Cenex
FS 33599645

IN THE SUPERIOR COURT OF THE STATE OF WASHINGTON
IN AND FOR GRANT COUNTY

STATE OF WASHINGTON,
DEPARTMENT OF ECOLOGY,

Plaintiff,

v.

CENEX HARVEST STATES
COOPERATIVES,

Defendant.

NO. 01-2-00231-3

ORDER ENTERING CONSENT DECREE

Having reviewed the Consent Decree signed by the parties to this matter, the Motion for Entry of the Consent Decree, the Declaration of Ken Lederman, and the file herein, it is hereby

ORDERED AND ADJUDGED that the Consent Decree in this matter is entered and that the Court shall retain jurisdiction over the Consent Decree to enforce its terms.

DATED this 6 day of March, 2001.

JOHN ANTOSZ
JUDGE
Grant County Superior Court

Exhibit A
Site Diagram

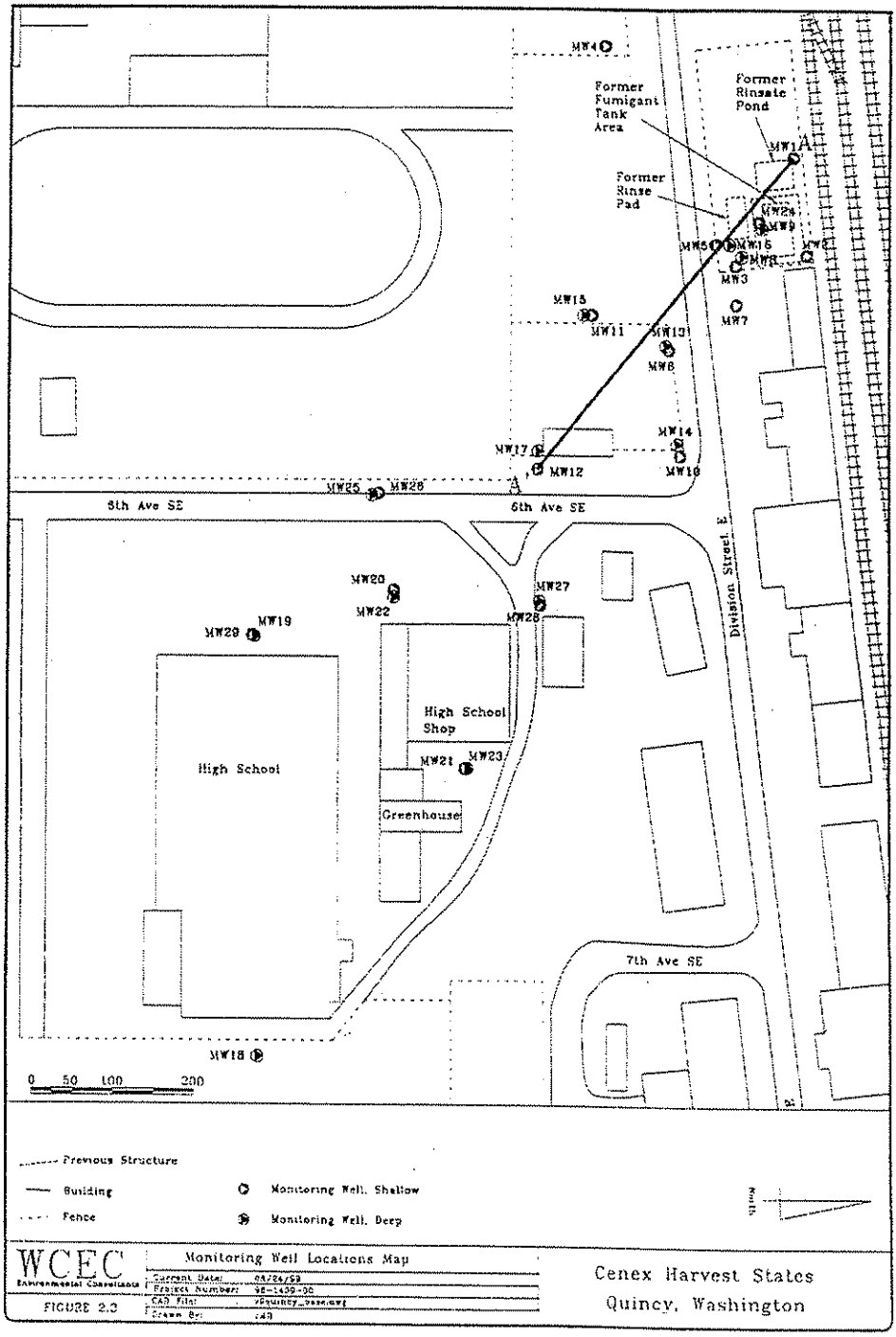

Exhibit B

Final Cleanup Action Plan
Cenex/Quincy Site

Quincy, WA

Washington State Department of Ecology
Eastern Regional Office
Toxics Cleanup Program
February 22, 2001

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1.0 Introduction

This document presents the selected cleanup action for the Cenex/Quincy Site, located at 300 Division Street, between 4th Avenue SE and 6th Avenue SE in the City of Quincy, Grant County, Washington (see Figure 1). The selection of cleanup actions is based upon:

- investigations of the nature and extent of contamination;
- the performance of interim actions at addressing the contamination;
- the feasibility of various remedial actions presented by Cenex Harvest States Cooperatives (formerly Cenex Supply and Marketing, referred to herein as Cenex);
- other relevant information in Ecology files; and
- the requirements of the Model Toxics Control Act, Ch. 70.105D RCW.

Cenex is a potentially liable person for the facility.

The selection of cleanup action is the responsibility of Ecology. The requirements of the Model Toxics Control Act Cleanup Regulation (MTCA; Ch. 173-340 WAC) governing cleanup action plans are outlined in Table 1. The objectives of this document are to:

- Briefly describe the history of the Site;
- Describe the nature and extent of contamination on the Site by summarizing the Remedial Investigation;
- Establish cleanup levels and points of compliance for indicator hazardous substances protective of human health and the environment for the Site;
- Describe proposed remedial alternatives summarized from the Feasibility Study;
- Establish Remedial Action Objectives for the Site; and
- Select and develop a schedule to implement a Remedial Action that meets the Remedial Action Objectives.

Key documents, submitted under Ecology Order DE92HS-903 and Agreed Order DE98TC-E102 include:

West Central Environmental Consultants (WCEC), 1997a: Remedial Investigation Report for Cenex Supply and Marketing Rinsate Pond and Fumigant Storage Facility, Quincy, WA; WCEC Project No. 96-1409-90, dated October 23, 1997

West Central Environmental Consultants (WCEC), 1997b: Supplement to the Remedial Investigation Report for Cenex Supply and Marketing Rinsate Pond and Fumigant Storage Facility, Quincy, WA; WCEC Project No. 96-1409-90, dated November 13. 1997

WCEC, 2000: Feasibility Study for Cenex Harvest States Fumigant Storage Facility; WCEC Project No. 96-1409-90, dated February, 10, 2000.

1.1 Declaration

Ecology has selected this remedy because it will be protective of human health and the environment. Furthermore, the selected remedy is consistent with the preference of the State of Washington as stated in RCW 70.105D.030(1)(b) for permanent solutions.

1.2 Applicability

This Cleanup Action Plan is applicable only to the Cenex/Quincy Site. Cleanup levels have been set and cleanup actions have been chosen for the Site as an overall remediation process being conducted under Ecology oversight using MTCA authority, and shall not be considered as setting precedent for other sites.

1.3 Administrative Record

The documents used to make the decisions discussed in this cleanup action plan are on file in the administrative record for the Site. Referenced documents are detailed in the Reference section. The entire administrative record for the Site is available for public review by appointment at Ecology's Eastern Regional Office, located a N. 4601 Monroe Street, Spokane, WA 99205-1295. References published in journals or by the U. S. Environmental Protection Agency may also be found in local libraries of federal information repositories.

2.0 Site History

The former rinsate pond and fumigant storage facility (outlined on Figure 2) has a history of agricultural activity. The property, currently owned by Burlington Northern Railroad, was part of a livestock operation in the 1950's. It was generally vacant until 1974.

Western Farmers Association built and operated a fumigant/fertilizer plant on the property in approximately 1974. Tanks used at the facility stored products such as the fumigants DD, DD with Chloropicrin, Telone, and Telone C-17. Other tanks stored fertilizers such as UAN 32-0-0, and Aqua Ammonia. A gunnite coated earthen berm served as secondary containment for the tanks. Product was transferred to trucks and other application apparatus outside the containment berm using a pump and hose system.

In 1982, Cenex Supply and Marketing acquired the assets and took an assignment of the Burlington Northern Lease for the real property from Western Farmers Association. Cenex operated the facility for storage and distribution of agricultural chemicals until dismantling in 1992.

Fumigants DD, DD with Chlorpicrin, Telone, and Telone C-17 were managed on the property. 1,2-Dichloropropane is a constituent of these fumigants. Fertilizers UAN 32-0-0, Aqua Ammonia, and 9-30-0 were stored at the property prior the 1992 dismantling. In the early 1980's, releases of soil fumigants are reported to have occurred

Cenex constructed a rinsate pond on the property in 1986. This pond accumulated rinse water until 1988, at which time the pond was drained. In the spring of 1990, the water and rinsate residue were tested and land applied, while the pond and pad were dismantled and backfilled.

Between August 1994 and February 1995, all former fumigant storage tanks were decontaminated and removed by Cenex. In 1997, rinsate pond soils and stockpiled concrete were removed from the property and the Site was covered with six inches of gravel. In 1998, a soil vapor extraction system and pilot scale operation of a ground water air sparge system began operation as an interim action.

3.0 Site Investigations

3.1 Actions taken under Washington State Dangerous Waste Regulations (Ch. 173-303 WAC)

On April 6, 1992, following a facility visit, Ecology issued Compliance Order DE92HS-903 to Cenex requiring a Site Assessment Plan for the Site, specifically in and around the former rinsate pond. The initial plan was submitted on July 24, 1992.

The United States Environmental Protection Agency (EPA) conducted a Site assessment on the property on May 10 and May 11, 1993. The purpose of the Site assessment was to collect data to be used to confirm the presence or absence of target Resource Conservation and Recovery Act (RCRA) listed compounds to determine if violations of RCRA and/or the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) had occurred.

On May 19, 1993, Ecology requested that Cenex properly dispose of the fumigant tanks and the sludge contained in the tanks. The tanks were removed between August, 1994 and February, 1995. A revised Site assessment plan was completed on April 7, 1995 including the fumigant storage facility area and adjacent soil. Site assessment fieldwork began in June of 1995.

The 1995 Site assessment focused on concrete and soils in the rinsate pond, rinse pad, and fumigant storage facility containment areas. Over 100 soil and concrete samples were collected from 26 locations. Chemical analysis of those samples focused on herbicides and metals found during the EPA Site investigation: alachlor, trifluralin, disulfoton, atrazine, vernolate, beryllium, cadmium, and chromium. The fumigants 1,2-Dichloropropane (1,2-D), 1,3-Dichloropropane (1,3-D) and nitrogen compounds nitrate and ammonia were also investigated.

Additionally, nine ground water monitoring wells, numbered MW1- through 9, were installed as a part of this Site assessment in three phases between December of 1995 and

October of 1996. Initial sampling covered the same chemicals as the soil investigation, including the soil fumigants and nitrogen compounds.

The results of the above investigations are found in the Remedial Investigation Report (WCEC, 1997a).

Stockpiled soils and concrete were removed from the Site in May of 1997. Further investigations were conducted to determine chemical constituents in remaining soil. Additionally, a soil gas survey was conducted to determine the extent of 1,2-D vapors in soil, and to evaluate the physical properties of unsaturated soils controlling movement of those vapors. Four monitoring wells (MW-10 through –13) were installed to further define the breadth and extent of the 1,2-D plume in the ground water downgradient from the Site.

The results from these investigations are found in the Supplement to the Remedial Investigation Report (WCEC, 1997b).

Since the Supplement was completed, additional ground water monitoring wells have been installed to further define the extent of the 1,2-D plume and other volatile organic chemicals in the area (WCEC, 1999). Most wells off of Cenex-controlled property are installed in pairs with one well in the upper portion of the shallow ground water approximately 20 feet below ground surface, and one well in the lower portion of the shallow ground water, approximately 40 feet below ground surface. Some 29 wells are currently in place (Figure 2).

In late 1997 and early 1998, a vapor sampling effort was conducted in Quincy High School, to determine potential exposure to chemicals released from ground water. Vapor probes were installed in soils to test subsurface gas, and a test using passive organic vapor monitoring badges was conducted in and around Quincy High School. Results indicated that levels of 1,2-DCP in soil gas were highest in soils on Cenex-controlled property. Low concentrations of 1,2-DCP in soil gas were detected on Quincy High School property. One passive badge (out of 11 samples) returned a detection of 1,2-DCP, near the detection limit of the method, in Quincy High School.

3.2 Actions taken under the Model Toxics Control Act (Ch. 173-340 WAC)

On July 22, 1998, Ecology and Cenex entered into Agreed Order DE98TC-E102, to conduct Site investigation and cleanup activities under the authority of the Model Toxics Control Act, Ch 70.105D RCW. The Order required installation of wells and soil borings to define the extent of the contamination in ground water; implementation of a regular schedule of ground water sampling; implementation of soil vapor extraction (SVE) as an interim action to remove and destroy volatile organic compounds from the soils on the Cenex-controlled property; and evaluation of various ground water treatment technologies.

Also in 2000, the Washington Department of Health (WDOH) completed a formal Health Assessment for the facility (WDOH, 2000). The draft Health Assessment noted that the results of environmental investigations since 1993 confirmed the presence of contaminants in soils, ground water, and soil gas extending off Cenex-controlled property. After evaluation of environmental data, WDOH concluded that no apparent public health hazard existed for adults or children who could have been exposed through ingestion or skin contact to contaminants detected in soil. WDOH also concluded no current public health hazard exists for exposure to contaminated ground water, though a future health hazard may exist if exposure to ground water occurs through domestic uses. WDOH concluded that no apparent public health hazard exists for persons exposed to fumigant chemicals detected in indoor air. However, based upon results of the limited indoor air-sampling event, WDOH recommended additional air sampling to confirm the passive-method results.

Data gathered during these investigations and interim actions are presented in the Feasibility Study (WCEC, 2000). The Feasibility Study analyses alternative solutions to environmental issues on the Site. Those issues are summarized below.

4.0 Summary of Environmental Issues

Results of the various investigations discussed above are summarized in the Feasibility Study (WCEC, 2000) and below.

4.1 Site Geology

Ground water on the Site exists within unconsolidated surficial deposits consisting of unconsolidated fine sands and silts overlying basalt flows of the Columbia Lava Plateau.

The unconsolidated deposits on Site consist of intercalated gravel, sand, fine sand, and silt, reported to be glaciofluvial, lacustrine, and eolian in origin. In the Quincy area, carbonate cement (caliche) is present in variable amounts in the vicinity of the ground water table. Caliche weakly cements the silts and sands. The caliche in the vicinity of the water table is not a primary sedimentary unit. It is a modification of existing sediments by introduction of secondary calcium carbonate through evaporation of ground water. Total percent calcium carbonate, based upon visual observation, is quite variable both laterally and vertically on the Site.

Unconsolidated deposits overly basalts of the Wanapum formation, which extends to 600 feet below ground surface. Numerous interflow zones are found within the individual flows of the Wanapum basalt.

A geologic cross section of the Site is shown on Figure 3.

The surface of the Cenex-controlled property is approximately 2 feet of gravel imported as a barrier to wind transport of Site soils. Surface conditions of other portions of the Site

are gravel parking lots, lawns, and paved streets. Structures cover portions of the extent of chemicals on Site (Figure 4).

4.1.1 Ground Water

4.1.1.1 Regional Ground Water

Ground water in the Quincy Basin is part of the Columbia Lava Plateau ground water region, as denoted by the United States Geologic Survey. Water bearing strata (aquifer) are primarily basalts and sedimentary interbeds of the Columbia River Group, including the Wanapum Basalts. Water moves laterally through flow margin and interflow sedimentary deposits, and vertically through faults, fractures, and other discontinuities through the basalt flows. Ground water in the area is recharged through rainfall, and artificially stored from irrigation return and discharge to ground from features of the Columbia Basin Irrigation Project. Ground water discharges generally to the Potholes Reservoir.

By rule, Ecology established two primary management units in this aquifer: (1) a zone of unconsolidated surficial deposits and shallow basalt (the shallow management unit), and (2) a zone of basalt bedrock (the deep management unit). "Shallow management unit" is defined in WAC 173-134A-040(9) as "the ground water hydraulically continuous between land surface and a depth of 200 feet into the Quincy Basalt zone and includes all of the Quincy unconsolidated zone." Prior to construction of the Columbia Basin Irrigation Project, ground water levels were below the unconsolidated materials. Thus, water in the shallow management unit is considered to be artificially stored.

