumber Company	4
200	03/20/85	J. H. Baxter & Co.		Samples Collected at the J. H. Baxter & Co. Site Soluble Metal Analytical Results	
202	05/21/85	F. Reichmuth, CRWQCB-NCR	C. Johnson, R. Klamt, CRWQCB-NCR, File	Ltr: Comparison of Replicate Samples from the J. H. Baxter Site, Weed, CA	3
208	06/13/85	A. Wellman, CRWQCB-NCR	F. Reichmuth, C. Johnson, CRWQCB-NCR, File	Ltr: Analysis of Self-monitoring Data from Roseburg Lumber Co. 7/84-4/85	4
209	06/21/85	J. Hawley, CH2M HILL	J. Chaney, North Coast Labs	Rpt: Sample Analysis of Water, for North Coast Labs	1
10	07/06/85	J. Killingsworth, J. V. Killingsworth & Assoc.		Testimony of Frank Salzler	[illegible]
217	07/15/85	R. McJunkin, CA DOHS		Rpt: Laboratory Report for Total Metal Analysis at J. H. Baxter	[illegible]
103	09/12/85	H. Seraydarian, EPA Region IX	J. H. Baxter	Ltr: Failure to comply with (HSWA) requirements, Re: J. H. Baxter & Co., Weed Treating Plant	

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176	11/14/85	R. Gray, CA DOFG		Rpt: Incident Report RE: Alter, Change and Divert a Stream Without Notification to DOFG	7
205	12/01/85	J. H. Baxter & Co.		Sampling/Analysis Data, French Drains, Pizzometers & Wells, J. H. Baxter & Co.	25
214	12/10/85			Charts of Sampling Analysis, J. H. Baxter & Co.	3
193	12/13/85	C. Flippo, EPA Region IX	Files	Form: CERCLA 103(c) Notification Form on J. H. Baxter Plant, Weed, CA	7
1	12/16/85	H. Seraydarian, EPA Region IX	A. Baxter, J. H. Baxter	Ltr: Notification of potentially responsible party status, request for information (see response ltr of 6 Feb 86)	5
2	12/16/85	H. Seraydarian, EPA Region IX	P. O'Neil, IP Co.	Ltr: Notification of potentially responsible party status, request for information	5
3	12/16/85	H. Seraydarian, EPA Region IX	J. Stephens, Roseburg Forest Products	Ltr: Notification of potentially responsible party status, request for information.	5
165	12/20/85	C. Flippo, EPA Region IX	Files	Site Visit to the J. H. Baxter Wood Treating Plant, Weed, CA	3
158	01/21/86	S. Warner, CRWQCB-NCR	F. Reichmuth, CRWQCB-NCR, S. Agarwal, SWRCB, File	Ltr: RCRA CME Inspection of the JHB Plant, Weed, Siskiyou County	3[illegible]
199	02/05/86	M. Blomme, Roseburg FPC	CWQCB	Ltr: Transmittal of Monitoring Report by Roseburg FPC	[illegible]
133	02/12/86	Sweet, Edwards and Assoc., Inc.	Roseburg Forest Products	Rpt: Weed Facility Status Report	[illegible]
166	03/10/86	C. Von Bargen, M. Jonas, CDM	C. Flippo, L. Nash, EPA Region IX	Memo: Review of the J. H. Baxter Weed Facility Status Report, Sweet, Edwards & Assoc., Feb. 86	[illegible]

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207	05/13/86	J. Hawley, CH2M HILL	D. Williams, J. H. Baxter & Co.	Rpt: Water Sampling Data, J. H. Baxter & Co.	11
160	06/04/86	S. Warner, CRWQCB-NCR	J. Adams, SWRCB	Memo: Comprehensive Monitoring Evaluation Report for J. H. Baxter Facility	66
228	06/04/86	L. Woods, CA DOHS	L. Nash, EPA Region IX	ROC: Air Quality Monitoring at J. H. Baxter Site	1
204	06/13/86	D. Williams, J. H. Baxter & Co.	F. Reichmuth, CWQCB-NCR	Memo: Water Sampling Program 82-142 (1/1/86-6/13/86)	27
4	07/01/86	J. Wactor, EPA Region IX	M. Fjordbeck, SLCBAY	Ltr: Notification that EPA will conduct the RI/FS, meeting advisory for discussion of comments on RI/FS workplan.	2
5	07/21/86	J. Morgan III, J. H. Baxter	J. Wactor, EPA Region IX	Ltr: Description of proposed fencing, fencing specs attached	
167	07/24/86	T. Erler, K/J/C	L. Nash, EPA Region IX	Plan: Sampling and Analysis Plan for Selected Beneficial Use Wells in Vicinity of BIPR Site, Weed, CA (K/J/C 6090)	6
159	08/14/86	C. Lichens, E & E, Inc.	L. Nash, EPA Region IX	Memo: Preliminary Angel Valley Sampling, Field Oversight	3
6	08/28/86	H. Seraydarian, and J. Wactor, EPA Region IX	J. Morgan III, J. H. Baxter	Administrative Order on consent under CERCLA	8
7	09/03/86	J. Wactor, EPA Region IX	S. Goldberg, Steptoe & Johnson, and J. Gould, SLCBAY	Ltr: Transmittal of J. H. Baxter and Roseburg Forest Products fence Consent Order	1
8	09/08/86	J. Gould, SLCBAY	J. Wactor, EPA Region IX	Ltr: Comments on fencing order, signature of concurrence on changes	2
175	09/15/86	T. Erler, R. Casias, K/J/C	L. Nash, EPA Region IX	Rpt: Monthly Progress Report Regarding Activities Performed in Vicinity of BIPR Site, Weed, CA	26

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203	10/17/86	M. Blomme, Roseburg FPC	CWQCB	Rpt: Monitoring Reports by Roseburg FPC	27
218	10/28/86	B. Flock, J. H. Baxter & Co.	T. Shepard	Notes: Baxter Permit 18771 218 Request for Statement to "Site Specific Soil Problems"	4
206	01/09/87	D. Williams, J. H. Baxter & Co.	F. Reichmuth, CWQCB-NCR	Memo: Water Sampling Program 82-142 (5/2/86-1/9/87)	36
134	01/13/87	S. Warner, CRWQCB	L. Nash, EPA Region IX	Ltr: Commencement of field work at Weed site, time frame for the RI/FS and site mitigation	1
135	01/23/87	J. Wondolleck, CDM	EPA Region IX	Plan: Work Plan for RI/FS at B/IP/R site, Weed, CA, Vol. 1 (technical)	275
124	02/01/87	EPA Region IX	Residents, Weed, CA	Fact Sheet on Release of Work Plan Outline to the public	6
136	02/19/87	J. Grove IV, EPA Region IX	F. Reichmuth, CRWQCB	Ltr: Transmittal of Final Version of RI/FS Work Plan for B/IP/R site	2
137	02/19/87	J. Zelikson, EPA Region IX	T. Landis, CA DOHS	Ltr: Transmittal of Final Version of RI/FS Work Plan for B/IP/R site	2
138	02/19/87	EPA Region IX	C. Goggin, State Clearinghouse	Ltr: Notification of a Proposed Superfund Project	2
143	02/23/87	Office of Governor, State Clearinghouse	L. Nash, EPA Region IX	Acknowledgement, State of California, Project Notification and Review System, Office of the Governor	[illegible]
139	03/04/87	K. Black, CDM	EPA Region IX	Plan: Sampling and Analysis Plan for RI/FS B/IP/R site, Weed, CA (final)	[illegible]

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141	03/06/87	CA ARB	L. Nash, EPA Region IX	Ltr: Recommendations on the Proposed Superfund Project: J. H. Baxter	1
142	03/06/87	N. Botts, CDM	EPA Region IX	Plan: Quality Assurance Project Plan for RI/FS B/IP/R site, Weed, CA	50
198	03/12/87	M. Blomme, Roseburg FPC	CWQCB	Rpt: Monitoring Reports with Bioassay's by RFPC	7
101	03/26/87	J. Easton, CRWQCB	All Regional Board Executive Officers, CA WQCB	Memo: Procedures to comply with the "cease discharge" requirement in the Toxic Pits Cleanup Act (TPCA)	6
144	03/26/87	J. Parnell, CA DOFG	G. Van Vleck, Resources Agency	Memo: Contamination in Beaughton Creek and the affected Aquatic Resources by the J. H. Baxter Site	1
145	04/01/87	CDM	EPA Region IX	Rpt: B/IP/R Field Report for the Groundwater and Surface Water Sampling and Analysis Program - April 87	30
146	04/01/87	M. Richards, CDM	L. Nash and H. Burke, EPA Region IX	Plan: Community Relations Plan B/IP/R site, Weed, CA - April 87	30
147	04/20/87	H. Carlyle, Jr., Office of Planning and Research	L. Nash, EPA Region IX	Transmittal Sheet - Attached comments as the State Process Recommendation	1
111	04/30/87	J. Morgan III, J. H. Baxter	H. Burke, EPA Region IX	Ltr: Comments on the Community Relations Plan for the J. H. Baxter/IP/Roseburg Site in Weed, CA	3
149	05/08/87	K. Black, CDM	EPA Region IX	Plan: Surface Soils Sampling and Analysis Plan for RI/FS B/IP/R site, Weed, CA	150

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148	05/19/87	CDM	EPA Region IX	Rpt: Field Report for May 87 Surface Soil Sampling at the B/IP/R site, Weed, CA	14
110	05/22/87	L. Nash, EPA Region IX	H. Burke, EPA Region IX	Memo: Response to comments submitted by J. Morgan, J. H. Baxter & Co., on the B/IP/R Community Relations Plan	2
151	05/22/87	S. Warner, CRWQCB	L. Nash, EPA Region IX	Ltr: Review of Sample Description for bore hole drilling from QAPP	2
152	06/09/87	CDM	EPA Region IX	June 87 Surface Water/Sediment Sampling and Analysis Plan for RI/FS B/IP/R site Weed, CA	85
153	06/12/87	L. Levenson, EPA Region IX	S. Warner, CRWQCB	ROC: Summary of Treatability Study, meeting	1
154	06/15/87	R. Olsen and J. Hopkins, CDM	J. Wondolleck, EPA Region IX	Memo: B/IP/R site Treatability Studies for Surface and Groundwaters	6
128	06/18/87	CDM	EPA Region IX	Field Report for June 1987 Surface Water/Stream Sediment Sampling at the Baxter/IP/Roseburg Site, Weed, CA	13
163	06/18/87	R. Crooks, CA DOHS	EPA Region IX	Rpt: Inspection Report RCRA Major/Generator Inspection	26
164	06/18/87	R. Crooks, CA DOHS		Rpt: Hazardous Waste Management Report Interview of Darrell Williams	2
162	06/22/87	R. Crooks, CA DOHS		Rpt: Hazardous Waste Surveillance and Enforcement Report J. H. Baxter & Co.	6

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104	07/02/87	L. Hogg, CA DOHS	L. Levenson, EPA Region IX	Ltr: Transmittal of 1985 Part A from J. H. Baxter & Co.	5
94	07/06/87	J. Zelikson, EPA Region IX	L. Hope, J. H. Baxter	Ltr: Request for "Information Regarding Potential Releases from Solid Waste Management Units"	2
156	07/09/87	K. Black, CDM	EPA Region IX	Rpt: Final July 87 Subsurface Sampling/Monitoring Well Installation. Sampling Analysis Plan for RI/FS	250
161	07/28/87	R. Crooks, CA DOHS		Activity: Compliance Evaluation Inspection (CEI) J. H. Baxter & Co.	
123	08/07/87	J. Grove IV, EPA Region IX	F. Reichmuth, CRWQCB	Ltr: Implementation of the Toxic Pits Control Act (TPCA) and Proposition 65 at the J. H. Baxter Site	2
197	08/19/87	J. Hawley, CH2M HILL	M. Blomme, Roseburg FPC	Rpt: Water Monitoring Reports by CH2M Hill on Roseburg FPC	23
100	08/31/87	G. McGinnis, Land Treatment Group, Miss. Forest Products Utilization Laboratory	J. Amin, IP Co.	A Laboratory and Field Demonstration Study for IP Co. Under cover letter Doc. #99 dated 09/04/87	16
105	09/03/87	J. Morgan III, J. H. Baxter & Co.	J. Zelikson, EPA Region IX	Ltr: Refusal to Submit Solid Waste Management Unit Information	[illegible]
99	09/04/87	A. Molnar, Kennedy/Jenks/Chilton	L. Levenson, EPA Region IX	Cover Letter for Document #100 dated 08/31/87	[illegible]

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195	09/10/87	D. Williams, J. H. Baxter & Co.	B. Williams, J. H. Baxter & Co.	Memo: Water Sampling Program 82-142, J. H. Baxter & Co.	50
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41	11/13/87	K. Kitchingman, EPA Region IX	J. Grove, EPA Region IX	MEMO - Review of Analytical Data re: Dioxin & Furans	19
42	11/18/87	EPA Region IX		National Priorities List - J. H. Baxter Co.	16
43	12/03/87	K. Kitchingman, EPA Region IX	J. Grove, EPA Region IX	MEMO - Review of Analytical Data re: Inorganics (RAS Metals)	8
44	12/11/87	K. Kitchingman, EPA Region IX	J. Grove, EPA Region IX	MEMO - Review of Analytical Data re: Metals (5/19-5/21)	10
45	12/11/87	K. Kitchingman, EPA Region IX	J. Grove, EPA Region IX	MEMO - Review of Analytical Data re: Metals (5/20)	6
46	01/11/88	D. Oswald, CH2M Hill		RPT - Quality Assurance Report re: J. H. Baxter Site	38
47	01/18/88	D. Oswald, CH2M Hill		RPT - Quality Assurance Report re: J. H. Baxter Site	64
48	01/26/88	K. Kitchingman, EPA Region IX	B. Curnow, EPA Region IX	MEMO - Review of Analytical Data re: Organics	24
49	01/26/88	K. Kitchingman, EPA Region IX	L. Levenson, EPA Region IX	MEMO - Review of Analytical Data re: Organics	48

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50	01/28/88	K. Kitchingman, EPA Region IX	B. Curnow, EPA Region IX	MEMO - Review of Analytical Data re: Metals	27
51	01/28/88	K. Kitchingman, EPA Region IX	B. Curnow, EPA Region IX	MEMO - Review of Analytical Data re: Metals	20
52	01/28/88	K. Kitchingman, EPA Region IX	B. Curnow, EPA Region IX	MEMO - Review of Analytical Data re: Metals (8/4/87-9/8/87)	37
53	02/18/88	K. Kitchingman, EPA Region IX	B. Curnow, EPA Region IX	MEMO - Review of Analytical Data re: Dioxins & Furans	22
54	03/17/88	S. Simpson, EPA Region IX	D. Bingham, EPA Region IX	MEMO - Request for Data Review re: TOC Dioxins	19
55	04/08/88	K. Kitchingman, EPA Region IX	B. Curnow, EPA Region IX	MEMO - Review of Analytical Data re: Total Metals	11
56	04/12/88	K. Kitchingman, EPA Region IX	B. Curnow, EPA Region IX	MEMO - Review of Analytical Data re: COD, TOC, Oil and Grease	5
57	04/21/88	G. Nicoll, ICF		RPT - Quality Assurance Report - RAS, Metals and Chloride re: J. H. Baxter Site	14
58	05/06/88	D. Oswald, CH2M Hill		RPT - Quality Assurance Report re: J. H. Baxter Site	24
59	05/19/88	A. Naylor, DOFG	B. Kor, CRWQCB-NCR	LTR - DOFG concurs with proposed Order 88-74	13