WAC 173-134A-080 specifically reserves waters of the shallow management unit in the Quincy Basin Subarea for withdrawal for domestic and group domestic uses.

4.1.1.2 Site Ground Water

The water table on Site is about 16 feet below ground surface, sloping to the southeast (Figure 5). The ground water table slopes at about 0.002-0.003 feet per foot toward the southeast. Hydraulic conductivity of these soils, obtained from a pumping test conducted on MW-3, indicates hydraulic conductivity values between 6.67 and 14.5 feet per day. The rate of ground water flow in a southeast direction ranges between 24 and 52 feet per year.

Municipal well 5 is the only drinking water well located downgradient from the Site. All Quincy municipal wells obtain water from the saturated basalt and interflow sediments of the deep management unit. Well 5 located over 2000 feet downgradient and is screened about 400 feet below ground surface.

4.2 Nature and Extent of Chemical Residues

Chemical residues remaining on Site are found on Site in three media. The three media are chemicals in unsaturated soils, vapor phase chemicals in the soil gas, and aqueous phase chemicals in ground water. A conceptual drawing, Figure 6, illustrates the interrelationships of the chemical bearing media.

4.2.1 Unsaturated soil

Figure 7 indicates the areas of the Site where chemicals were either measured or presumed to exceed cleanup levels prior to interim action. These areas coincide with the areas surrounding the former fumigant storage area and the former rinse pad. Assuming a 15-foot depth to ground water, and a surface area approximately 100 feet by 100 feet, about 5500 cubic yards of soil will require remedial action.

4.2.2 Soil vapor

Figure 8 indicates the area where Volatile Organic Chemicals (VOCs) affect soils at levels of concern. These areas coincide with the areas surrounding the former fumigant storage area and the former rinse pad. Additional vapor sampling, not shown on that figure, was done prior to implementation of the SVE system. The additional vapor sampling detected low concentrations of fumigant chemicals in soil gas near Quincy High School (WCEC, 1998).

4.2.3 Ground Water

Figure 4 indicates the inferred boundaries of the extent of volatile organic chemicals in ground water. The chief chemical present in ground water is 1,2-D, as discussed below. The boundaries are inferred from all available data, and are not segregated by depth. Upper aquifer analyses are shown on figure 9, and lower aquifer analyses are shown on figure 10.

4.2.4 Contaminant transport

Chemicals are transported from soil to ground water via two major mechanisms; (1) vapor phase transport; and (2) advective transport of chemicals to the water table. Once ground water comes into contact with chemical vapors or with non-aqueous phase liquids, chemical solution processes transfer a proportion of chemical to aqueous phase. In the aqueous phase, these chemicals are available for transport by the ground water. The major chemicals present on the Site have a high affinity for sorption to aquifer materials and generally low solubilities. Observed chemical concentrations of 10% of the chemical solubility or more are general indicators of the presence of non-aqueous phase material in the immediate vicinity of the measuring point.

Observed relationships between the area of impacted soils and the ground water plume clearly indicate soils in the former rinse pad and fumigant storage facility are the source of ground water contamination at this Site.

4.3 Risks to human health and the environment

Risks to human health and the environment result from human or environmental exposure to hazardous substances. These exposures occur through pathways. Pathway analysis considers the source of hazardous substances, the chemical and physical characteristics of the hazardous substance, and the site characteristics of as geology and land use that may result or preclude human or environmental exposure.

In each pathway, the characteristics of the receptor are identified. The receptor can be a human being or an environmental concern. MTCA uses standard assumptions on receptor characteristics to evaluate risks from hazardous substances.

In terms of land use, the former fumigant facility is located in an agricultural/industrial corridor, immediately adjacent to a railroad. Other portions of the Site encompass similar commercial property or Quincy High School. Students at Quincy High School pass by the Site regularly on their way to and from nearby residences. Quincy High School and nearby residences make the receptors most similar to those in a residential setting.

The hazardous substances are agricultural chemicals of several groups, including herbicide residues, fertilizers, and soil fumigants. Herbicide residues are generally of low solubility and high sorptive power such that they tend to bind to soil particles. Fertilizers generally have relatively high solubility, but are often nitrogen compounds, which are of relatively low toxicity. Soil fumigants are soluble compounds, but are often volatile. They are generally quite stable and resistant to biologic decomposition.

The Feasibility Study (WCEC, 2000) included an assessment of risk from the chemicals at the Site. Because interim actions covered the Site with soil to minimize windborne transport of contaminated soil particles, only two pathways were considered operative: (1) direct contact by on-Site workers to contaminated soils and (2) ground water.

WDOH evaluated these pathways in the Health Assessment (WDOH, 2000). WDOH also evaluated residential exposure to off-property ground water and soil gas. WDOH concluded that off-property ground water was not a currently complete pathway, but required action to ensure that it remains incomplete. WDOH recommended institutional controls on ground water withdrawal in the area. Off-property soil gas was partially evaluated, but additional evaluation was recommended to ensure protection.

4.4 Conceptual Site Model

A conceptual Site model is a picture of contamination at the Site, based upon the occurrence of chemicals, their physical and chemical properties and transport considerations, and exposure pathways. The conceptual Site model is illustrated on Figure 6.

5.0 Cleanup Standards

The cleanup standard development process determines the concentration of hazardous substances that must be reached at the Site to be protective of human health and the environment as well as the locations where those concentrations should be attained. First, indicator hazardous substances are determined. Indicator hazardous substances represent a threat to human health and the environment at the Site. Secondly, cleanup levels are established for Site indicator hazardous substances. Cleanup levels are concentrations that must be attained by the remedial action to protect human health and the environment. Cleanup levels are calculated in accordance with risk-based exposure assumptions in MTCA. Third, the point of compliance is established. The point of compliance is the location where cleanup levels must be attained before the Site can be considered clean.

5.1 Indicator Hazardous Substances

Indicator hazardous substances are established for each chemical in each medium of concern at the Site. At the Cenex/Quincy Site, Ecology has determined that two media are contaminated: soil and ground water.

Soil vapor is not included as a medium of concern under the MTCA, as exposure to chemicals is generally from ingestion or direct contact with that medium. Soil vapor exposures are considered when air exposure has been demonstrated.

A hazardous substance should be considered for regulation under the MTCA if the maximum concentration of that substance is greater than its cleanup level calculated through the appropriate method formula, or if the maximum concentration exceeds levels found in applicable state or federal laws [WAC 173-340-705(2)].

5.1.1 Modifying characteristics

Not all substances exceeding a cleanup level are regulated. Factors outlined in WAC 173-340-708(2)(b) are used to determine whether a substance is retained as an indicator hazardous substance for analysis of overall Site risk. These factors are:

1. The concentration of the substance. Substances with concentrations marginally above their cleanup levels may not be important in considerations of overall hazard and risk.
2. The frequency of detection of the substance. It may be appropriate to eliminate compounds detected with a frequency of less than 5 percent.
3. The toxicity of the substance. It may be suitable to delete substances of low toxicity.
4. Environmental fate. Substances that readily degrade in the environment may not be of importance to overall hazard or risk. Conversely, those with highly toxic degradation products should be included in an analysis of overall hazard and risk.
5. The natural background concentration of the substance. MTCA regulates risks due to substances found at contaminated waste sites. Risks caused by substances at background concentrations are not addressed by MTCA.

6. The mobility and potential for exposure to the substance. Substances may be eliminated from consideration as indicator hazardous substances if these parameters are low.

5.2 Method Analysis and Indicator Hazardous Substances

For both ground water and soil, cleanup levels are based upon estimates of the highest beneficial use of the resource, and on the reasonable maximum exposure under current and potential future use scenarios. The MTCA specifies reasonable maximum exposures for individual current or potential future land uses.

5.2.1 Ground Water Method Analysis

As noted in section 4.1.1.1, Ecology specifically reserves waters of the shallow management unit in the Quincy Basin Subarea for withdrawal for domestic and group domestic uses. Ground water cleanup levels shall be based on estimates of the highest beneficial use and the reasonable maximum exposure expected to occur under current and potential future Site uses [WAC 173-340-720(1)(a)]. At this Site, drinking water is the beneficial use requiring the highest quality of ground water. Ingestion of drinking water and other domestic use is the reasonable maximum exposure.

Method B values [WAC 173-340-720(3)] provide the appropriate standards to compare with Site chemical concentrations. Method A values [WAC 173-340-720(2)] are also appropriate to protect drinking water if relatively few hazardous substances exist on Site, or if chemical-specific health information for a chemical mixture is unavailable.

5.2.2 Ground Water Indicator Hazardous Substances

Table 2 details chemicals detected in ground water, and their associated protective chemical levels. Those chemicals in boldface exceed either the Method B formula value or a standard developed under applicable state or federal law (ARAR) for ground water quality.

Several fumigant constituent chemicals are present at levels of concern. These are 1,2-Dichloropropane (1,2-D), 1,3-Dichloropropene, 1,2,3-Trichloropropane (1,2,3-T), and 1,2-Dibromoethane (EDB).

The chlorinated solvents Carbon tetrachloride, Chloroform, chloromethane, 1,2-Dichloroethane, 1,1-Dichloroethene, 1,1,2-Trichloroethane and vinyl chloride exceed applicable standards.

Carbon tetrachloride, Chloromethane, and 1,3-Dichloropropene were detected in less than 5% of samples, and will not be retained as indicator hazardous substances in this medium. 1,1-Dichloroethene was detected in only 6% of samples, the majority of which are in MW-3, the most contaminated well on the property. As 1,1-Dichloroethene is apparently of low mobility in this environment and is often readily treatable using

traditional treatment methods for VOCs, it will not be retained as an indicator hazardous substance in this medium.

Vinyl chloride and EDB have similar detection frequencies and are of relatively high toxicity so will be retained as indicator hazardous substances. These solvents and the remaining soil fumigants will be retained as indicator hazardous substances in ground water.

5.2.3 Soil Method Analysis

Soil cleanup levels are also based upon estimates of reasonable maximum exposure expected to occur under both current and potential future uses of the Site. Generally, soils in the top 15 feet of the soil column are presumed to be available for ingestion into the body. This is the direct contact pathway. Chemical concentrations are established to protect the health of individuals who may come into contact with those soils. In a residential setting where children may contact soil over a long period of time, acceptable concentrations are low. In an industrial or commercial setting where adult Site workers would contact the soil over shorter periods of time, higher concentrations are allowed.

While this Site is zoned for manufacturing uses, it is in close proximity to land zoned residential, and very close to both the junior high and high schools in Quincy. Soil chemical standards under MTCA Method B [WAC 173-340-740(3)(ii)] are appropriate for sites which are currently or potentially used for as residential uses.

Chemicals in soil transfer to ground water by leaching, advection, or other mechanisms. Allowable chemical levels for soil must not cause contamination or degradation of ground water quality regardless of zoning or land use. This "soil to ground water pathway" requires all established chemical levels protect the ground water resource, regardless of depth. Generally, concentrations of soil that protect ground water quality are much lower than the levels necessary to protect human health through direct contact.

Soil chemical levels protective of ground water can be determined several ways. First, Method A soil values [WAC 173-340-740(2)] are generally presumed to be protective of ground water. Alternatively, Method B values [WAC 173-340-740(3)(ii)] can be determined either by making a detailed technical demonstration that a concentration will be protective after analysis of appropriate chemical and physical factors, or by simply multiplying the ground water cleanup level times 100. This "100-X" rule is generally presumed to be the most conservative way of establishing concentrations of chemicals in soil which protect ground water quality.

5.2.4 Soil Indicator Hazardous Substances

Table 3 details the chemicals detected in soil at the Site and their associated protective concentration levels. Alachlor, and Atrazine were detected at levels which exceed ground water protection values. These chemicals were not broadly tested, but were never detected in ground water, and most of these chemicals were removed from Site soils in

the interim action. Trifluralin, Disulfoton and Vernolate exceed both the ground water protective value and slightly exceed their corresponding Method B health-based formula values. Trifluralin, Disulfoton and Vernolate were also not detected in ground water and most soils containing these chemicals were removed during interim action. Beryllium exceeds ground water protection standards, but is present below natural background values. The above chemicals will not be retained as indicator hazardous substances.

Detected levels of 1,2-D, 1,1,2-trichloroethane, and 1,2,3-trichloropropane exceeded their various ground water protection standards, are present in ground water, and will be retained as indicator hazardous substances. Table 4 contains the cleanup levels established for these substances at this Site.

5.3 Points of Compliance

The Point of Compliance is defined in the MTCA (WAC 173-340-200) as the point or points where cleanup levels established in accordance with WAC 173-340-720 through WAC 173-340-760 shall be attained. Once those cleanup levels have been attained at that point, either through treatment or containment, the Site is no longer considered a threat to human health and the environment.

5.3.1 Site Definition

Site is defined in MTCA as "any building ... site or area where a hazardous substance, other than a consumer product in consumer use, has been deposited, stored, disposed of, or placed, or otherwise come to be located." For this Site, this area is generally defined by the area affected by 1,2-Dichloropropane in soil and ground water, as shown on Figure 4.

5.3.2 Soil

All chemicals listed on Table 4 which exceed their respective Method B cleanup levels will be the subject of remedial action. For human exposure, the point of compliance is that point at which direct contact with contaminants can occur. At this point, chemicals can be absorbed through the skin or ingested by eating or breathing contaminated soils. Levels set to protect ground water quality are set throughout the Site, to prevent leaching of hazardous substances to ground water. All soils on Site regardless of depth which contain hazardous substances above Table 4 cleanup levels will need to be addressed by the remedial action.

5.3.3 Ground Water

The point of compliance in ground water is defined in WAC 173-340-720(6)(b) to be the uppermost level of the saturated zone extending vertically to the lowest most depth potentially affected by the Site. That point is established throughout the Site, from the uppermost level of the saturated zone extending vertically to the lowest most depth which could potentially be affected by the Site. If hazardous substances remain contained on

Site as part of the cleanup action, a conditional point of compliance may be established as close as practicable to the source of the hazardous substances [WAC 173-340-720(6)(c)]. That conditional point of compliance may not exceed the property boundary, in order to ensure the quality of ground water and the performance of the containment system.

The soil near the former fumigant storage facility is the source of hazardous substances at the Site. Most cleanup alternatives call for treatment of these soils rather than on-site containment. Implementation of these treatment actions as proposed represents all practicable methods of treatment that can be utilized for site cleanup. The property boundary is very close to the source. Once all chemical detections in ground water at the downgradient property boundary on Site attain cleanup levels in accordance with applicable regulation, the Site will be considered clean.

5.4 Final Cleanup Standards

Cleanup standards for chemicals at the Site are presented on Table 4. Several chemicals are not quantifiable using standard EPA methods at the Method B health based standard. In accordance with WAC 173-340-707(2), the cleanup level from those substances is set at the practical quantitation limit (PQL) for the method. If the PQL is lowered during cleanup of the Site or during periodic review, the regulatory limit will be adjusted downward to reflect the lowest achievable PQL that is in excess of the cleanup level for those compounds [WAC 173-340-707(4)]. If no improvement in technology occurs, achieving the PQL shall be considered to have achieved the actual cleanup level concentration [WAC 173-340-707(2)].

No parameters were retained for analysis based upon non-carcinogenic effects, so no hazard quotient is calculated. For carcinogenic risk, the total Site risk calculated does not exceed the maximum acceptable Site risk from all chemicals in all pathways of 1×10^{-5} [WAC 173-340-705(4)].

The point of compliance for ground water is the ground water table. All ground water wells must achieve cleanup levels in ground water. In soil, cleanup levels must be achieved in all Site soils, or be contained to a point no further from the source than the property boundary.

6.0 Proposed Cleanup Action

6.1 Remedial Action Objectives

Remedial Action Objectives are goals for protecting human health and the environment. They are developed considering the characteristics of the contaminated medium, the characteristics of the hazardous substances present, migration and exposure pathways, and potential receptor points from the conceptual Site model (section 4.4, Figure 6) and from cleanup level analysis in section 5. Remedial Action Objectives provide a statement of necessary actions, which are used to evaluate potential remedial actions.