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60	05/20/88	L. Woods, DHS	L. Levenson, EPA Region IX	LTR - Report on the industrial hygiene survey conducted at the Baxter Wood Treatment Facility, Weed, CA on Nov. 19-20, 1985	[illegible]
61	05/20/88	L. Woods, DHS	L. Levenson, EPA Region IX	LTR - Report on the industrial hygiene survey conducted at the Baxter Facility, Nov. 19-20, 1985	2
62	05/25/88	K. Kitchingman, EPA Region IX	B. Curnow, EPA Region IX	MEMO - Review of Analytical Data re: Dioxins	15
63	05/25/88	B. Kor, CRWQCB-NCR	Roseburg Forest Products	Order No. 88-74 Requiring Roseburg Forest Products to Cease and Desist from discharging wastes contrary to order No. 86-46 and the Toxic Pits Cleanup Act	3
64	06/01/88	CDM	U.S. EPA	RPT - Preliminary Draft RI Report for Baxter Site, Weed, CA	600
65	06/08/88	S. Heare, EPA Region IX		MEMO - Eligibility of J. H. Baxter Site for listing on the NPL	7
66	06/09/88	J. Morgan, J. H. Baxter Co.	L. Levenson, EPA Region IX	LTR - Additional Information Concerning Responsible Parties and Contamination History at Weed Site	1
67	06/20/88	J. Clifford, EPA Region IX	J. Georges, I.P.	LTR - EPA is continuing to propose the J. H. Baxter Site, Weed, CA to the Superfund National Priority List	2

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68	06/20/88	J. Clifford, EPA Region IX	W. Martinell, J. H. Baxter Co.	LTR - EPA is continuing to propose the J. H. Baxter Site, Weed, CA to the Superfund National Priorities List	2
69	06/20/88	J. Clifford, EPA Region IX	J. Stephens, Roseburg Forest Products	LTR - EPA is continuing to propose the J. H. Baxter Site, Weed, CA to the Superfund National Priorities List	2
70	06/22/88	J. H. Baxter Co.	CRWQCB-NCR	RPT - Toxic Pits Cleanup Act Hydrogeologic Assessment Report for the J. H. Baxter Weed Treatment Facility, Weed, CA	700
71	06/23/88	D. Evans, CRWQCB-NCR	M. Blomme, Roseburg Forest Products	LTR - re: abandoning three monitoring wells located on Roseburg's property in Weed, CA	5
72	06/23/88	D. Evans, CRWQCB-NCR	D. Williams, J. H. Baxter Co.	LTR - re: abandoning two monitoring wells located on J. H. Baxter's property in Weed, CA	5
73	06/24/88	K. Kitchingman, EPA Region IX	B. Curnow, EPA Region IX	MEMO - Review of Analytical Data re: Metals	9
74	06/30/88	K/J/C, Inc.		Bioremediation Demonstration Study, Weed, CA, J. H. Baxter Superfund Site	125
75	06/30/88	P. Fahrenthold, Fahrenthold & Assoc., Inc.	L. Levenson, EPA Region IX	LTR - Review of RI Report re: Baxter Site	17

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76	07/06/88	J. Morgan, J. H. Baxter Co.	L. Levenson, EPA Region IX	LTR - J. H. Baxter Comments on Draft RI Report for Weed, CA Site	12
77	07/07/88	B. Kor, CRWQCB-NCR	A. Strauss, EPA Region IX	LTR - Comments on EPA's Preliminary Draft RI Report re: Baxter Site	8
78	07/07/88	P. Marshall, DHS	L. Levenson, EPA Region IX	LTR - Comments on Draft RI Report re: Baxter Site	2
79	07/08/88	D. Critchfield, I.P.	L. Levenson, EPA Region IX	LTR - Comments on Draft RI Report	10
80	07/27/88	L. Levenson, EPA Region IX	Members of the JHB/IP/R Interagency/PRP Group	LTR - Summary of Interagency/PRP Meeting, 7/27/88, Further EPA Activities	4
81	08/02/88	J. Morgan, J. H. Baxter Co.	L. Levernson, EPA Region IX	LTR - Transmittal of copies of invoices from Entrix concerning soil sampling	4
82	08/09/88	D. Evans, CRWQCB-NCR	J. Morgan, J. H. Baxter Co.	LTR - Response to correspondence re: control of contaminated stormwater runoff	4
83	09/08/88	B. Kor, CRWQCB-NCR	J. Stephens, Roseburg Forest Products	LTR - Comments re: EPA's Preliminary Draft RI for the Weed, CA, wood products complex	2
84	09/08/88	B. Kor, CRWQCB-NCR	J. Morgan, J. H. Baxter	LTR - Comments re: EPA's Preliminary Draft RI for the Weed, CA, wood products complex	2

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85	09/08/88	B. Kor, CRWQCB-NCR	D. Critchfield, I.P.	LTR - Comments re: EPA's Preliminary Draft RI for the Weed, CA, wood products complex	2
86	09/09/88	K. Black, CDM		PLAN - Final September 1988 Groundwater, Soils and Sediment, Sampling and Analysis Plan for RI/FS	150
87	09/19/88	J. Morgan, J.H.Baxter	D. Evans, NCWQCB	LTR - re: J.H.B. Compliance with Cease and Desist Order No. 88-87 and Long Term Capital Improvements for Weed, CA, Plant	17
88	09/30/88	L. Levenson, EPA Region IX	D. Evans, CRWQCB-NCR	LTR - Potential I.P. Pilot Study Proposal re: JHB/IP/Roseburg Site, Weed, CA	2
89	09/30/88	L. Levenson, EPA Region IX	D. Evans, CRWQCB-NCR	LTR - Runoff Collection Proposal re: JHB/IP/Roseburg Site, Weed, CA	2

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AR NUMBER	DATE (yy/mm/dd)	FROM/ORGANIZATION	TO/ORGANIZATION	DESCRIPTION/SUBJECT
AR 1	no date	Bioremediation Group Mississippi Forest Products Laboratory		Bioremediation Demonstration Study, Phase II- Field Site Studies
AR 2	88/07/08	James L Grant & Associates, Inc	International Paper Company	Comments on draft Remedial Investigation report by CDM, w/TL to Leo Levenson
AR 3	88/09/00	Camp, Dresser & McKee, Incorporated		Field Report for September, 1988 Groundwater, Soils & Sediment Sampling, WA #167-9L47.7, Contract #68-01-6939
AR 4	88/09/22	Lawrence & Associates		Chain of Custody Record
AR 5	88/10/10	Curtis & Tompkins, Ltd.		Report on 14 soil samples
AR 6	88/10/12	Lawrence & Associates		Illustration of tank site
AR 7	88/10/19	Thomas Baily Woodward-Clyde Consultants	Joe Morgan J H Baxter & Company	Ltr: Summary of review of laboratory results of soil samples collected at tank site & comments
AR 8	88/10/20	Joe Morgan J H Baxter & Company	David Evans CA Regional Water Quality Control Board - North Coast Region	Ltr: Response to CRWQCB-NC ltr of 10/7/88
AR 9	88/10/21	Richard Becker, Jeffrey Wong CA Department of Health Service	David Evans CA Regional Water Quality Control Board - North Coast Region	Ltr: Response to request of 9/22/88 re: assistance in assessing human health significance of dioxins in liver tissue of fish from Beaughton Creek
AR 10	88/11/00	Environmental Protection Agency		Superfund Program Proposed Plan: Libby Groundwater Site, Lincoln County, Montana, w/TL to Leo Levenson 12/13/88
AR 11	88/11/00	Camp, Dresser & McKee, Incorporated		Field Report for November, 1988 Groundwater Sampling, WA #167-9L47, Contract #68-01-6939

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AR 12	88/11/04	Leo Levenson Environmental Protection Agency, Region IX	David Evans CA Regional Water Quality Control Board - North Coast Region	Ltr: Comments on Joe Morgan's ltr of 10/28/88 re: soil sampling results for proposed tank pad & dry kiln areas
AR 13	88/11/07	John Wondolleck Camp, Dresser & McKee, Incorporated	Tom Huetteman Environmental Protection Agency, Region IX	Memo: Analytical request, groundwater verification sampling
AR 14	88/11/10	John Wondolleck Camp, Dresser & McKee, Incorporated	Leo Levenson Environmental Protection Agency, Region IX	Memo: September 1988 Groundwater, Sediments & Background Soil Sampling Results, w/data
AR 15	88/11/18	ICF Technology Incorporated		Analytical results, Table 1A, unvalidated data for Water Samples for SAS phenols & PAHs, w/memo to Betsy Curnow & Leo Levenson 11/21/88
AR 16	88/11/21	ICF Technology Incorporated		Quality Assurance Report, w/memo to Betsy Curnow 11/28/88
AR 17	88/11/21	ICF Technology Incorporated		Analytical results, Table 1A, unvalidated data for Water for RAS metalks, w/memo to Betsy Curnow & Leo Levenson 11/22/88
AR 18	88/11/21	ICF Technology Incorporated		Analytical results Table 1A, unvalidated data for soils for RAS Metals, w/memo to Betsy Curnow & Leo Levenson 11/22/88
AR 19	88/11/22	James L Grant & Associates, Inc	J H Baxter & Co, Int'l Paper Co, Roseburg Forest Prod.	Groundwater Remediation Program
AR 20	88/12/01	CA Regional Water Quality Control Board - North Coast Region	J H Baxter & Company	CRWQCB-NC Order #88-151: To cease & desist from discharging wastes contrary to Order #83-29 & the Toxic Pits Cleanup Act, w/TL to Joe Morgan 12/12/88

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AR 21	88/12/01	ICF Technology Incorporated		Quality Assurance Report, w/memo to Betsy Curnow 12/6/88
AR 22	88/12/01	CA Regional Water Quality Control Board - North Coast Region	Roseburg Forest Products	CRWQCB-NC Order #88-152, w/TL to Mike Blomme 12/12/88 (pages 2 & 4 are missing)
AR 23	88/12/01	CA Regional Water Quality Control Board - North Coast Region	International Paper Company	CRWQCB-NC Cleanup & abatement Order #88-155, w/TL to David Critchfield 12/12/88
AR 24	88/12/01	Betsy Curnow Environmental Protection Agency, Region IX	Benjamin Kor CA Regional Water Quality Control Board - North Coast Region	Ltr: Comment on Preliminary CRWQCB-NC Cease & Desist Orders #88-151, 88-152 & Preliminary Clean-up & Abatement Order #88-155
AR 25	88/12/08	Joe Morgan J H Baxter & Company	David Evans CA Regional Water Quality Control Board - North Coast Region	TL: Results of soil sampling for J H Baxter's proposed new tank farm
AR 26	88/12/09	David Evans CA Regional Water Quality Control Board - North Coast Region	Joe Morgan J H Baxter Wood Preserving	Ltr: Summary of responses to ltr of 9/1/88 & discussion of 11/17
AR 27	88/12/12	ICF Technology Incorporated		Quality Assurance Report, w/memo to Betsy Curnow 12/13/88
AR 28	88/12/12	Bert Bledsoe, John Matthews Robert S. Kerr Environmental Protection Research Laboratory	The Record	Memo: Trip Report
AR 29	88/12/20	John Matthews, Bert Bledsoe Robert S. Kerr Environmental Protection Research Laboratory	Leo Levenson Environmental Protection Agency, Region IX	Memo: Review of Interim Report "Bioremediation Demonstration Study"
AR 30	89/01/10	ICF Technology Incorporated		Quality Assurance Report, w/memo to Betsy Curnow, 1/11/89

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AR 31	89/01/11	ICF Technology Incorporated		Quality Assurance Report, w/memo to Betsy Curnow, 1/13/89
AR 32	89/01/17	David Evans CA Regional Water Quality Control Board - North Coast Region	David Critchfield International Paper Company	Ltr: Request for submittal of report of waste discharge for groundwater remediation program & list of requirements
AR 33	89/01/21	John Wondolleck Camp, Dresser & McKee, Incorporated	Carolyn Thompson Environmental Protection Agency, Region IX	Memo: Review comments on IPC's proposed Groundwater Remediation Demonstration Project (Grant proposal dated 11/22/88)
AR 34	89/01/31	James L Grant & Associates, Inc	J H Baxter & Co, Int'l Paper Co, Roseburg Forest Prod.	Work Plan for Test Pits to Investigate the Roseburg French Drain
AR 35	89/01/31	Mary Bishop, James Grant James L Grant & Associates, Inc	Jay Amin International Paper Company	Ltr: Progress report of activities on Weed Pilot Corrective Action Program during January 1989
AR 36	89/02/00			Static Water Level Measurements, w/Memo to Carolyn Thompson 3/2/89
AR 37	89/02/03	Patricia Port United States Department of the Interior	Bruce Blanchard United States Department of the Interior	Memo: Preliminary Natural Resources Survey, w/o attachments
AR 38	89/02/19	(illegible)	Carolyn Thompson Environmental Protection Agency, Region IX	ROC: Bioremediation of soils
AR 39	89/02/23	John Matthews, Bert Bledsoe Robert S. Kerr Environmental Protection Research Laboratory	Carolyn Thompson Environmental Protection Agency, Region IX	Memo: Review & Planning Meeting at Robert S Kerl Environmental Research Laboratory on 2/13/89, w/list of attendees
AR 40	89/02/28	James L Grant & Associates, Inc		Groundwater Remediation Demonstration Project, w/TL to Donald Critchfield

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AR 41	89/02/28	Mary Bishop, James Grant James L Grant & Associates, Inc	Jay Amin International Paper Company	Ltr: Progress report on activities on the Weed Pilot Corrrective Action Program during February 1989
AR 42				Document number AR 42 is not used.
AR 43	89/03/01	John Wondolleck Camp, Dresser & McKee, Incorporated	Carolyn Thompson Environmental Protection Agency, Region IX	Memo: Summary of conversation & meeting w/Harry Rectenwald re: restoration of Beaughton Creek
AR 44	89/03/07	ICF Technology Incorporated		Quality Assurance Report, w/memo to Betsy Curnow, 3/10/89
AR 45	89/03/07	John Wondolleck Camp, Dresser & McKee, Incorporated	Carolyn Thompson Environmental Protection Agency, Region IX	Memo: Comments & concerns on "Work Plan for Test Pits to Investigate the Roseburg French Drain"
AR 46	89/03/08	Ken Black	John Wondolleck Camp, Dresser & McKee, Incorporated	Memo: Comments on Groundwater Remediation Project by James L Grant
AR 47	89/03/08	John Wondolleck Camp, Dresser & McKee, Incorporated	Carolyn Thompson Environmental Protection Agency, Region IX	Memo: Comments & concerns on Groundwater Demonstration Project by James L Grant
AR 48	89/03/10	Miss Forest Prod Util Lab Mississippi State University	J H Baxter Company International Paper Company	Final Report (Laboratory Phase) Bioremediation Demonstration Study
AR 49	89/03/29	Camp, Dresser & McKee, Incorporated		Figure 1 - Map of Test Pit locations, w/TL to David Evans 3/30/89
AR 50	89/03/31	Carolyn Thompson Environmental Protection Agency, Region IX		EPA comments on James L Grant Groundwater Demonstration Project, w/TL to David Critchfield
AR 51	89/03/31	Mary Bishop, James Grant James L Grant & Associates, Inc	David Critchfield International Paper Company	TL: Final report for Groundwater Remediation Project