Remedial Action Objectives, as modified from the Feasibility Study (WCEC, 2000) in consideration of the conceptual Site model and cleanup levels, are:

1. Eliminate direct contact with soils bearing chemicals above cleanup levels.
2. Eliminate direct contact with and ingestion of ground water containing chemicals of concern above cleanup levels.
3. Eliminate transfer of chemicals from soils to ground water to protect beneficial uses
4. Restore beneficial uses of ground water at the point of compliance
5. Evaluate, and if necessary eliminate, exposure to chemical-bearing soil gas

6.2 Summary of Feasibility Study Cleanup Action Alternatives

Cenex presented alternatives to address Site contamination and meet the above remedial action objectives in the Feasibility Study (WCEC, 2000). Individual actions considered include a no action alternative for baseline comparison. Alternatives 3 through 5 are "soil only" Alternatives, while Alternatives 6 through 8 are "ground water only" Alternatives. Alternative 2 addresses all media through passive controls, while Alternative 9 addresses cross-media transfer through active removal methods.

Alternative 1: No Action
Alternative 2: Institutional Controls and Monitoring of Natural Degradation
Alternative 3: Asphalt Capping of Site Soils
Alternative 4: Excavation of Impacted Soils
Alternative 5: Soil Vapor Extraction of Soils above the Caliche
Alternative 6: In-Situ Air Stripping (Micro-Sparge) of Ground Water
Alternative 7: Oxygenation of Ground Water using Air Sparge
Alternative 8: Ground Water Containment and Treatment
Alternative 9: Aquifer De-Watering and Soil Vapor Extraction

Alternative 1: No Action

No Action is not effective at reaching any remedial action objective. As such, it provides a baseline for comparison to evaluate other actions.

Alternative 2: Institutional Controls and Monitoring of Natural Degradation

This action controls exposure through fencing of Cenex property and legal mechanisms preventing ground water withdrawal for domestic use. The area and elements are shown on figure 12. Contaminant destruction in both soil and ground water is to be documented and tracked through a monitoring program, with ongoing assessment of the risk to human health and the environment.

The actions in this Alternative are included in all other Alternatives.

Alternative 3: Asphalt Capping of the Site

This action includes, in addition to elements of Alternative 2, installing an asphalt pavement over Cenex- property soils. The area of asphalt capping is shown on Figure 12. The asphalt cap would interrupt any direct contact with these soils, and contain them over time. If used in conjunction with SVE, the purpose of the asphalt cap is to increase the efficiency of the SVE system by decreasing the amount of ambient air pulled from the surface.

Alternative 4: Excavation of Impacted Soils

This action includes, in addition to Alternative 2, excavation of chemically impacted soil above the caliche. The area of excavation is slightly smaller than that area to be capped in Figure 12. Approximately 8000 cubic yards of soil above the water table would be removed and disposed at a permitted disposal facility.

Alternative 5: Soil Vapor Extraction of Soils above the Caliche

This action is a continuation of the existing Soil Vapor Extraction (SVE) system installed in 1998, including the elements of Alternative 2. The area of soils to be treated is illustrated on Figure 13. Changes to the operational system, including pulsing of the system, should increase recovery effectiveness. Soil vapors collected are treated by carbon adsorption prior to discharge in accordance with applicable state and federal laws and regulations.

Alternative 6: In-Situ Air Stripping (Micro-Sparge) of Ground Water

This action involves a high-efficiency air sparging system, coupled with enhanced soil vapor extraction. Each ground water well would serve as a sparge/extraction couplet, which would both sparge and recover dissolved and free-phase chemicals from ground water and oxygenate ground water to enhance biologic destruction. Well design and the area of operation are illustrated on Figure 14. Recovered vapors will be treated prior to discharge in accordance with applicable state and federal laws and regulations. The actions in Alternative 2 are included with this system.

Alternative 7: Oxygenation of Ground Water using Air Sparge

This action is a continuation and minor expansion of the SVE system installed in 1998. Data indicates the SVE system is reducing chemical concentrations downgradient of the system. (See Ecology, 2000, or WCEC, 2001 fig.4.1) The location of installed systems is illustrated on Figure 15. The actions in Alternative 2 are included with this system.

Alternative 8: Ground Water Containment and Treatment

This action employs ground water pumps to extract ground water and a system of aeration or filtration to recover chemicals. Once treated, ground water would be conveyed to a permitted treatment facility, most likely the City of Quincy municipal

w vater treatment plant. The effective capture radius of the system is shown on Figure 17. Alternative 2 actions are included.

Alternative 9: Aquifer De-Watering and Soil Vapor Extraction

This action removes ground water from the Site by pumping, and extracts chemicals inside the formerly saturated soils by SVE. Micro-sparge equipment would flank the pumping well, thereby oxygenating the ground water, and extracting vapor phase chemicals from unsaturated soils. Vapor discharge will be treated as in Alternative 6, and water recovered would be treated similar to Alternative 8. Alternative 2 actions are included.

6.3 Proposed Preferred Alternative

In the Feasibility Study (WCEC, 2000, Section 9) Cenex proposed implementation of several Alternatives to address Site contamination. Cenex proposed a combination of alternatives 3 (asphalt capping) and 5 (SVE) to address soil contamination, and alternatives 5 and 6 (SVE/Microsparge) to address ground water contamination, along with institutional controls and monitoring (Alternative 2). This Cleanup Action Plan evaluates the individual actions in detail in Section 8.

7 CLEANUP ACTION CRITERIA

The Model Toxics Control Act Cleanup Regulations describe the requirements for selecting cleanup actions (WAC 173-340-360). Included in these requirements are criteria for approving cleanup actions, policies regarding permanent solutions, and the order of preference for cleanup technologies. All cleanup actions must meet the following four threshold requirements:

7.1 Threshold Requirements [WAC 173-340-360(2)]

1. Protect Human Health and the Environment
2. Comply with Cleanup Standards
3. Comply with Applicable State and Federal Laws
4. Provide for Compliance Monitoring

7.2 Other Requirements [WAC 173-340-360(3)]

The selected cleanup action must also:

- Use permanent solutions to the maximum extent practicable
- Provide for a reasonable restoration time frame
- Consider public concerns raised during public comment on the draft cleanup action plan.

The following discussion of the requirements of WAC 173-340-360(3) considers only Alternatives 3 through 9.

8.2.1 Use permanent solutions to the maximum extent practicable

The MTCA regulation gives preference to permanent solutions to the maximum extent practicable. A permanent solution meets cleanup standards without requiring further action. The criteria for evaluating whether a solution is permanent to the maximum extent practicable are discussed below, and shown in Table 6. Table 6 compares the proposed Alternatives using a qualitative 1 (least favorable) to 10 (most favorable) scale of preference.

8.2.1.1 Overall protection of human health and the environment

This term is the degree to which existing risks will be reduced and beneficial uses protected. It includes consideration of the time necessary to reduce risk and reach cleanup standards, risks to all site properties related to the action, and the chances that the cleanup may perform to higher standards than cleanup standards.

Potential risk at this Site, discussed in section 4.2, are

- Human exposure to on-property soil;
- Human exposure to on- and off-property ground water;
- Exposure to subsurface vapor.

In soil, Alternative 3 is slightly less protective than Alternative 5 and 6, because Alternative 3 alone does not remove or destroy chemicals, thus a potential future exposure risk exists. Alternative 4 removes the soil and entrained chemical, but in the process may expose on Site workers and off-property individuals to airborne dust and volatilized chemicals. Alternative 5 has proven effective at removing chemicals from soils while minimizing exposure to those chemicals, at the cost of some time.

In ground water, all Alternatives are designed to ultimately remove chemicals and return the ground water to beneficial use. Alternative 6 is essentially a modification and enhancement of Alternative 7, and is thus slightly more favorable. Alternatives 8 and 9 both remove ground water, generating a slight risk of exposure, need for treatment, and resource consumption, so a slightly lower score. Alternative 9 ranks slightly higher than 8 because even though the water is consumed, SVE removes chemicals from formerly saturated soil.

No single Alternative addresses all Site issues, so no single Alternative is preferred. Cleanup actions often involve the use of several cleanup methods [WAC 173-340-360(1)(b)].

8.2.1.2 Long term effectiveness

This term is a measure of both the degree of certainty that the action will be successful and the magnitude of residual risk.

In soil, Alternative 4 (excavation) ranks highest, as soil and entrained chemicals are removed and confirmation monitoring is straightforward. Residual risk is very low. Alternative 5 (SVE) has been demonstrated effective, but the residual risk is less certain of being very low. Alternative 4 ranks lowest, as capping removes no chemicals, relying on institutional controls to contain residual risk.

In ground water, Alternatives 6 and 7 rank equally. Microsparge should increase the effectiveness of ground water oxygenation and physical phase transfer done in sparging. These technologies are generally uncertain because the effectiveness of the technology is not clear and convincing. Alternatives 8 and 9, both pump and treat actions, rank lower yet, because the ability to draw down this aquifer has only been modeled, not determined empirically on Site. Physical capture of the 1,2-D plume may not be possible as proposed.

8.2.1.3 Short Term effectiveness

This term is a measure of the protection of human health and the environment during implementation of the work.

In soil, Asphalt capping and soil vapor extraction (Alternatives 3 and 5) rank equally because of the minimal movement of soil necessary, thus the less risk of volatilization and release to air. Excavation ranks lowest, because of the potential release to air affecting Site workers and adjacent people, and because of increased traffic to accommodate vehicles.

In ground water Alternatives 6 and 7 rank equally because air sparging in the presence of SVE is unlikely to release chemicals to the environment. Alternatives 8 and 9 both involve on-surface treatment plants, piping, and liquids handling which extend the time and complexity of implementation, and a small potential for release from equipment failure.

8.2.1.4 Permanent reduction in toxicity, mobility, and volume of hazardous substances

This term includes analysis of the ability of the Alternative to destroy the hazardous substances, abate the continued release of hazardous substances, reduce the exposure likelihood of residual products, and the characteristics and quantity of treatment residuals.

In soils, Capping and excavation are equivalent. Excavation of soil ranks somewhat low because while excavation can abate the continued release and reduce the exposure likelihood, it does not destroy the substances and it generates the highest volume of residual. Capping does not destroy the substance, though it should abate the release, and reduce exposure likelihood while not generating a significant volume of residual. Soil

vapor extraction will collect and treat chemicals and eliminate vapor-to-water transfer of chemicals. The relatively low volume of treatment residual is treated and the chemicals destroyed.

In ground water Alternatives 6 and 7 both rely on chemical and biologic treatment of dissolved phase chemicals for destruction. As they employ the same principles, they have an equivalent rank, though microsparging is anticipated to have increased performance. Alternatives 8 and 9 rank somewhat higher because the physical collection of these chemicals and subsequent treatment is somewhat more certain to abate the release and destroy the substance, while generating a roughly equal amount of treatment residual (not including water handling).

8.2.1.5 Implementability

This term is a measure of availability of technologies, as well as the availability and complexity of the construction effort

All proposed technologies for soil and ground water remediation are generally available. Excavation of impacted soil (Alternative 4) is slightly more complex than other soil Alternatives because the depth of excavation may require engineering controls to support adjacent structures. Ground water pumping alternatives rank low because little treatment capacity exists to take extracted ground water.

8.2.1.6 Cleanup costs, when selecting between two alternatives having an equivalent level of preference

A cleanup action shall be considered practicable if the incremental cost of the cleanup action is substantial and disproportionate to the incremental degree of protection it would achieve over a lower preference alternative [WAC 173-340-360(5)(d)(vi)]. This means that when two or more alternatives provide the same level of protection, preference may be given to the lowest cost alternative. Table 7 outlines the cost estimates for the various Alternatives.

8.2.2 Provide for a reasonable restoration time frame

Prompt cleanup is mandated by MTCA. Criteria for evaluation of time frames are outlined in WAC 173-340-360(6). At this Site, the toxicity of the substances is fairly high, but the potential risk posed by the Site to human health and the environment is generally low (WDOH, 2000).

Cenex-controlled property is currently used for agricultural equipment storage. The remainder of the properties on Site are commercial, in use as roads or (of most concern) the high school. Future land use is likely to remain this way.

Alternative water supplies are widely available, so institutional controls are likely to be effective at controlling exposure to drinking water and soils. All Alternatives for ground

water contain provisions for monitoring the performance of remediation and containment systems.

Under MTCA, a longer period of time may be used for restoration if higher preference technologies are selected beyond on- and off-Site disposal, isolation, or containment [WAC 173-340-360(6)(b)]. For soil, only Alternatives 3 and 4 (excavation and capping) require containment. These Alternatives rank somewhat lower on these criteria than the soil vapor extraction methods.

The chemical and physical characteristics of 1,2-D limit the ability of known technologies to effectively remedy this release in ground water. This chemical travels slower than water, is not particularly volatile, and its ability to biodegrade in water is poorly understood. For ground water, all Alternatives have some uncertainty regarding their ability to remedy the situation, Ecology considers them equivalent with respect to the time required for cleanup.

8.2.3 Consider public concerns raised during public comment on the draft cleanup action plan

Since remedial actions began under MTCA, significant public concern has been raised during two major public involvement opportunities. During the first period, July 22 through August 21, 1998 for the interim action and feasibility study order, public concern focused on health effects of chemicals released in the past from the Site, and exposure of school attendees to chemicals in ground water. Additional public concern focused on speed of cleanup. In response, WDOH completed the health assessment, and Ecology proceeded with interim actions to remove chemicals from Site soils. Cenex fully complied with the orders. Public availability of all documents has been ensured at both the City of Quincy and Grant County Health District.

Public input was sought in 2000 following completion of the feasibility study and 1 year operation of interim actions. Significant public comment centered on exposure to high school students to potentially contaminated subsurface vapors. Most commentors supported the Cenex preferred Alternative for addressing soil and ground water.

Public notice and opportunity to comment was conducted on the Draft Cleanup Action Plan between January 2 through February 1, 2001. The final date was later extended to February 15, 2001. A public hearing was held on January 24, 2001 at the Quincy Community Center.

Comments received, and Ecology responses, are available in the administrative record for the site, located at Ecology's Eastern Regional Office, N. 4601 Monroe, Spokane, WA.

8.3 Technology Preference

The MTCA specifies that cleanup shall be conducted using technologies that minimize the amount of untreated hazardous substances remaining at a Site [WAC 173-340-

360(4)(a)]. Of those technologies passing threshold criteria, Alternative 6 ranks highest, in that it relies on destruction of chemicals in water, soil, and soil vapor through capture and treatment. Alternative 7 and 5 rank somewhat lower, because the microsparge proposal physically treats more ground water. Ground water withdrawal methods are less preferred, because of the need to dispose of large volumes of water and off-Site treatment and disposal. Excavation of soil is lower yet, as it is a straightforward off-Site disposal option. Asphalt capping involves containment, and thus is the lowest priority.

9.0 Proposed Cleanup Remedy

The Ecology-selected Cleanup Action will proceed following agreement on terms and conditions of a MTCA Consent Decree between the State of Washington and Cenex Harvest States Cooperatives. Ecology proposes acceptance of the Cenex-preferred remedy from the Feasibility Study, incorporating several of the above technologies. The major modification to the proposed remedy is the addition of Air Quality Monitoring in Quincy High School.

Once the Consent Decree is final, remedial design documents will be submitted ("The Remedial Design Phase") and reviewed in accordance with WAC 173-340-400(4). Following public notice and opportunity to comment, those plans will be approved and cleanup construction will begin.

The agreement will provide for the following actions.

9.1 On-property Containment Systems

Asphalt Capping of Site Soils

An asphalt cap will be installed. The general purpose of the cap is to enhance soil vapor extraction efficiency by sealing Site surface soil. Secondary purposes of the cap are to isolate chemical-bearing soils from direct human contact and minimize infiltration of precipitation. Cenex will comply with relevant and appropriate federal, state, and local stormwater management regulations. Final material specifications and design will be submitted and approved during the remedial design phase. The cap shall be constructed in the general area shown on Figure 12.

9.2 On-property Treatment Systems

The following treatment systems will be installed and operated to remove chemicals from contaminated soil and ground water at the Site. These treatment systems will treat soil and ground water to the maximum extent practicable, in accordance with WAC 173-340-360(9)(a), and control systems will comply with relevant and appropriate federal, state, and local air discharge regulations. Practicability of achieving cleanup levels in soil and ground water affected by the release will be reevaluated during periodic review in accordance with WAC 173-340-420 and WAC 173-340-360(7)(b)(vi).

Soil Vapor Extraction of Soils above the Caliche

The existing Soil Vapor Extraction (SVE) system will continue in operation. Operational modifications or system expansions, if proposed, will be evaluated on their ability to increase capture of chemicals in Site soils. Treatment systems will be expanded to ensure capacity, if necessary. Any design or operation modifications will be submitted for approval during the remedial design phase.

Oxygenation of Ground Water by Air Sparging

The current air sparging system will continue in operation. Any operational modifications or system expansions will be evaluated on the ability to increase effective chemical destruction. Such modifications will be reviewed for approval during the remedial design phase.