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AR 52	89/04/06			Agenda Meeting regarding Groundwater Remediation Demonstration Project
AR 53	89/04/11	Randall Ross Robert S. Kerr Environmental Protection Research Laboratory	Bert Bledsoe, John Matthews Robert S. Kerr Environmental Protection Research Laboratory	Memo: Review comments of the "Groundwater Remediation Demonstration Project", w/memo to Carolyn Thompson 4/25/89, w/o attachments
AR 54	89/05/10	Ed Cargile CA Department of Health Service	Donn Diebert CA Department of Health Service	Memo: Evaluation of J H Baxter Treated Wood Facility, Weed Groundwater Remediation Demonstration Project
AR 55	89/05/16	Mary Bishop, James Grant James L Grant & Associates, Inc	Jay Amin International Paper Company	Ltr: Progress report on activities at the Weed Pilot Corrective Action Program during April 1989, w/ltr to Gary McGinnis 3/30/89 & TL to David Evans
AR 56	89/05/24	CA Regional Water Quality Control Board - North Coast Region	J H Baxter & Co, Int'l Paper Co, Roseburg Forest Prod.	CRWQCB-NC Order #89-75 Waste Discharge Requirements & Monitoring Program #89-75, w/attachments & TL to Joe Morgan 6/8/89
AR 57	89/06/19	James L Grant & Associates, Inc		Figure 1: Proposed Building Location of pilot groundwater treatment system, w/TL to Carolyn Thompson
AR 58	89/06/30	Mary Bishop, James Grant James L Grant & Associates, Inc	Jay Amin International Paper Company	Ltr: Progress report of activities on the Weed Pilot Corrective Action Program during June 1989
AR 59	89/07/05	David Evans CA Regional Water Quality Control Board - North Coast Region	Joe Morgan et al J H Baxter & Co, Int'l Paper Co, Roseburg Forest Prod.	Ltr: Response to James L Grant ltr of 6/19/89 re: proposed location for Groundwater Bio-Remediation Project Treatment Plant

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AR 60	89/07/11	James L Grant & Associates, Inc		Groundwater Remediation Demonstration Program Report
AR 61	89/08/02	David Evans CA Regional Water Quality Control Board - North Coast Region	Ed Cargile CA Department of Health Service	Ltr: Response to CADOHS' comments of 5/15/89 re IPC's proposed pump & treatment program
AR 62	89/08/03	Mary Bishop, James Grant James L Grant & Associates, Inc	Jay Amin International Paper Company	Ltr: Progress report on activities on the Weed Pilot Corrective Action Program during July 1989
AR 63	89/08/14	John Wondolleck Camp, Dresser & McKee, Incorporated	Carolyn Thompson Environmental Protection Agency, Region IX	Memo: Field Trip Report observations of Subsurface Borings & Monitor Well Installation, w/TL to David Evans 8/23/89
AR 64	89/08/15	David Evans CA Regional Water Quality Control Board - North Coast Region	David Critchfield International Paper Company	Ltr: Comment on memo from Gary McGinnis to Jay Amin, 8/14/89 re: results of chemical analyses for soil samples (document is dated Aug. 15, 1899)
AR 65	89/08/21	James Strandberg Woodward-Clyde Consultants	Benjamin Kor CA Regional Water Quality Control Board - North Coast Region	Ltr: Important issues discussed in meeting re: Runoff control
AR 66	89/08/29	Woodward-Clyde Consultants	J H Baxter & Company	Final report: Interim Remediation to Control Rainfall Runoff, w/TL to Benjamin Kor 10/17/89 & 9/21/89
AR 67	89/08/29	Woodward-Clyde Consultants	J H Baxter & Company	Interim Remediation to Control Rainfall Runoff
AR 68	89/09/01	David Evans CA Regional Water Quality Control Board - North Coast Region	David Critchfield International Paper Company	Ltr: Comments on Progress Report by James L Grant dated 8/3/89 re: Groundwater Remediation Pilot Demonstration Project

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AR 69	89/09/02	ICF Technology Incorporated		Quality Assurance Report, w/memo to Betsy Curnow, 2/2/89
AR 70	89/09/11	Mary Bishop, James Grant James L Grant & Associates, Inc	Jay Amin International Paper Company	Ltr: Progress report of activities on the Weed Pilot Corrective Action Program during August 1989
AR 71	89/09/18	David Evans CA Regional Water Quality Control Board - North Coast Region	Joe Morgan J H Baxter & Company	Ltr: Comments on Report of Waste Discharge
AR 72	89/09/25	Donn Diebert CA Department of Health Service	Joe Morgan J H Baxter & Company	Ltr: Concerns re: portions of the proposal, w/memo to Donn Diebert
AR 73	89/10/03	David Evans CA Regional Water Quality Control Board - North Coast Region	Mike Blomme Roseburg Forest Products	Ltr: Comments on Report of Waste Discharge
AR 74	89/11/10	Mary Bishop, James Grant James L Grant & Associates, Inc	Jay Amin International Paper Company	Ltr: Progress report on activities on the Weed Pilot Corrective Action Program during October 1989
AR 75	89/11/20	W Don Maughan California Water Resources Control Board	Kenneth Sylva Weintraub, Genshlea, Hardy, Erich & Brown	Ltr: Decision not to review J H Baxter & Co's petition
AR 76	90/01/10	Mary Bishop, James Grant James L Grant & Associates, Inc	Jay Amin International Paper Company	Ltr: Progress report on activities on the Weed Pilot Corrective Action Program during December 1989
AR 77	90/02/08	John Wondolleck Camp, Dresser & McKee, Incorporated	Mary Masters Environmental Protection Agency, Region IX	Memo: Comments on "Agency Review Draft, Endangerment Assessment" by Clement Associates 12/22/89
AR 78	90/02/14	Mary Bishop, James Grant James L Grant & Associates, Inc	Jay Amin International Paper Company	Ltr: Progress report on activities on the Weed Pilot Corrective Action Program during January 1990

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AR 79	90/03/22	Kent Kitchingman Environmental Protection Agency, Region IX	Mary Masters Environmental Protection Agency, Region IX	Memo: Superfund Site Draft Feasibility Study for Internal Review
AR 80	90/03/26	James L Grant & Associates, Inc	J H Baxter & Company	Quarterly Report, Quarterly Monitoring Report, Fourth Quarter, 1989, w/TL to Darrell Williams
AR 81	90/03/26	John Matthews Robert S. Kerr Environmental Protection Research Laboratory	Mary Masters Environmental Protection Agency, Region IX	Memo: Comments on preliminary draft feasibility study
AR 82	90/03/27	James L Grant & Associates, Inc	J H Baxter & Company	Well Installation Report, Groundwater Remediation Demonstration Program, W/TL to David Critchfield
AR 83	90/04/03	Liese Schadt CA Regional Water Quality Control Board - North Coast Region	Mary Masters Environmental Protection Agency, Region IX	Ltr: Comments on Preliminary Draft Feasibility Study for Baxter/IP/Roseburg site, 3/3/90
AR 84	90/04/03	Liese Schadt CA Regional Water Quality Control Board - North Coast Region	Mary Masters Environmental Protection Agency, Region IX	Ltr: Initial comments on Preliminary Draft Feasibility Study of 3/3/90
AR 85	90/04/12	James L Grant & Associates, Inc	J H Baxter & Co, Int'l Paper Co, Roseburg Forest Prod.	Start-up Operation Manual for Pilot Groundwater Treatment System

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SUPPLEMENT NO. 3

This Index lists the documents contained in Supplement No. 3 to the Administrative Record for the J.H. Baxter & Company Superfund Site in Weed, California. The documents are listed in chronological order which is consistent with the arrangement of the documents in the bound volumes of the Administrative Record Supplement itself.

The documents contained in the Administrative Record have been considered by the U.S. Environmental Protection Agency in identifying remedial activities appropriate for use at the J.H. Baxter & Company Superfund Site.

GUIDANCE DOCUMENTS

The following is a list of U.S. EPA Guidance Documents consulted during development and selection of the Response Action for the J H Baxter & Company Superfund Site at Weed, CA. These documents are included in the Compendium of CERCLA Response Selection Guidance Documents (Volumes 1 - 35), which is available for public review at the Superfund Records Center, EPA Region 9, San Francisco.