In-Situ Air Stripping and Microsparge

A Micro-Sparge system shall be installed in the general location described on Figure 14. The objectives of this system will be to: (1) physically remove chemicals from ground water transferring them to the soil vapor extraction component of the system for collection, and (2) to enhance oxygenation of ground water downgradient. Treatment shall be conducted to the maximum extent practicable, in accordance with WAC 173-340-360(7)(b)(i). Operations, maintenance, and monitoring of this system shall be integrated as much as possible with the existing SVE and Air-Sparge systems. Final design will be submitted in the Remedial Design phase.

9.3 Institutional Controls and Monitoring

9.3.1 Institutional Controls

Institutional controls are a vital element of the cleanup action to ensure protection of human health and the environment. Institutional controls shall be placed on all properties included within the Site as indicated on Figure 16 to control exposure to contaminated soil and ground water during treatment and protect the integrity of the cleanup action, in accordance with WAC 173-340-360(9)(d). On-property controls shall include a fencing and capping to limit exposure to soils. Off property controls shall include restrictions on withdrawal and domestic use of ground water.

Draft Restrictive Covenants shall be prepared in accordance with WAC 173-340-440, then reviewed and approved by the Department of Ecology. Land Use Restrictions shall remain in effect until residual hazardous substance concentrations no longer exceed Site cleanup levels at the point of compliance.

Restrictive covenants shall be required on properties illustrated on figure 16 that are owned by the following persons:

J. R. Simplot Company
Cenex Harvest States
Blakal Properties, Inc.
Quincy School District No. 44
Burlington Northern Santa Fe Railroad

In the event Cenex is unable to acquire institutional controls, Ecology will assist in accordance with WAC 173-340-440.

9.3.2 Monitoring

A compliance monitoring plan shall be prepared in accordance with the requirements of WAC 173-340-410 to address the following objectives:

a. Protection Monitoring. Monitoring will be conducted to confirm that human health and the environment are being protected during construction and operation of cleanup action treatment facilities. Soils, excavations, air quality, ground water, and storm water will be addressed. Air discharge from all treatment systems will be monitored in accordance with applicable or relevant and appropriate state and federal laws and regulations. The specifics of the protection monitoring will be provided in a Site Health and Safety Plan.
b. Performance Monitoring: Appropriate ground water and air monitoring will be conducted to evaluate the performance of treatment systems. Chemical and physical measurements will be taken as necessary to evaluate the area of influence and effectiveness of treatment systems.
c. Confirmational Monitoring: Site soils and ground water downgradient of the Site will be monitored to confirm the effectiveness of treatment systems.

9.3.3 Air Monitoring Evaluation of Quincy High School

Air monitoring will be conducted to determine the impact, if any, of chemical releases from the Site at Quincy High School. Comments by the public (WDOE, 2000) and the Washington Department of Health (WDOH, 2000) emphasize the need for this study, due to the presence of 1,2-D in ground water and soil gas on school property.

In cooperation with the Quincy School District, a scoping-level study of indoor air quality was performed in late August, 2000 (Envirometrics, 2000). No site chemicals of concern were detected in indoor air in Quincy High School. Additional sampling will be conducted to confirm the results of this sampling event.

10.0 Evaluation of Cleanup Action with Respect to MTCA Criteria

10.1 Protection of Human Health and the Environment

The major exposure routes of Site contamination are through ingestion and direct contact with Site soils and ground water. Institutional controls restricting use of contaminated ground water and access to Site soils will provide short-term protection of human health. Treatment of soils and ground water will recover Site chemicals, thus minimizing current and potential future exposure and maximizing protection of human health and the environment.

10.2 Compliance with Cleanup Standards

Performance of the interim action has demonstrated the ability of proposed treatment systems to decrease the available Site chemicals from soils. Should cleanup levels be unattainable, institutional controls and the asphalt cap will serve as containment as required in WAC 173-340-740(6)(d).

Attainment of cleanup levels in ground water through treatment is more problematic. Treatment may not achieve cleanup levels at the point of compliance. When combined with institutional controls on ground water use, this treatment represents a practicable remedial action to treat Site hazardous substances. It will be protective of human health and the environment. Ecology believes that based upon current data and microsparge enhancements to the existing system these actions will result in compliance with ground water cleanup standards in a reasonable restoration time frame.

10.3 Compliance with Applicable State and Federal Laws

The cleanup action complies with applicable state and federal laws, identified in Table 8. Local laws that may be more stringent than specified will govern where applicable.

10.3 Compliance Monitoring

The cleanup action provides for compliance monitoring. Cenex will prepare and submit compliance monitoring plans, including how data is to be obtained, assured, and interpreted, along with a Site Health and Safety Plan (WAC 173-340-810) and a sampling and analysis plan (WAC 173-340-820) in the Remedial Design phase.

10.5 Use of Permanent Solutions to the Maximum Extent Practicable

Removal of chemicals from soil and ground water and subsequent treatment is considered a permanent solution under the MTCA. It is Ecology's opinion that the chosen Alternatives use permanent solutions to the maximum extent practicable in accordance with WAC 173-340-360(5)(e).

10.6 Provide a Reasonable Restoration Time Frame

The proposed cleanup action will limit exposure to hazardous substances from contaminated soil and ground water. Capping, emplacement of treatment systems, and implementation of institutional controls are implementable in a very short time.

Treatment is estimated to take approximately 3 years to reach cleanup levels in soil, and 10 years in ground water. Given Site chemical and physical characteristics, Ecology believes these restoration time frames to be reasonable.

10.7 Public Participation and Community Acceptance

MTCA Regulations require that public concerns regarding the proposed cleanup action be addressed. This DCAP is submitted for public notice and opportunity to comment. The final version of this document will incorporate a response to comments received, and any changes based on Ecology evaluation of those comments.

10.8 Evaluation with Respect to Remedial Action Objectives

Table 9 illustrates which elements of the cleanup action accomplish the remedial action objectives necessary to protect human health and the environment. Ecology believes these actions will be protective by accomplishing these objectives.

11.0 Implementation Schedule

Within 90 days of the effective date of the Consent Decree, Cenex will submit the following document for Ecology review and approval:

An Remedial Design Plan, containing:

- Institutional Control Plan, including draft agreements
- Compliance Monitoring Plan
- Engineering Design Report
- Construction Plans and Specifications
- Operation and Maintenance Plan
- Health and Safety Plan
- Updated Public Participation Plan

Public notice will be provided on these Remedial Plans in accordance with WAC 173-340-600(6)(i). The schedule will indicate implementation of construction and monitoring activities within 90 days of final approval of the Remedial Design Plan. A Cleanup Action Report, summarizing installation of treatment and containment systems and adoption of institutional controls, will be submitted no later than 12 months following acceptance by Ecology of the Remedial Design Plan.

12. References Cited

Environmetrics, 2000: Indoor Air Sampling, Quincy High School, for Cenex Harvest States; report dated August 22, 2000

Ecology, 2000: Responsiveness Summary to the Feasibility Study Public Comment, dated June 16, 2000

Washington Department of Health (WDOH), 2000: Draft Public Health Assessment, Cenex Supply and Marketing Site, Quincy WA;

West Central Environmental Consultants (WCEC), 1997a: Remedial Investigation Report for Cenex Supply and Marketing Rinsate Pond and Fumigant Storage Facility, Quincy, WA; WCEC Project No. 96-1409-90, dated October 23, 1997

West Central Environmental Consultants (WCEC), 1997b: Supplement to the Remedial Investigation Report for Cenex Supply and Marketing Rinsate Pond and Fumigant Storage Facility, Quincy, WA; WCEC Project No. 96-1409-90, dated November 13. 1997

West Central Environmental Consultants (WCEC), 1998: Soil Vapor Sampling Results for the Quincy High School Property, Letter from McCamant (WCEC) to Hares (Ecology), dated January 6, 1998, in Ecology SIT file 3.6.1

West Central Environmental Consultants (WCEC), 2000: Feasibility Study for Cenex Harvest States Fumigant Storage Facility; WCEC Project No. 96-1409-90, dated February, 10, 2000.

West Central Environmental Consultants (WCEC), 2001: December 2000 Quarterly Monitoirng Report, dated January 31, 2001

Figure 1: Site Location (WCEC, 2000)

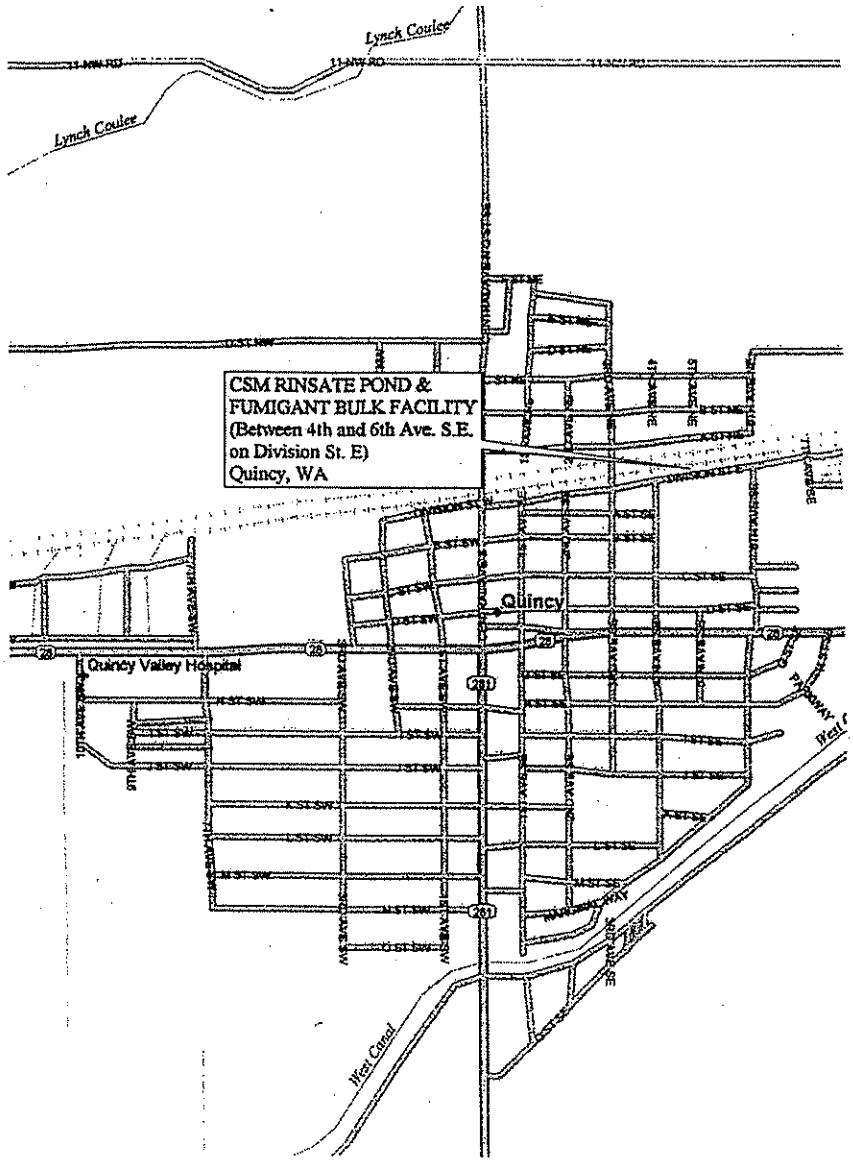


Figure 2: Site Facilities (WCEC, 2000)

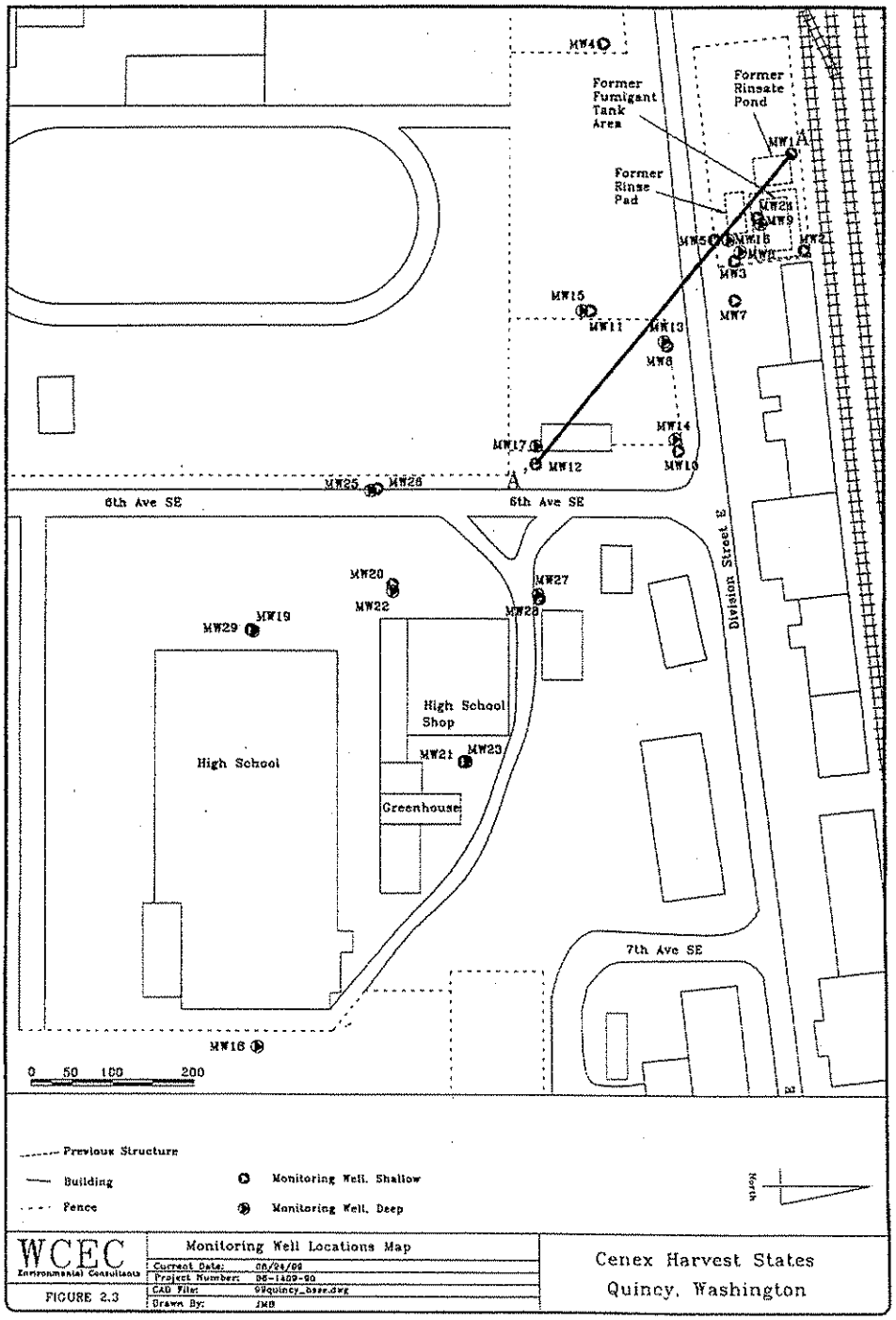


Figure 3: Geologic Cross Section (WCEC, 2000)

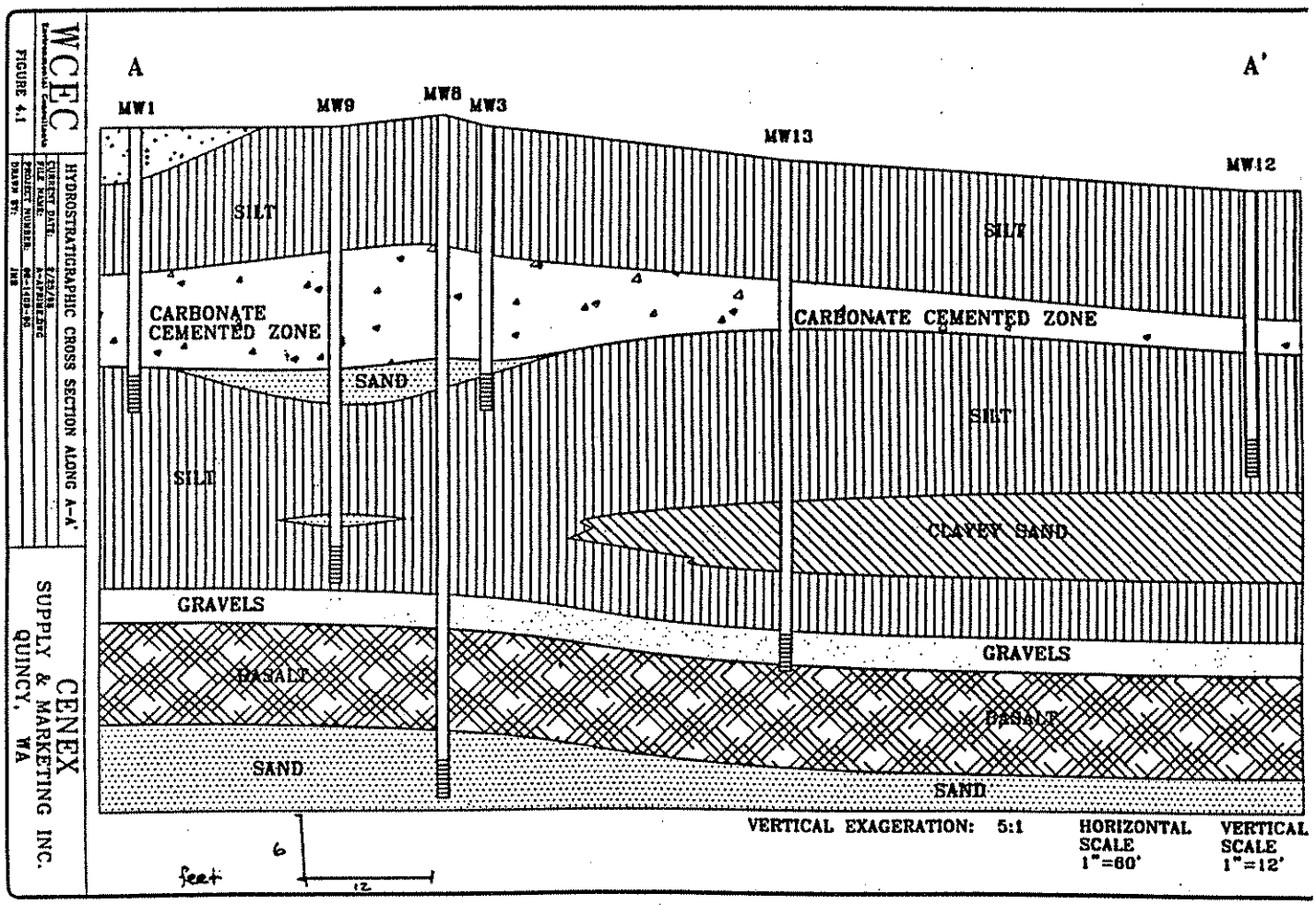


Figure 4: Extent of Site Chemicals (after WCEC, 2000)

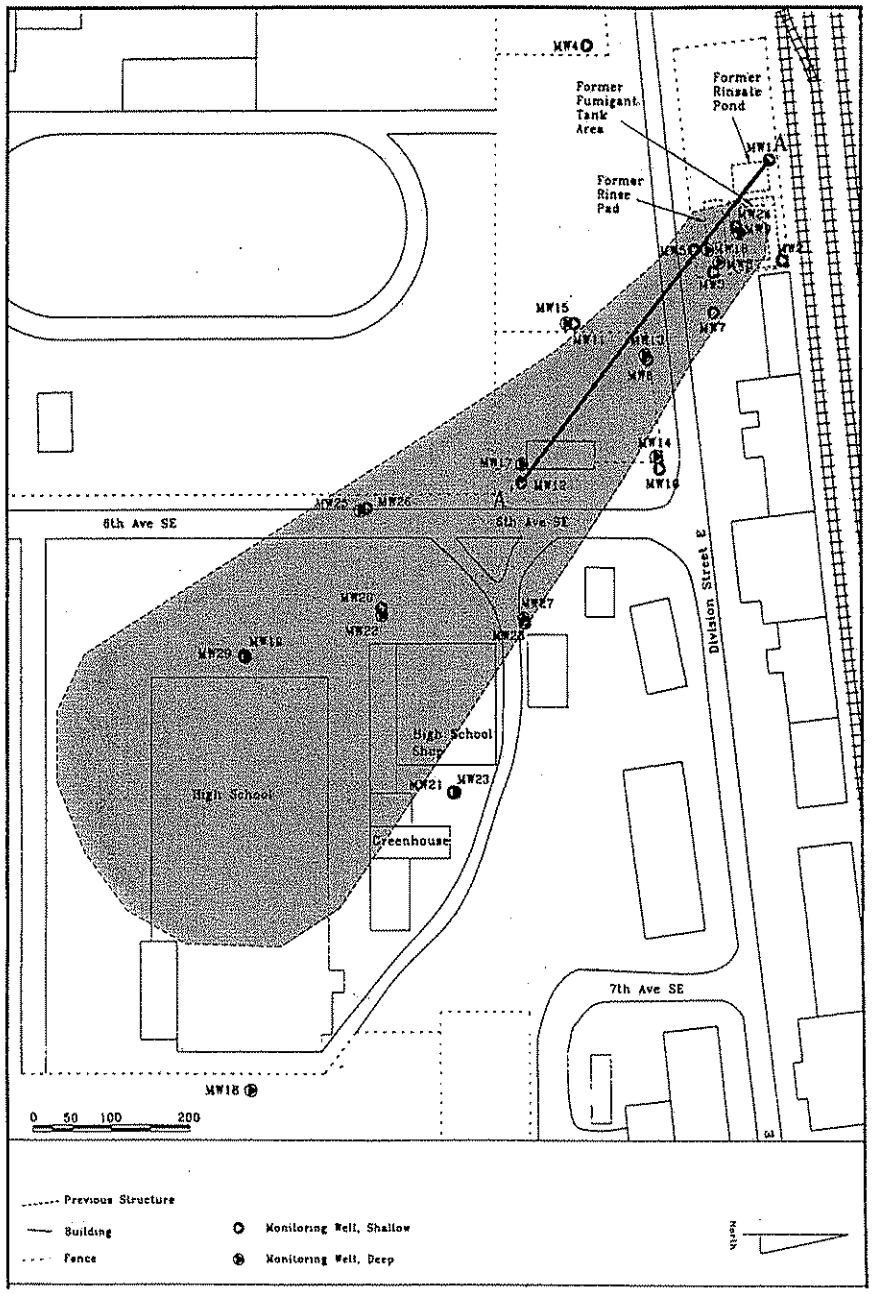


Figure 5: Shallow Ground Water Flow, 6/99 (WCEC, 2000)

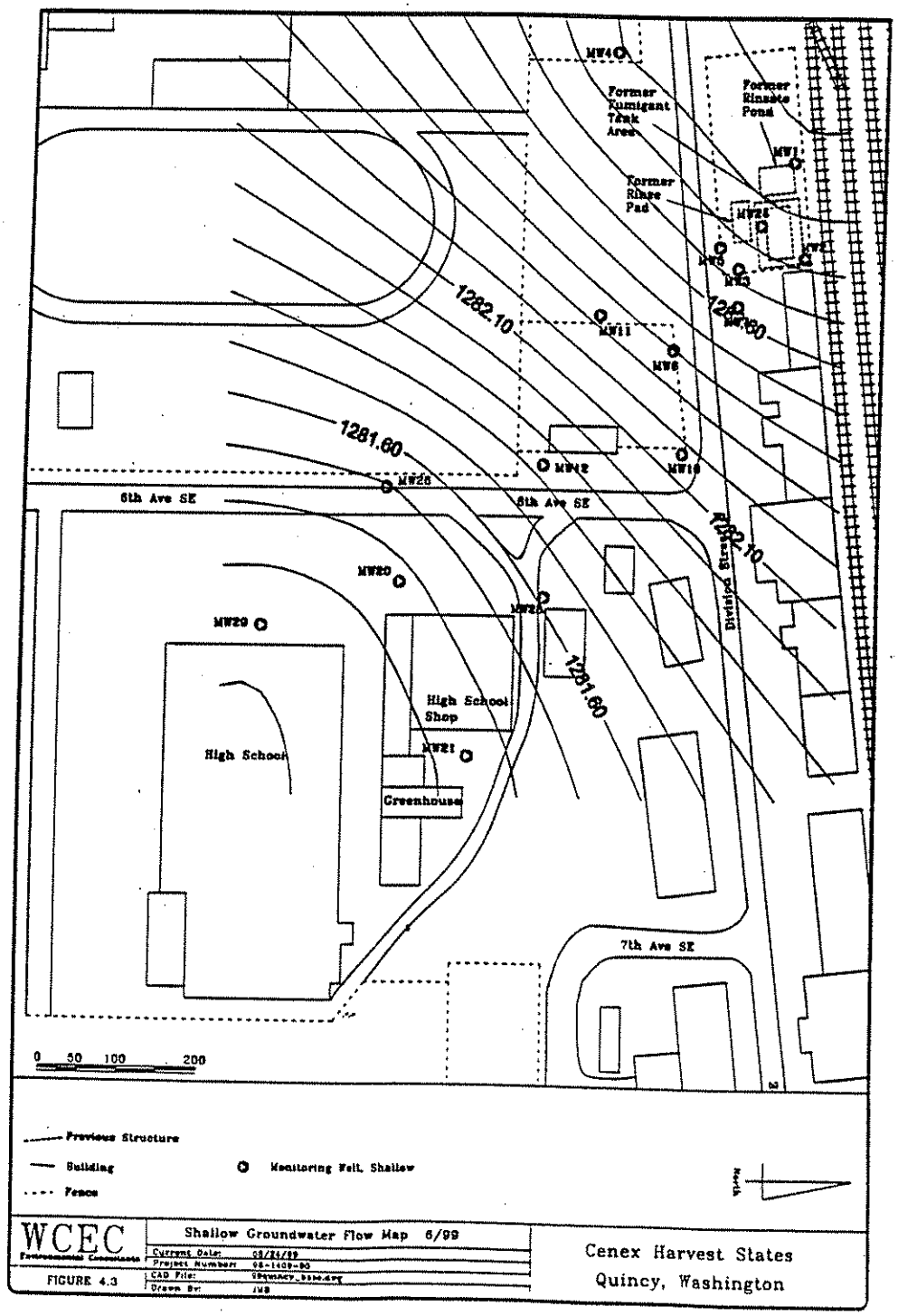
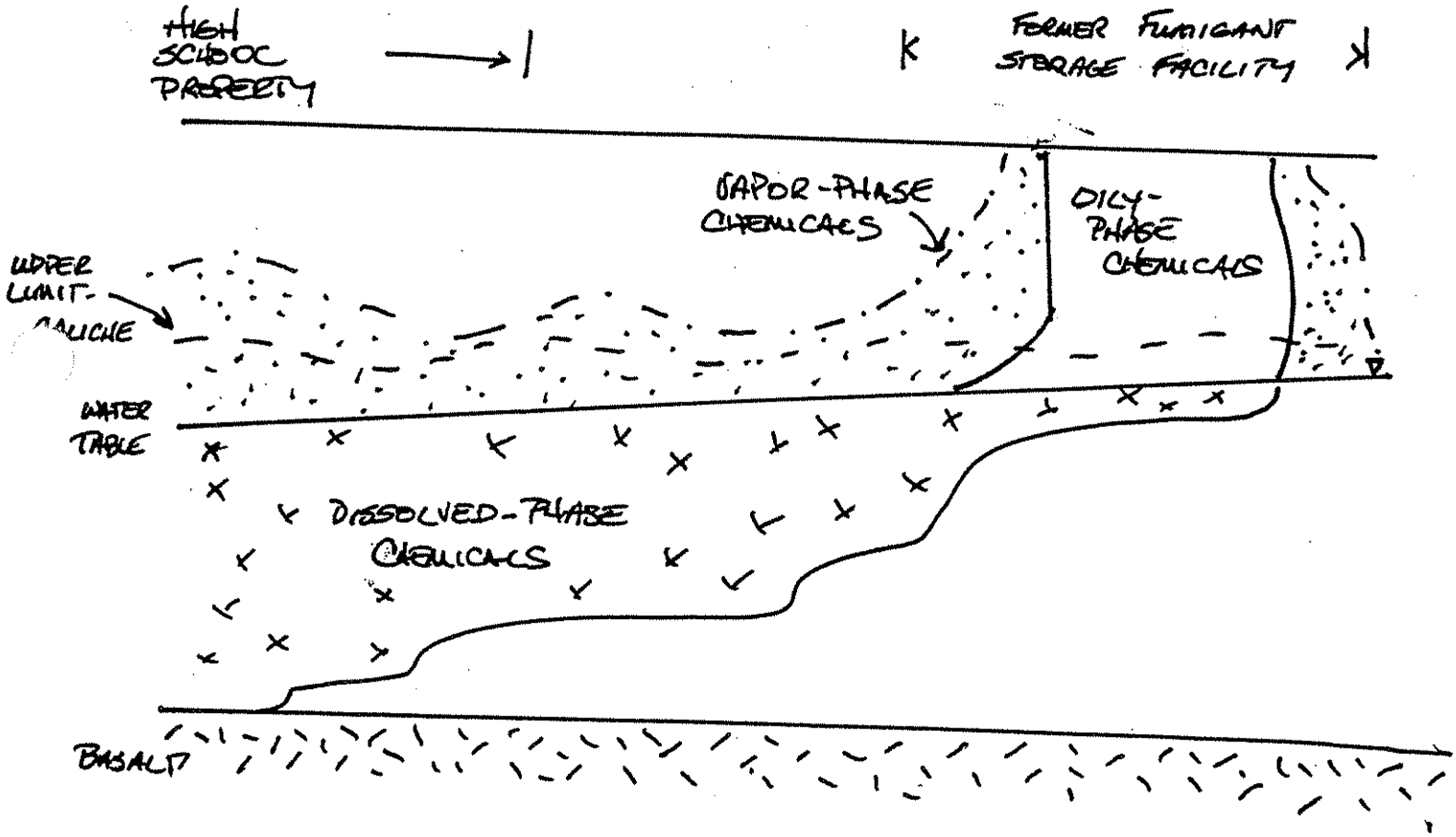


Figure 6: Conceptual Site Model



CROSS SECTION - LOOKING WEST
DIAGRAMMATIC ONLY
NOT TO SCALE

Figure 7: Extent of Chemicals in Soil (WCEC, 2000)

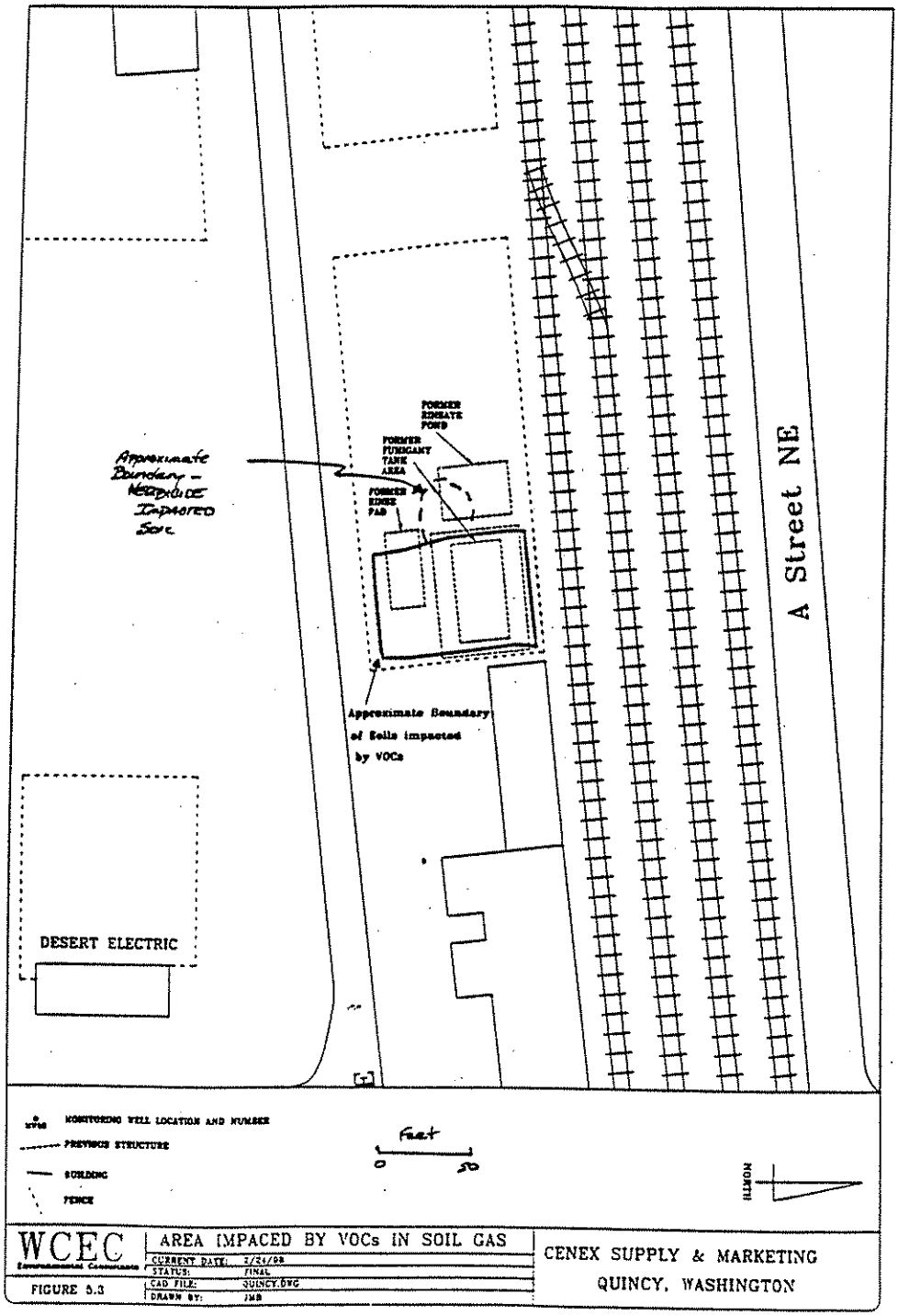


Figure 8: Extent of Chemicals in Soil Gas (after WCEC, 2000)