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COMPENDIUM OF CERCLA RESPONSE SELECTION GUIDANCE DOCUMENTS

Doc No	Vol	Title	Date	Authors	Status	Pages	Tier	Attachments	OSWER/EPA Number
** RI/FS - GENERAL									
2002	3	GUIDANCE FOR CONDUCTING REMEDIAL INVESTIGATIONS AND FEASIBILITY STUDIES UNDER CERCLA	10/01/88	- OSWER/OERR	Final	390	1		OSWER #9355.3-01
2005	4	POLICY ON FLOOD PLAINS AND WETLAND ASSESSMENTS FOR CERCLA ACTIONS	08/01/85	- HEDEMAN, JR., W.N./OERR	Final	9	2		OSWER #9280.0-02
2010	4	SUPERFUND FEDERAL-LEAD REMEDIAL PROJECT MANAGEMENT HANDBOOK	12/01/86	- OERR	Draft	179	1		OSWER #9355.1-1
** RI/FS - RI DATA QUALITY/SITE & WASTE ASSESSMENT									
2100	5	A COMPENDIUM OF SUPERFUND FIELD OPERATIONS METHODS	12/01/87	- OERR	Final	550	1		OSWER #9355.0-14
2101	5	6 DATA QUALITY OBJECTIVES FOR REMEDIAL RESPONSE ACTIVITIES: DEVELOPMENT PROCESS	03/01/87	- CDM FEDERAL PROGRAMS CORP.	Final	150	1		OSWER #9355.0-7B
2102	6	DATA QUALITY OBJECTIVES FOR REMEDIAL RESPONSE ACTIVITIES: EXAMPLE SCENARIO: RI/FS ACTIVITIES AT A SITE W/CONTAMINATED SOILS AND GROUNDWATER	03/01/87	- CDM FEDERAL PROGRAMS CORP.	Final	120	1		OSWER #9355.07B

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2106	6	FIELD STANDARD OPERATING PROCEDURES MANUAL #4-SITE ENTRY	01/01/85	- OERR/HRSD	Final	29	2		OSWER #9285.2-01
2107	7	FIELD STANDARD OPERATING PROCEDURES MANUAL #6-WORK ZONES	04/01/85	- OERR/HRSD	Final	19	2		OSWER #9285.2-04
2108	7	FIELD STANDARD OPERATING PROCEDURES MANUAL #8-AIR SURVEILLANCE	01/01/85	- OERR/HSCD	Final	24	2		OSWER #9285.2-03
2109	7	FIELD STANDARD OPERATING PROCEDURES MANUAL #9-SITE SAFETY PLAN	04/01/85	- OERR/HRSD	Final	26	2	1) SAMPLE SITE SAFETY PLAN AND OSHA SAFETY PLAN 2) EMERGENCY OPERATION CODES REAL TIME MONITOR 3) RESPONSE SAFETY CHECK-OFF SHEET	OSWER #9285.2-05
2112	8	GUIDELINES AND SPECIFICATIONS FOR PREPARING QUALITY ASSURANCE PROGRAM DOCUMENTATION	06/01/87	- ORD/QUALITY ASSURANCE MANAGEMENT STAFF	Final	31	2	1) MEMO: GUIDANCE ON PREPARING QAPPs DATED 6/10/87	
2113	8	LABORATORY DATA VALIDATION FUNCTIONAL GUIDELINES FOR EVALUATING INORGANICS ANALYSES	07/01/88	- EPA DATA REVIEW WORK GROUP - BLEYLER, R.VIAR AND CO./SAMPLE MGMT. OFFICE	Draft	20	2		

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2114	8	LABORATORY DATA VALIDATION FUNCTIONAL GUIDELINES FOR EVALUATING ORGANIC ANALYSES	02/01/88	- BLEYLER, R./VIAR AND OC./SAMPLE MGMT. OFFICE - EPA DATA REVIEW ORKGROUP	Draft	45	2		
2115	8	PRACTICAL GUIDE FOR GROUND-WATER SAMPLING	09/01/85	- BARCELONIA, M.J., ET. AL./ILLINOIS ST. WATER SURVEY	Final	175	1		EPA/600/2-85/104
2116	8	PRACTICAL GUIDE FOR GROUND-WATER SAMPLING	07/01/85	- BARCELONA, M.J., ET. AL./ILLINOIS ST. WATER SURVEY					
2117	8	SOIL SAMPLING QUALITY ASSURANCE USER'S GUIDE	05/01/84	- BARTH D.S. & MASON, B. J./U. OF NEVADA, LAS VEGAS	Final				
2118	9+	TEST METHODS FOR EVALUATING SOLID WASTE, LABORATORY MANUAL PHYSICAL/CHEMICAL METHODS, THIRD EDITION (VOLUMES 1A, 1B, 1C, AND 11)	11/01/86	- OSWER	Final	3000	1		
2119	11	USER'S GUIDE TO THE CONTRACT LABORATORY PROGRAM	12/01/88	- OERR/CLP SAMPLE MANAGEMENT OFFICE	Final				

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** RI/FS - OTHER TECHNOLOGIES									
2300	16	A COMPENDIUM OF TECHNOLOGIES USED IN THE TREATMENT OF HAZARDOUS WASTES	09/01/87	- ORD/CERI	Final	49	2		EPA/625/8-87/014
2303	17	EPA GUIDE FOR IDENTIFYING CLEANUP ALTERNATIVES AT HAZARDOUS WASTE SITES AND SPILLS: BIOLOGICAL TREATMENT	/ /	- PACIFIC NORTHWEST LABORATORY	Final	120	2		EPA-600/3-83-063
2308	18	HANDBOOK FOR STABILIZATION/SOLIDIFICATION OF HAZARDOUS WASTE	06/01/86	- CULLINANE JR., M.J. ET.AL. /U.S. COE/WES	Final	125	1		EPA/540/2-86-001
2319	22	TECHNOLOGY SCREENING GUIDE FOR TREATMENT OF CERCLA SOILS AND SLUDGES	09/01/88	- OSWER/OERR	Final	130	1		EPA/540/2-88/004
** ARARS									
3001	25	CERCLA COMPLIANCE AND OTHER ENVIRONMENTAL STATUTES	10/02/05	- PORTER, J.W./OSWER	Final	19	1	1) POTENTIALLY APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS	OSWER #9234.0-2
3002	25	CERCLA COMPLIANCE WITH OTHER LAWS MANUAL	08/08/88	- OERR	Draft	245	2		OSWER #9234.1-01

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** WATER QUALITY									
4003	26	QUALITY CRITERIA FOR WATER 1986	05/01/87	- OFFICE OF WATER REGULATIONS AND STANDARDS	Final	325	2		EPA/440/5-86-001
1005	1	INFORMATION ON DRINKING WATER ACTION LEVELS [SECONDARY REFERENCE]	04/19/88	- FIELDS, JR., T./OSWER/ERD	Final	17	2	1) MEMO: RELEASE FROM LAWFULLY APPLIED PESTICIDES 2) MEMO DBCP CONTAMINATION 3) GUIDANCE FOR ETHYLENE DIBROMIDE IN DRINKING H2O	
** RISK ASSESSMENT									
5001	27	CHEMICAL, PHYSICAL & BIOLOGICAL PROPERTIES OF COMPOUNDS PRESENT AT HAZARDOUS WASTE SITES	09/27/85	- CLEMENT ASSOCIATES, INC.	Final	320	2		OSWER #9850.3
5002	27	FINAL GUIDANCE FOR THE COORDINATION OF ATSDR HEALTH ASSESSMENT ACTIVITIES WITH THE SUPERFUND REMEDIAL PROCESS	05/14/87	- PORTER, J.W./OSWER/OERR	Final	22	2	1) SAME TITLE, DATED 4/22/87	OSWER #9285.4-02
5003	27	GUIDELINES FOR CARCINOGEN RISK ASSESSMENT (FEDERAL REGISTER, SEPTEMBER 24, 1986, P.33992)	09/24/86	- EPA	Final	13	2		