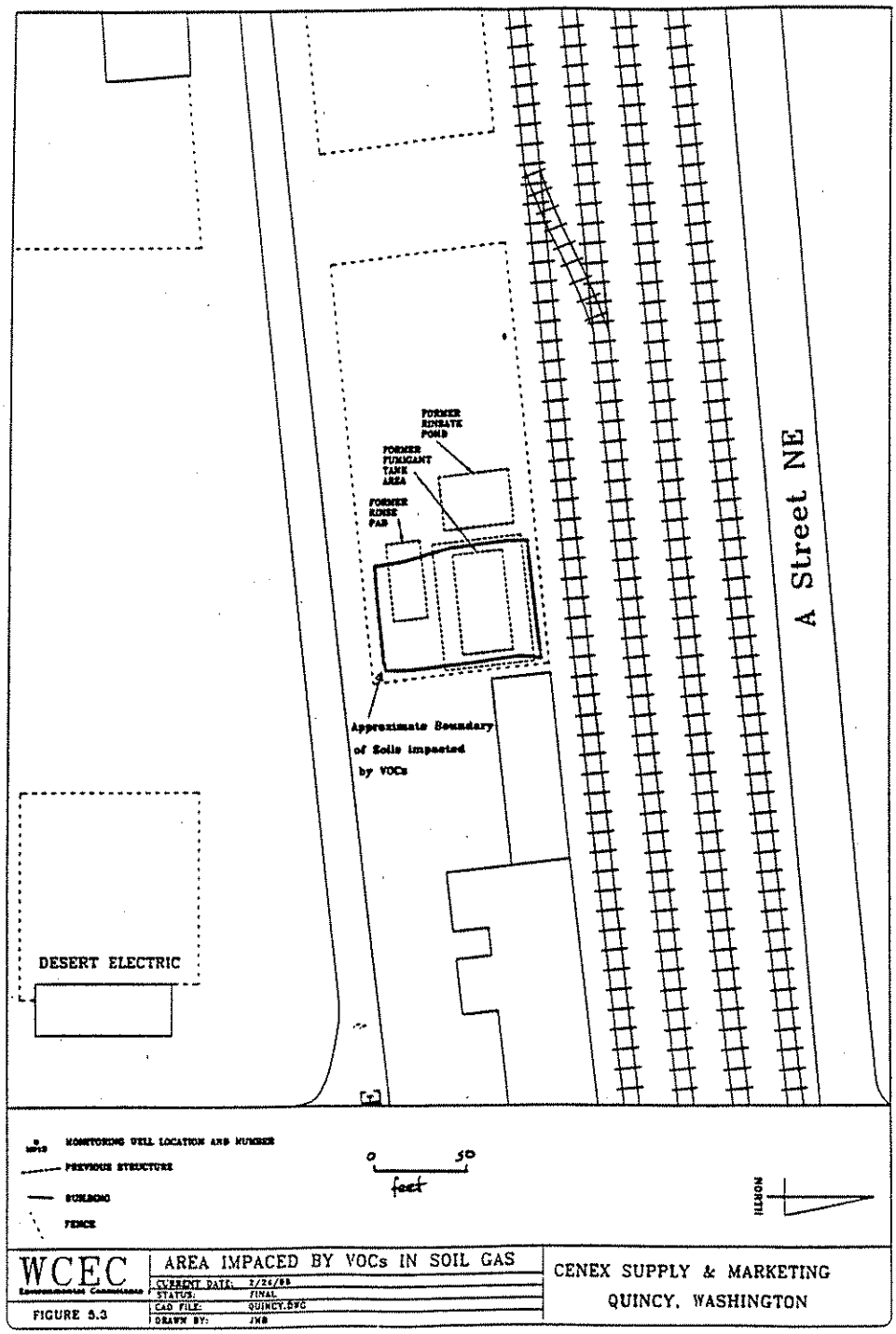


Figure 9: Chemicals in Shallow Ground Water (WCEC, 2000)

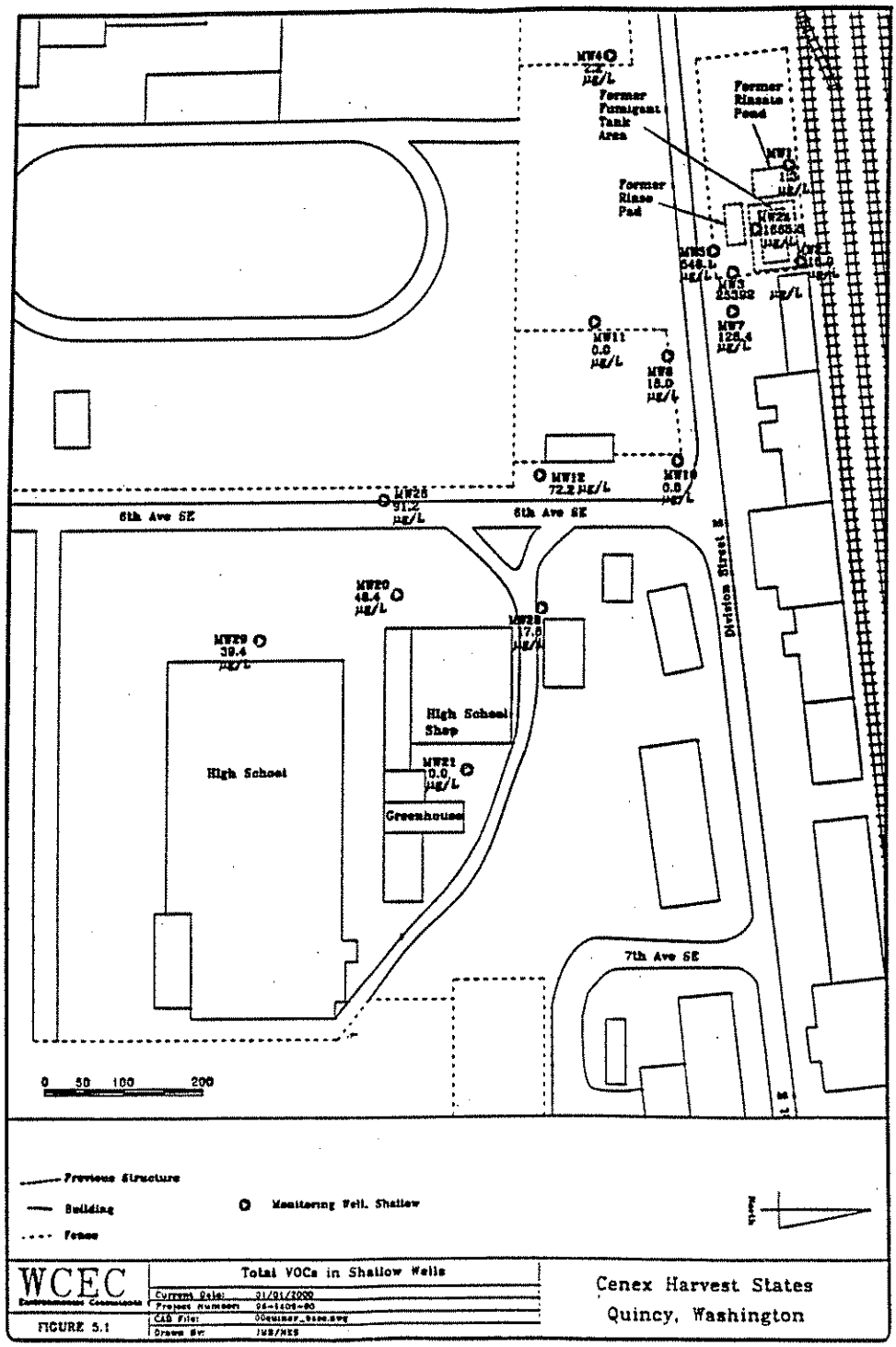


Figure 10: Chemicals in Deep Ground Water (WCEC, 2000)

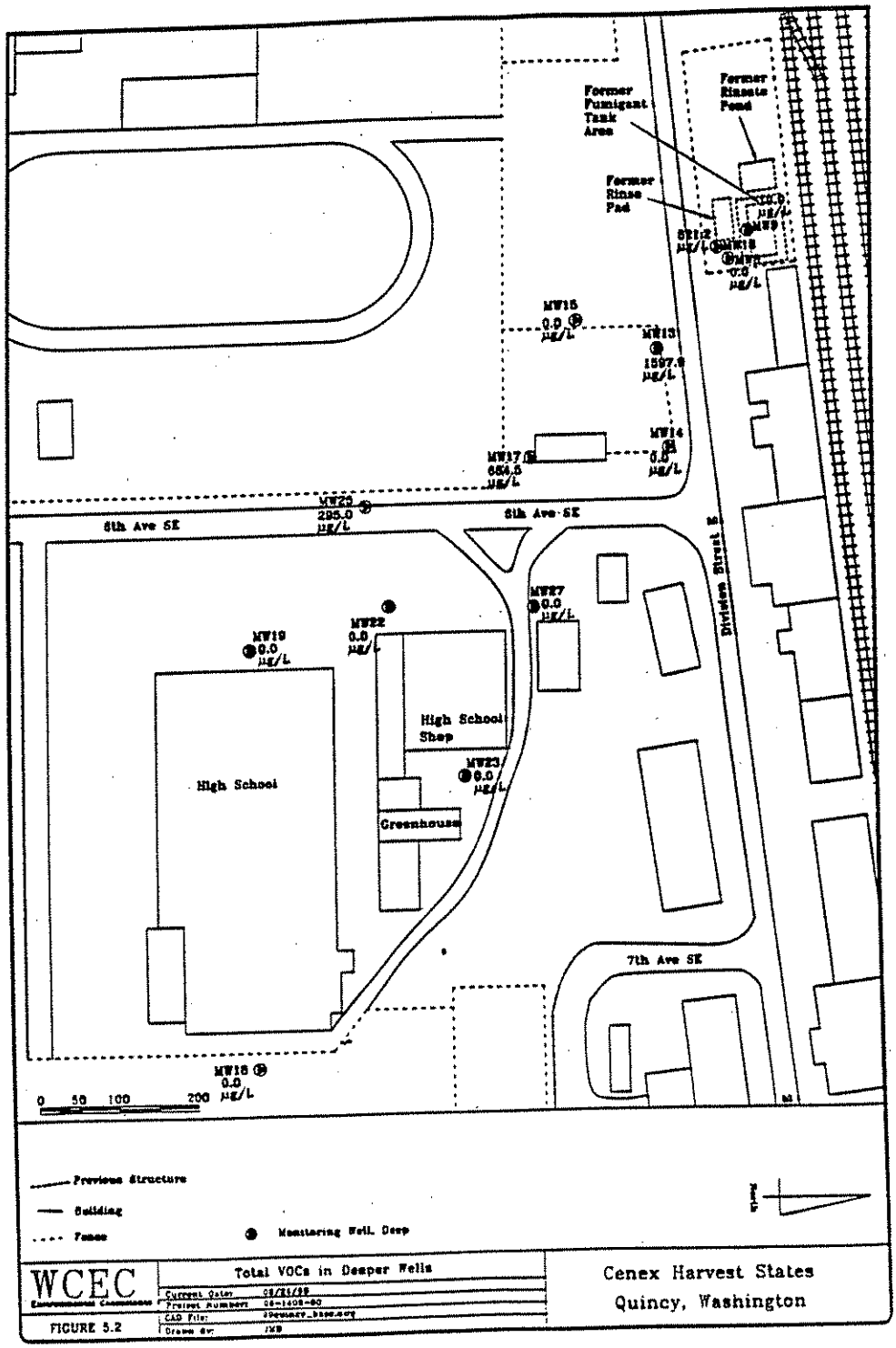


Figure 11: Components of Alternative 2, Institutional Controls

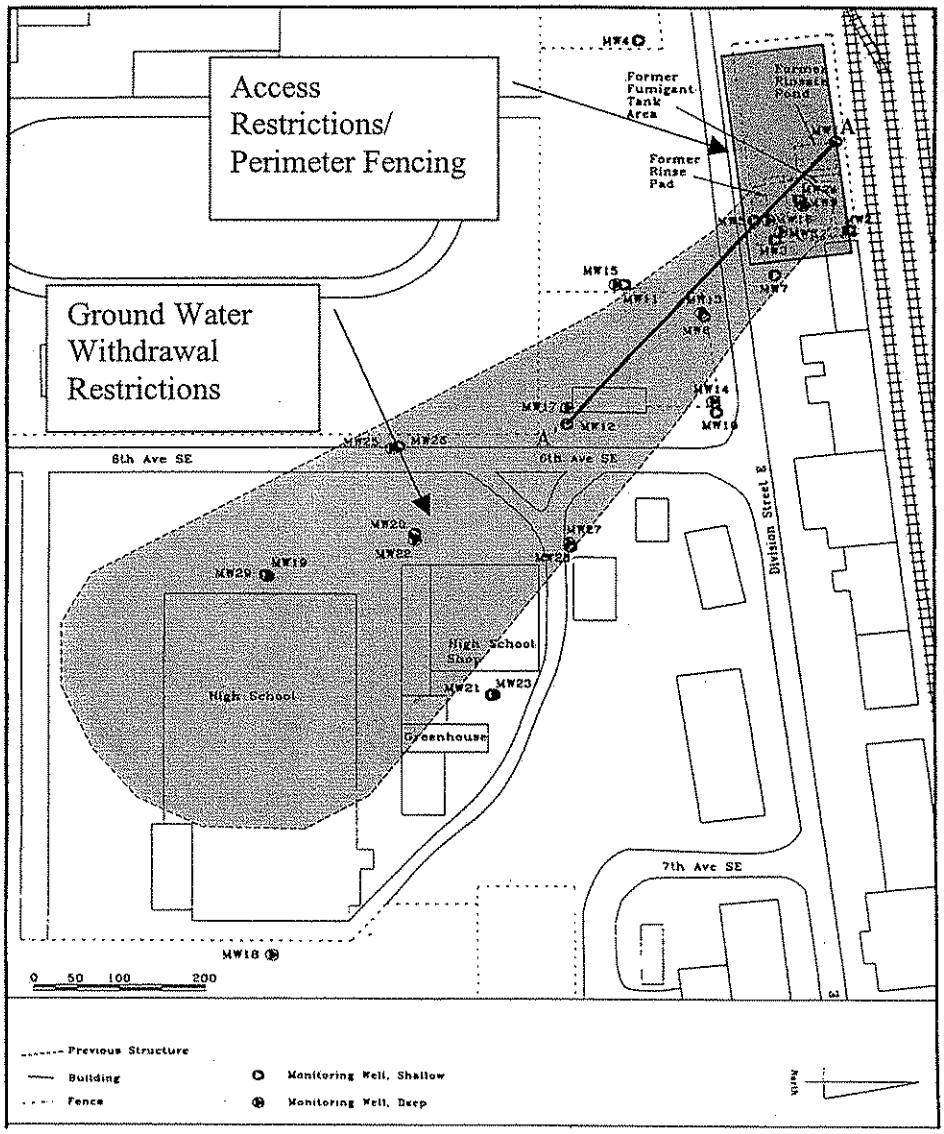


Figure 12: Area to be Capped, Alternative 3 (WCEC, 2000)