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5004	27	GUIDELINES FOR EXPOSURE ASSESSMENT (FEDERAL REGISTER, SEPTEMBER 24, 1986, P. 34042)	09/24/86	- EPA	Final	14	2		
5005	27	GUIDELINES FOR HEALTH ASSESSMENT OF SUSPECT DEVELOPMENTAL TOXICANTS (FEDERAL REGISTER, SEPTEMBER 24, 1986. P. 34028)	09/24/86	- EPA	Final	14	2		
5006	27	GUIDELINES FOR MUTAGENECITY RISK ASSESSMENT (FEDERAL REGISTER, SEPTEMBER 24, P. 34006)	09/24/86	- EPA	Final	8	2		
5007	27	GUIDELINES FOR THE HEALTH RISK ASSESSMENT OF CHEMICAL MIXTURES (FEDERAL REGISTER, SEPTEMBER 24, 1986, P.34014)	09/24/86	- EPA	Final	13	2		
5008	28+	HEALTH EFFECTS ASSESSMENT DOCUMENTS (58 CHEMICAL PROFILES) VOL. 28: ACETONE, ARSENIC, ASBESTOS, BARIUM, BENZO(A)PYRENE, CADMIUM, ETC.	09/01/84	- ORD/CHEA/ECAO	FINAL	1750	2		EPA/540/1-86/001-058
5009	31	INTEGRATED RISK INFORMATION SYSTEM (IRIS) [A COMPUTER-BASED HEALTH RISK INFORMATION SYSTEM AVAILABLE THROUGH E-MAIL--BROCHURE ON ACCESS IS INCLUDED]	/ /	- CHEA	Final	--	2		

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5010	31	INTERIM POLICY FOR ASSESSING RISKS OF "DIOXINS" OTHER THAN 2,3,7,8-TCDD	01/07/87	- THOMAS, L.M./EPA	FINAL	50	2	1) INTERIM PROCEDURES FOR ESTIMATING RISKS ASSOCIATED WITH EXPOSURES TO MIXTURES: 10/86	
5011	31	PUBLIC HEALTH RISK EVALUATION DATABASE (PHRED) [USER'S MANUAL AND TWO DISKETTES CONTAINING THE DBASEIII PLUS SYSTEM ARE INCLUDED]	09/16/88	- OERR/TOXICS INTEGRATION BRANCH	FINAL	--	2		
5013	31	SUPERFUND EXPOSURE ASSESSMENT MANUAL	04/01/88	- OERR	Final	160	1		OSWER #9285.5-1
5014	31	SUPERFUND PUBLIC HEALTH EVALUATION MANUAL	10/01/86	- OERR	Final	500	1		OSWER #9285.4-1
8000	32	ENDANGERMENT ASSESSMENT GUIDANCE [SECONDARY REFERENCE]	11/22/85	- PORTER, J.W./OSWER	Final	11	2		OSWER #9850.0-1
** COST ANALYSIS									
6000	32	REMEDIAL ACTION COSTING PROCEDURES MANUAL	10/01/87	- JRB ASSOCIATES/CH2M HILL	Final	56	1		

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** COMMUNITY RELATIONS									
7000	32	COMMUNITY RELATIONS IN SUPERFUND: A HANDBOOK (INTERIM VERSION)	06/01/88	- OERR	Final	188	2	1) CHAP. 6 OF THE COM. REL. HANDBOOK 11/03/88	OSWER #9230.0-03B
** ENFORCEMENT									
8000	32	ENDANGERMENT ASSESSMENT GUIDANCE	11/22/85	- PORTER, J.W./OSWER	Final	11	2		OSWER #9850.0-1
8001	32	INTERIM GUIDANCE ON POTENTIALLY RESPONSIBLE PARTY PARTICIPATION IN REMEDIAL INVESTIGATIONS AND FEASIBILITY STUDIES	05/16/88	- PORTER, J.W./OSWER	Final	37	2		OSWER #9835.1A
** SELECTION OF REMEDY/DECISION DOCUMENTS									
9000	32	INTERIM GUIDANCE ON SUPERFUND SELECTION OF REMEDY	12/24/86	- PORTER, J.W./OSWER	Final	10	2		OSWER #9355.0-19
** NEW ADDITIONS									
9002	33	INTERIM FINAL GUIDANCE ON PREPARING SUPERFUND DECISION DOCUMENTS	06/01/89		Interim				OSWER #9355.3-02
9005	33	GROUND WATER ISSUE: PERFORMANCE EVALUATIONS OF PUMP-AND-TREAT REMEDIATIONS	/ /	-KEELEY, J.F.					EPA/540/4-89/005

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9009	33	NATIONAL OIL & HAZARDOUS SUBSTANCES POLLUTION CONTINGENCY GUIDANCE, PART 300, 40 CFR CH. 1 (7/1/85 EDITION), pp. 664 - 755	07/01/85			92			
9010	33	SUPERFUND AMENDMENTS & REAUTHORIZATION ACT OF 1986 (SARA)	10/17/86	99TH CONGRESS OF U.S.		130			
9011	1	RISK ASSESSMENT GUIDANCE FOR SUPERFUND - VOLUME 1, HUMAN HEALTH EVALUATION MANUAL (PART A)	12/01/89		INTERIM FINAL				EPA/540/1-89/002
9012	2	RISK ASSESSMENT GUIDANCE FOR SUPERFUND - VOLUME 2, ENVIRONMENTAL EVALUATION MANUAL	03/01/89		INTERIM FINAL				EPA/540/1-89/001A
9013		INTERIM GUIDANCE ON ADMINISTRATIVE RECORDS FOR SELECTION OF CERCLA RESPONSE ACTIONS	03/01/89		INTERIM	85			OSWER 9833.3A
9014		INTERIM GUIDANCE ON COMPLIANCE WITH APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS	07/09/87		INTERIM	9			OSWER 9324.0-05

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9015		CERCLA COMPLIANCE WITH OTHER LAWS MANUAL: PART II - CLEAN AIR ACT AND OTHER ENVIRONMENTAL STATUTES AND STATE REQUIREMENTS	08/01/89		INTERIM FINAL				OSWER 9234.1-02
9016		APPLICABILITY OF LAND DISPOSAL RESTRICTIONS TO RCRA AND CERCLA GROUND WATER TREATMENT REINJECTION SUPERFUND MANAGEMENT REVIEW: RECOMMENDATION NO 26	12/27/89			6			OSWER 9234.1-06
9017		REGION 9 ENVIRONMENTAL PROTECTION AGENCY DRINKING WATER STANDARDS AND HEALTH ADVISORY TABLE	06/01/89			28			
9019		SUPERFUND LDR GUIDE #7: DETERMINING WHEN LAND DISPOSAL RESTRICTIONS (LDRs) ARE "RELEVANT AND APPROPRIATE" TO CERCLA RESPONSE ACTIONS	12/01/89			2			OSWER 9347.3-08FS
9020		RISK ASSESSMENT GUIDANCE FOR SUPERFUND HUMAN HEALTH RISK ASSESSMENT: U.S. EPA REGION IX RECOMMENDATIONS	12/15/89		INTERIM FINAL				

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9021		A GUIDE TO DEVELOPING SUPERFUND RECORDS OF DECISION	05/00/90			4			OSWER 9335.3-02FS-1
9022		GUIDANCE ON REMEDIAL INVESTIGATIONS UNDER CERCLA	06/01/85		FINAL				OSWER 9355.0-06B
9023		GUIDANCE ON FEASIBILITY STUDIES UNDER CERCLA	06/01/85		FINAL				OSWER 9355.0-05C
9025		GROUND WATER POLICY - REGION 9	05/00/89						

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AR NUMBER	DATE yy/mm/dd	FROM/ORGANIZATION	TO/ORGANIZATION	DESCRIPTION/SUBJECT
AR 86	no date	Mississippi Forest Products Laboratory, Bioremediation Group	Environmental Protection Agency - Region IX	Bioremediation demonstration study phase II - field site studies, Weed, California Superfund site (undated)
AR 87	72/04/26	David Joseph California Regional Water Quality Control Board - North Coast		Order # 72-22 waste discharge requirements for Coast Wood Preserving co
AR 88	81/03/26	David Joseph California Regional Water Quality Control Board - North Coast		Order # 81-61 requiring Coast Wood Preserving to cease and desist from discharging wastes contrary to requirements prescribed by order # 72-22
AR 89	83/03/24	David Joseph California Regional Water Quality Control Board - North Coast		Order # 83-29 waste discharge requirements of J H Baxter and co
AR 90	83/05/26	David Joseph California Regional Water Quality Control Board - North Coast		Order # 83-62 requiring J H Baxter & co to cease and desist from discharging wastes contrary to order # 83-29 and 83-39
AR 91	85/07/25	California Regional Water Quality Control Board - North Coast	Louisiana-Pacific Corporation	Order #85-88, waste discharge requirements for Louisiana-Pacific Corp, Ukiah Operation
AR 92	85/07/25	David Joseph California Regional Water Quality Control Board - North Coast		Order # 85-101 waste discharge requirements for Coast Wood Preserving
AR 93	85/12/05	Benjamin Kor California Regional Water Quality Control Board - North Coast		Order # 85-161 requiring J H Baxter & co to cease and desist from discharging wastes contrary or order # 83-29
AR 94	85/12/05	Benjamin Kor California Regional Water Quality Control Board - North Coast		Order # 85-183 requiring Roseburg Forest Products to cease and desist from discharging wastes contrary or order # 84-107

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AR 95	86/05/01	California Regional Water Quality Control Board - North Coast	Roseburg Forest Products	Order #86-46, waste discharge requirements for Roseburg Forest Products Company
AR 96	87/01/08	Benjamin Kor California Regional Water Quality Control Board - North Coast		Cleanup and abatement order # 87-9 for Louisiana-Pacific corp., Ukiah operation
AR 97	89/08/24	Benjamin Kor California Regional Water Quality Control Board - North Coast		Complaint # 89-103 for administrative civil liability in the matter of Louisiana-Pacific corp., Ukiah operation
AR 98	89/09/15	Frank Reichmuth California Regional Water Quality Control Board - North Coast	A Kelly Stalker Louisiana-Pacific Corporation	Ltr: Comments on Louisiana Pacific Corporation, Ukiah Industrial complex storm water recycling project by Peregren Environmental Group
AR 99	90/05/07	Environmental Protection Agency - Region IX		Baxter/IP/Roseburg Superfund site community meeting, College of the Siskiyous, Weed, CA
AR 100	90/05/07	Joe Morgan J. H. Baxter & Company	Environmental Protection Agency - Region IX	Comments on RI/FS and proposed plan fact sheet
AR 101	90/05/07	David Critchfield International Paper Company	Environmental Protection Agency - Region IX	Comments on RI/FS and proposed plan fact sheet
AR 102	90/05/07	Arend Thomas resident City of Weed	Environmental Protection Agency - Region IX	Comments on RI/FS proposed plan fact sheet
AR 103	90/05/07	blank	Environmental Protection Agency - Region IX	Community meeting evaluation
AR 104	90/05/09	Mary Thomas resident City of Weed	Environmental Protection Agency - Region IX	Comments on RI/FS and proposed plan fact sheet

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AR 105	90/05/28	Felice Pace Klamath Forest Alliance	Environmental Protection Agency - Region IX	Ltr: Comments on plan to cleanup soil and groundwater
AR 106	90/06/19	Anthony Landis California Department of Health Services	Mary Masters Environmental Protection Agency - Region IX	Ltr: Review of draft feasibility study & proposed plan for J H Baxter site w/2 review memos by Ed Cargile, 6/19/90
AR 107	90/06/21	James L Grant & Associates, Incorporated	J. H. Baxter & Company	Quarterly monitoring report, first quarter, 1990
AR 108	90/06/21	Joe Morgan III J. H. Baxter & Company	Mary Masters Environmental Protection Agency - Region IX	Ltr: Comments on draft FS
AR 109	90/06/21	Mary Bishop James Grant James L Grant & Associates, Incorporated	Jay C. International Paper Company	Ltr: Progress report on Weed Pilo[illegible] Corrective Action program during 5/90
AR 110	90/06/21	Timothy Lovseth Mary Bishop James L Grant & Associates, Incorporated	Darrell Williams J. H. Baxter & Company	TL: First quarter 1990 rpt: ground-water quality assessment program w/encl
AR 111	90/06/28	Susan Warner California Regional Water Quality Control Board - North Coast	Mary Masters Environmental Protection Agency - Region IX	Ltr: Issues remain to be resolved from revised draft FS dated 4/27/90, memo from John Wondolleck of CDM and ltr from Mary Masters dated 5/16/90
AR 112	90/06/29	ChemRisk	J. H. Baxter & Company	Technical review of USEPA Reg 9 endangerment assessment for Baxter/IP/Roseburg Superfund Site, Weed, CA
AR 113	90/06/29	International Paper Company	Mary Masters Environmental Protection Agency - Region IX	Ltr: Comments on draft FS and Endangerment Assessment (by J H Baxter & Co., International Paper, and Roseburg Forest Products)

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AR 114	90/06/30	Kenoli Oleari Salmon River Concerned Citizens, Berkeley, CA	Mary Masters Environmental Protection Agency - Region IX	Ltr: Comments on feasibility study & cleanup plan for the Baxter Superfund site w/attachment
AR 115	90/07/02	David Kerschner Beazer East, Inc./Environmental Services	Mary Masters Environmental Protection Agency - Region IX	Ltr: Comments on the proposed plan for the J H Baxter Superfund site w/enclosures
AR 116	90/07/02	Pete Bontadelli California Department of Fish & Game	Dan McGovern Environmental Protection Agency - Region IX	Ltr: Comments on draft FS w/details of recommended sampling program for sediment and fish
AR 117	90/07/30	Richard Wenning ChemRisk	Danny Adams International Paper Company	Ltr: Review of groundwater investigations conducted at J H Baxter Superfund site w/marginalia & attached tables 1 - 3
AR 118	90/07/31	Cameron McDonald Ecology & Environment, Inc.	William Lewis Environmental Protection Agency - Region IX	Ltr: Results of sampling of residential areas adjacent to Baxter/IP/Roseburg sites for arsenic &/or chromium in soil w/appendices a - c
AR 119	90/08/10	Jagdish Rughani Mississippi Forest Products Laboratory, Bioremediation Group	Environmental Protection Agency - Region IX	Weed groundwater mikie results, final report for operating period 7/12/90 - 7/19/90 w/marginalia
AR 120	90/08/10	Danny Adams International Paper Company	Mary Masters Environmental Protection Agency - Region IX	Ltr: Summary of information on both soil and groundwater remediation and proposed clean-up levels w/table 1
AR 121	90/08/14	Richard Wenning ChemRisk	Danny Adams International Paper Company	Ltr: Clarification of inaccuracies in preliminary review of groundwater data collected during 4th quarter, 1989 & 1st quarter, 1990 w/tables 1 - 3

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AR 122	90/08/14	Danny Adams International Paper Company	Mary Masters Environmental Protection Agency - Region IX	Ltr: Response to request for groundwater clean-up goals and supplement 8/10/90 ltr re proposed initial clean-up goals for groundwater & soils w/attch
AR 123	90/08/15	Mary Bishop James Grant James L Grant & Associates, Incorporated	Jay C. International Paper Company	Ltr: Progress report on Weed Pilot Corrective Action program during 7/90 w/attch
AR 124	90/08/21	Mary Masters Environmental Protection Agency - Region IX	Dan Shane Environmental Protection Agency - Region IX	Memo: Comments on results of off-site soil sampling
AR 125	90/08/22	Mary Masters Environmental Protection Agency - Region IX	Liese Schadt California Regional Water Quality Control Board - North Coast	Ltr: Response to CRWQCB's comment on FS and Clarification of EPA's position: California Safe Drinking Water and Toxic Enforcement Act is not ARAR
AR 126	90/08/27	James L Grant & Associates, Incorporated	International Paper Company	Laboratory data sheets for 6/22 - 6/19, 1990 influent/effluent water quality data for Weed gw treatment facility w/TL to J Amin, 8/27/90
AR 127	90/09/11	Liese Schadt California Regional Water Quality Control Board - North Coast	Mary Masters Environmental Protection Agency - Region IX	Ltr: Comments on draft Record of Decision
AR 128	90/09/14	Liese Schadt California Regional Water Quality Control Board - North Coast	Mary Masters Environmental Protection Agency - Region IX	Ltr: Comments on draft Record of Decision (ROD) w/attached table showing chemical concentrations in groundwater
AR 129	90/09/14	JJ Lossing, M Bishop James L Grant & Associates, Incorporated	Jay Amin International Paper Company	Ltr: Progress report describing activities on the Weed pilot corrective action program, August 1990 w/attachments