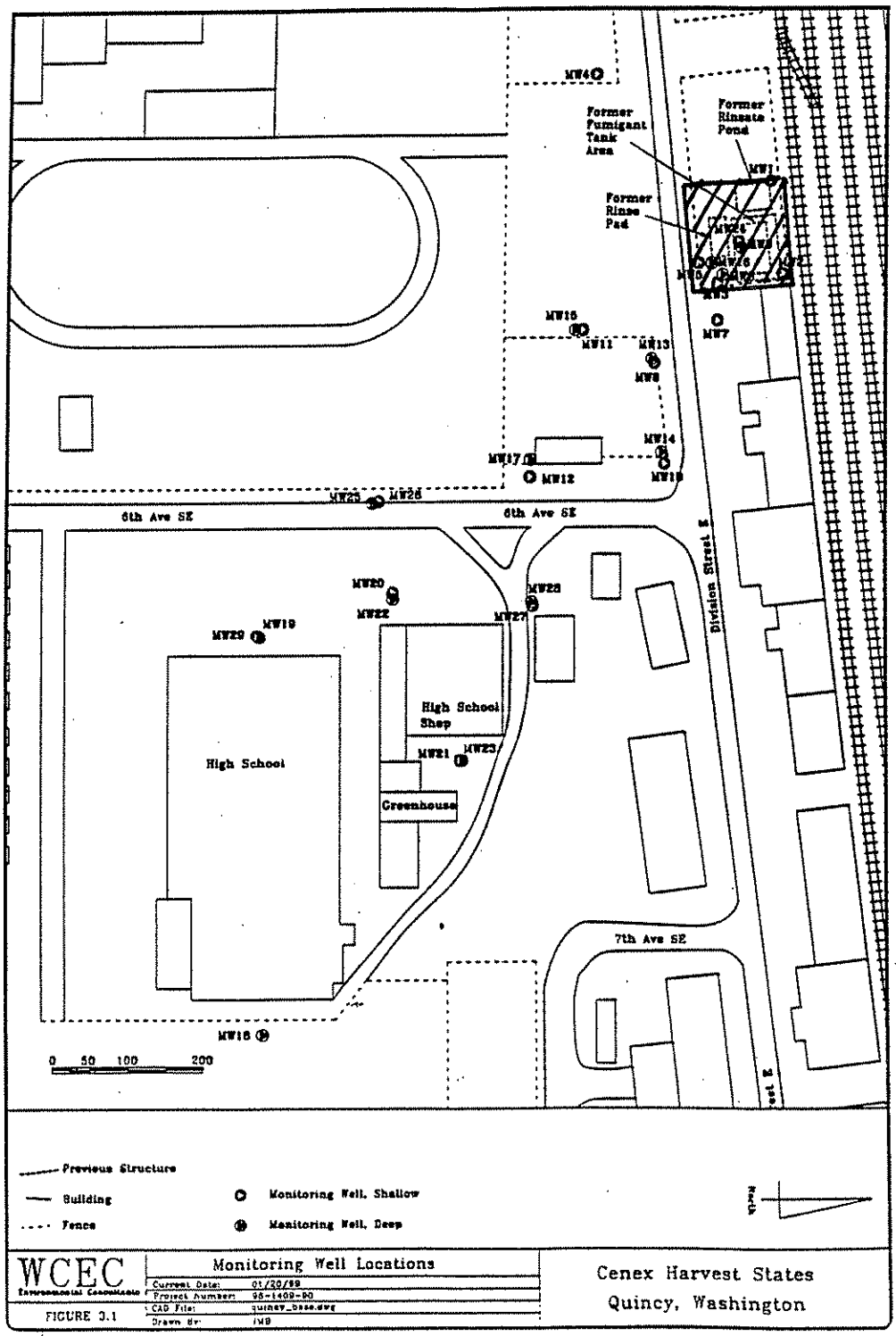


Figure 13: Extent of Soil Vapor Extraction (WCEC, 2000)

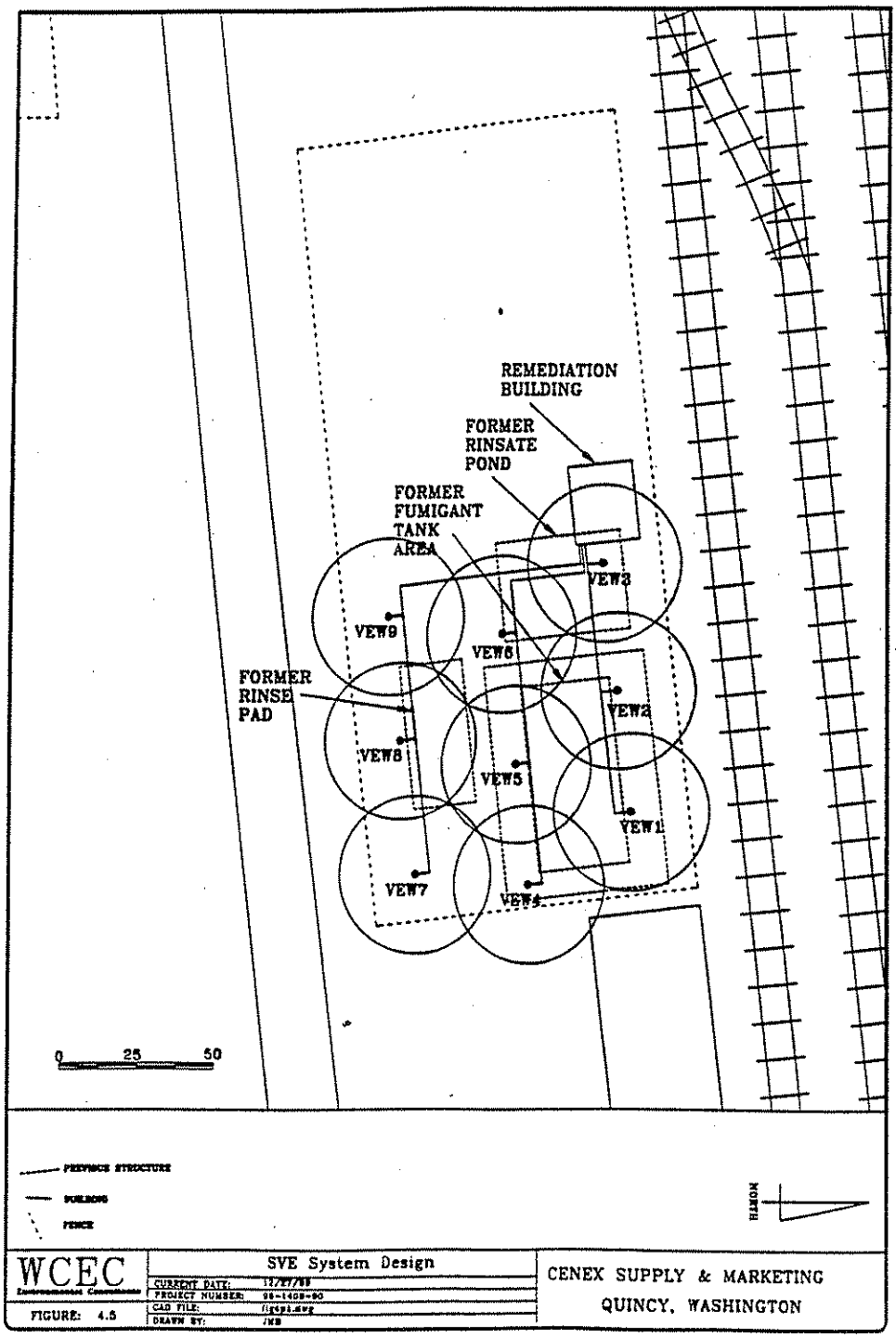


Figure 14: Alternative 6: Microsparge System (WCEC, 2000)

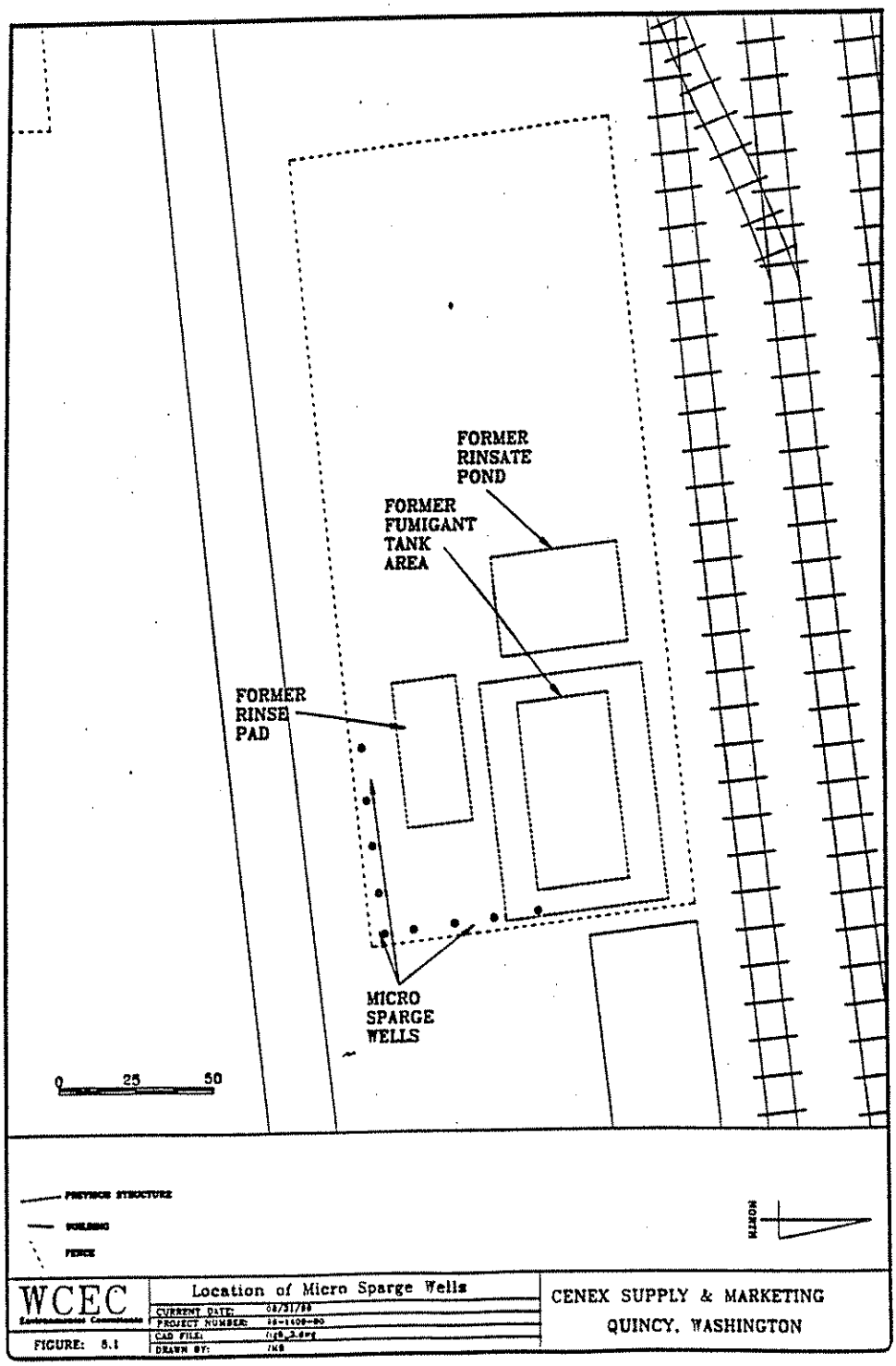


Figure 15: Capture Radius of Alternative 8 (WCEC, 2000)

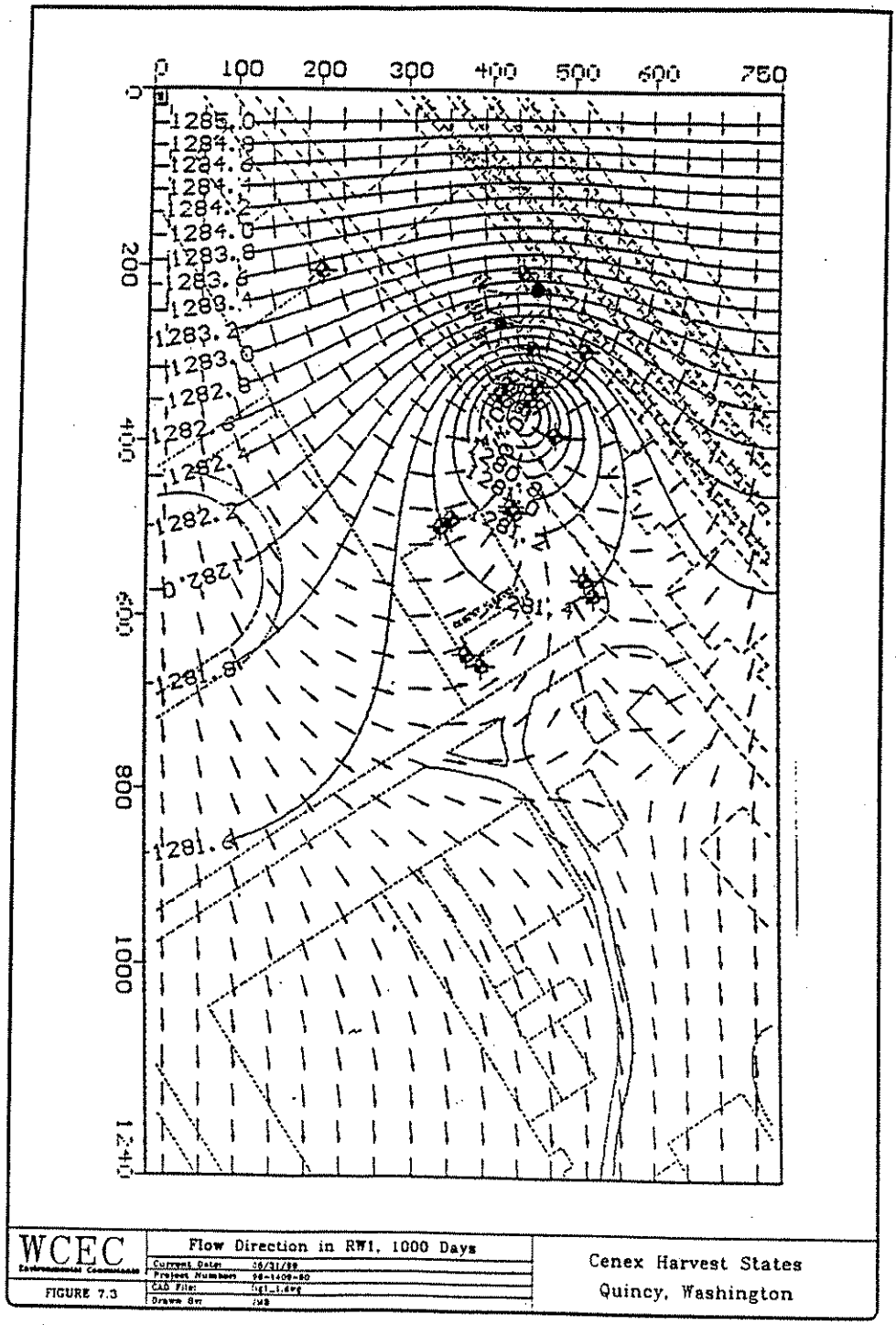


Figure 16: Components of the Selected Remedial Action

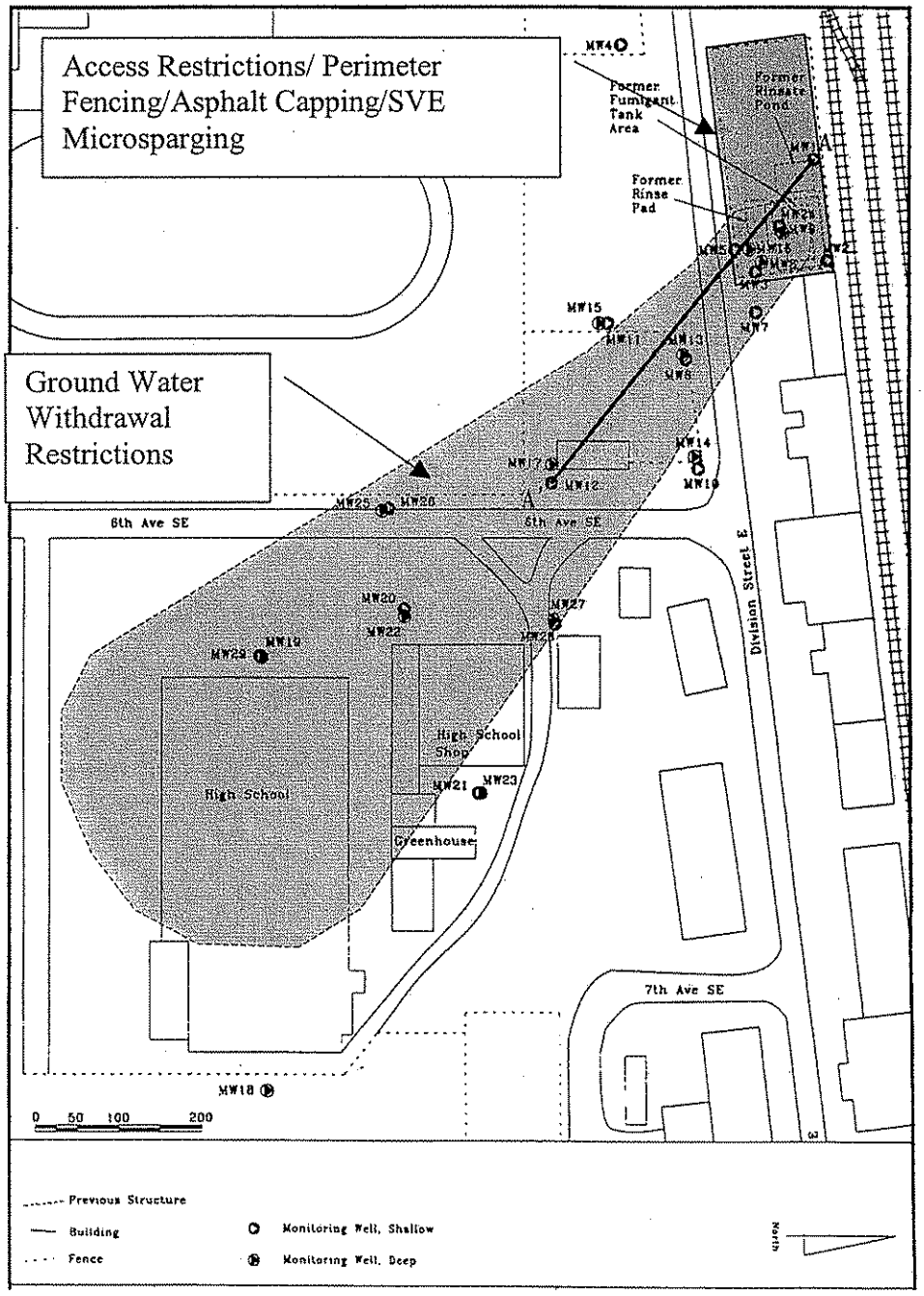


Table 1 -- Index to regulatory requirements of WAC 173-340-360(10)(a)-Contents of the Final Cleanup Action Plan

Requirement	Location
(i) A general description of the proposed cleanup action including compliance monitoring	Section 10
(ii) A brief summary of other alternative cleanup actions evaluated in the state remedial investigation/feasibility study or comparable documents	Section 6
(iii) Site cleanup levels and points of compliance for each hazardous substance and for each media of concern	Section 7
(iv) The schedule for implementation of the cleanup action plan including, if known, restoration time frame	Section 11
(v) Required institutional controls and site restrictions, if any, for the proposed cleanup action	Section 9.3
(vi)Justification for selecting a cleanup action that uses cleanup technologies that have a lower preference than higher representative cleanup technologies listed in WAC 173-340-360(4)(a)	Section 9
(vii) Applicable state and federal laws for the proposed cleanup action, when these are known at this step in the cleanup process	Table 8
(viii) A preliminary determination by the department that the proposed cleanup action will comply with WAC 173-340-360(2) and (3)	Section 10
(ix) Specification of the types, levels, and amounts of hazardous substances remaining on site and the measures that will be utilized to contain them	Section 7, Section 9

Table 2: Chemicals in Ground Water

Chemical	Frequency of Detection	Maximum Concentration (ug/l)	ARAR Standard (ug/l)	ARAR[A]	MTCA Method B Formula Value [b]	Basis
Bromodichloromethane	0.03	2.4			7.06	BCAR
Carbon tetrachloride	**0.04**	**5.6**	**5**	**MCL**	**0.337**	BCAR
Chlorobenzene	0.26	91	100	MCL	160	BNCAR
Chloroform	**0.20**	**73**			**7.17**	BCAR
Chloromethane	**0.04**	**5.8**			**3.37**	BCAR
1,2-Dibromoethane (EDB)	**0.08**	**23**	**0.05**	**MCL**	**5.15E-04**	BCAR
1,1-Dichloroethane	0.06	19			800	BNCAR
1,2-Dichloroethane	**0.18**	**136**	**5**	**MCL**	**0.481**	BCAR
1,1-Dichloroethene	**0.06**	**18**			**0.0729**	BCAR
1,2-Dichloropropane	**0.64**	**35410**	**5**	**MCL**	**0.643**	BCAR
1,3-Dichloropropane	0.47	1650		No Standard		
1,1-Dichloropropene	0.04	3.1		No Standard		
1-3 Dichloropropene	**0.003**	**1.6**			0.243	BCAR
Methylene chloride	0.02	1.7	5	MCL	5.83	BCAR
1,1,2-Trichloroethane	**0.31**	**154**	**5**	**MCL**	0.768	BCAR
1,2,3-Trichloropropane	**0.40**	**1700**			0.00625	BCAR
Vinyl chloride	**0.09**	**7.2**	**2**	**MCL**	0.023	BCAR
Ammonia-N (mg/L)	0.46	471			272000	BNCAR

Sources: Remedial Investigation (WCEC, 1997a)
Remedial Investigation Supplement (WCEC, 1997b)
Feasibility Study (WCEC, 2000)

Frequency of detection = number of detections/number of determinations
All values in micrograms (ug)/L. Values derived from Model Toxics Control Act Cleanup Levels and Risk Calculation Update, dated February, 1996, available at http://www.wa.gov/ecology/tcp/tools/toolmain.html. Basis is as follows:

BNCAR=Values calculated are those estimated to result in no acute or chronic non-carcinogenic effects as in WAC 173-340-720(3)(a)(ii)(A), for current and potential future sources of drinking water.
BCAR=Values calculated which are those for which the upper bound on the estimated excess cancer risk is less than or equal to 1-in-1,000,000 for carcingenic effects as in WAC 173-340-720(3)(a)(ii)(B), for current or potential future sources of drinking water.

ARAR= Applicable or Relevant Requirement of other Federal, State, or Local Law. MCL is Maximum Contaminant Level promulgated under the federal Safe Drinking Water Act.

Table 3: Chemicals in Soil

Chemical Name	Maximum Detected Concentration (mg/kg)	MTCA Method B Formula Value (mg/kg)	***Method***	100 x Groundwater Protective Standard (mg/kg)
Alachlor	**3.4**	12.3	BCAR	**0.108**
Ethalfluralin	478	No standard		
Trifluralin	**138**	**129.8**	BCAR	**1.136**
Atrazine	**8.51**	405	BCAR	**3.98E-2**
Disulfoton	**4.93**	**3.2**	BNCAR	**0.397**
Vernolate	**89.7**	**80**	BNCAR	1.6
Nitrate	2220	128000	BNCAR	N/A
Ammonia	5700	N/A	BNCAR	27200
Chlorobenzene	4.8	1600	BNCAR	16
Dichloropropane;1,2-	**15**	**14.7**	BCAR	**0.064**
Dichloropropane;1,3-	6.8	No Standard		
Trichloroethane;1,1,2-	**0.21**	**17.54**	BCAR	**0.076**
Trichloropropane;1,2,3-	**0.69**	**0.1429**	BCAR	**0.0006**
Beryllium	**0.979**	**0.23**	BCAR	2
Cadmium	0.82	80	BCAR	1.6
Chromium	16.3	8000 Cr(III)/40 Cr (VI)	BCAR	160/8
Copper	19.9	2960	BNCAR	59.2
Lead	11	400	IEUBK	N/A
Nickel	25.3	1600 (soluble salts)	BNCAR	32
Zinc	184	24000	BNCAR	480
Arsenic	5.49	20	A	N/A
Mercury	0.018	1	A	N/A

Sources: Remedial Investigation (WCEC, 1997a)
Remedial Investigation Supplement (WCEC, 1997b)
Feasibility Study (WCEC, 2000)

All values in mg/kg. Values derived from Model Toxics Control Act Cleanup Levels and Risk Calculation Update, dated February, 1996, available at http://www.wa.gov/ecology/tcp/tools/toolmain.html. Values are as follows:

BNCAR=Values calculated are those estimated to result in no acute or chronic non-carcinogenic effects as in WAC 173-340-740(3)(a)(iii)(A), assuming direct contact and ingestion in a residential setting.
BCAR=Values calculated which are those for which the upper bound on the estimated excess cancer risk is less than or equal to 1-in-1,000,000 for carcingenic effects as in WAC 173-340-740(3)(a)(iii)(B), assuming direct contact and ingestion in a residential setting.

A=Tabulated values, protective of all beneficial uses and cross-media impacts in WAC 173-340-740(2)
IEUBK=Integrated Exposure Uptake Biokinetic Model screening value for lead in soil at residential properties, USEPA/OSWER Directive 9355.4-12, modified by OSWER Directive 9200.4-27P

Table 4: Cleanup Levels for the Cenex/Quincy Site

Chemical	Medium	Method B Formula Value	PQL[(a)]	EPA Method	Cleanup Level	**Risk**	**Basis**
Chloroform	Ground Water	7.2 ug/l	1 ug/l	8260	7.2 ug/l	$1x10^{-6}$	BCAR
1,2-Dibromoethane (EDB)	Ground Water	5.15E-04 ug/l	1 ug/l	8260	1 ug/l	$1x10^{-6}$	PQL
1,2-Dichloroethane	Ground Water	0.481 ug/l	1 ug/l	8260	1 ug/l	$1x10^{-6}$	PQL
1,2-Dichloropropane	Ground Water	0.643 ug/l	1 ug/l	8260	1 ug/l	$1x10^{-6}$	PQL
	Soil	0.064 mg/kg	.0.005 mg/kg	8260	0.064 mg/kg	4×10^{-9}	BCAR
1,1,2-Trichloroethane	Ground Water	0.768 ug/l	1 ug/l	8260	1 ug/l	$1x10^{-6}$	BCAR
	Soil	0.076 mg/kg	0.005 mg/kg	8260	0.076 mg/kg	4×10^{-9}	BCAR
1,2,3-Trichloropropane	Ground Water	0.00625 ug/l	1 ug/l	8260	1 ug/l	$1x10^{-6}$	PQL
	Soil	0.0006 mg/kg	0.005 mg/kg	8260	0.005 mg/kg	$1.25 x10^{-9}$	PQL
Vinyl Chloride	Ground Water	0.023 ug/l	1 ug/l	8260	1 ug/l	$1x10^{-6}$	PQL

(a): Sources: Ecology, Manchester Environmental Laboratory Lab Users Manual, February, 1994, as updated; USEPA SW-846 Method 8260, Volatile Organic Compound Analysis, and Personal Communication Manchester Laboratory, 2000. Note that PQL's change with increased analytical capability.

Total site risk sums to 7×10^{-6} total site cancer risk.

Table 5: Comparison of Proposed Cleanup Alternatives with Threshold Criteria

Cleanup Action	Protect Human Health and the Environment?	Comply with Cleanup Standards?	Comply with Applicable State and Federal Laws?	**Provide for Compliance Monitoring?**
Alternative 1: No Action	No	No	No	No
Alternative2: Institutional Controls and Monitoring of Natural Degradation	No	Yes	Yes	Yes
Alternative 3: Asphalt Capping of Site Soils	Yes	Yes	Yes	Yes
Alternative 4: Excavation of Impacted Soils	Yes	Yes	Yes	Yes
Alternative 5: Soil Vapor Extraction of Soils above the Caliche	Yes	Yes	Yes	Yes
Alternative 6: In-Situ Air Stripping (Micro-Sparge) of Ground Water	Yes	Yes	Yes	Yes
Alternative 7: Oxygenation of Ground Water using Air Sparge	Yes	Yes	Yes	Yes
Alternative 8: Ground Water Containment and Treatment	Yes	Yes	Yes	Yes
Alternative 9: Aquifer De-Watering and Soil Vapor Extraction	Yes	Yes	Yes	Yes

Table 6: Comparison of Cleanup Alternatives with Permanent Solution Criteria

[WAC 173-340-360(5)]

Cleanup Action	Overall Protectiveness	Long-Term Effectiveness	Short-Term Effectiveness	Reduction in Toxicity, Mobility, and Volume	Implementability	**Cost**
Alternative 3: Asphalt Capping of Site Soils	4	5	6	6	6	6
Alternative 4: Excavation of Impacted Soils	5	7	5	6	5	3
Alternative 5: Soil Vapor Extraction of Soils above the Caliche	6	6	6	7	6	6
Alternative 6: In-Situ Air Stripping (Micro-Sparge) of Ground Water	7	5	6	6	6	7
Alternative 7: Oxygenation of Ground Water using Air Sparge	6	5	6	6	6	7
Alternative 8: Ground Water Containment and Treatment	4	4	5	7	4	4
Alternative 9: Aquifer De-Watering and Soil Vapor Extraction	5	4	5	7	4	4

Table 7: Remedial Action Costs

Remedial Action	*Estimated Cost*
Alternative 3: Asphalt Capping of Site Soils	39,000
Alternative 4: Excavation of Impacted Soils	990,000
Alternative 5: Soil Vapor Extraction of Soils above the Caliche	56,000
Alternative 6: In-Situ Air Stripping (Micro-Sparge) of Ground Water	114,000
Alternative 7: Oxygenation of Ground Water using Air Sparge	42,000
Alternative 8: Ground Water Containment and Treatment	347,000 (assumes 20 gpm pumping rate)
Alternative 9: Aquifer De-Watering and Soil Vapor Extraction/Microsparge	382,000 (assumes 10 gpm pumping rate)

Source: Tables 8.3-8.9, Feasibility Study (WCEC,2000). Costs are presumed accurate within a range of –30%/+50%, in accordance with EPA Feasiblity Study Guidance. Costs do not include costs of monitoring or acquiring institutional controls which are estimated at an annual cost togetther of approximately $110,000. (Table 9.2, WCEC, 2000)

Table 8- Federal and State Laws and Regulations Potentially Applicable to the Cleanup Action

Action	Citation	Comment
Cleanup Action Construction	29 CFR 1910	Occupational Safety and Health Act
	Ch. 43.21 RCW	State Environmental Policy Act
	Ch. 296--155 WAC	Safety Standards for Construction Work
	Ch. 173-160 WAC	Minimum Standards for Construction and Maintenance of Wells
	Ch. 173-340 WAC	Model Toxics Control Act Cleanup Regulation
Cleanup Standards	Ch. 70.105D RCW	Model Toxics Control Act and Cleanup Regulation
Soil Remediation	40 CFR part 50	National Primary and Secondary Air Quality Standards
	Ch. 70.95 RCW, Ch. 173-351 WAC, Ch. 173-304 WAC	Washington State Solid Waste Management Law and Regulations
	Ch. 173-400 WAC	Washington State General Requirements for Air Pollution Sources
	Ch. 173-403 WAC	Implementation of Regulations for Air Contaminant Sources
	Ch. 174-50 WAC	Accreditation of Environmental Laboratories
	Ch. 173-216 WAC	Washington State Waste Discharge Permit Program

Table 9: Comparison of Remedial Action Objectives and Remedial Actions

Remedial Action Objective	Remedial Action Element
Eliminate direct contact with soils bearing chemicals above cleanup levels.	• Asphalt Capping of Site Soils • Soil Vapor Extraction of Soils above the Caliche
Eliminate direct contact with and ingestion of ground water containing chemicals of concern above cleanup levels	• Institutional Controls and Monitoring
Eliminate transfer of chemicals from soils to ground water to protect beneficial uses	• Soil Vapor Extraction of Soils above the Caliche • Oxygenation of Ground Water by Air Sparging • In-Situ Air Stripping and Microsparge
Restore beneficial uses of ground water at the point of compliance	• Soil Vapor Extraction of Soils above the Caliche • Oxygenation of Ground Water by Air Sparging • In-Situ Air Stripping and Microsparge
Evaluate, and if necessary eliminate, exposure to chemical-bearing soil gas	• Air Monitoring Evaluation of Quincy High School

Exhibit C
Scope of Work and Schedule
For
Cleanup Action

Cenex/Quincy Site

This Scope of Work will be used by Cenex Harvest States Cooperatives (Cenex) and their consultants to develop work plans for the Cenex/Quincy Site. Cenex shall furnish all personnel, materials and services necessary for, or incidental to, preparing plans and reports and implementing the Cleanup Action. Plans and submittals shall be prepared in accordance with Chapter 173-340-840 of the Washington Administrative Code.

Submittals:

A. Remedial Action Plan (RAP)

The RAP shall contain the following elements:

1. Summary Remedial Action Work Plan
2. Institutional Controls Plan
3. Soil Treatment and Containment Plan
4. Ground Water Treatment Plan
5. Compliance Monitoring Plan, including:
   A: Ground Water Monitoring, Sampling and Analysis Plan
   B: Air Quality Sampling and Analysis Plan
   C: Soil Compliance Monitoring Plan
6. Data Management Plan
7. Investigative and Project Waste Management Plan
8. Health and Safety Plan

1. The Summary Remedial Action Work Plan shall contain:

- Goals of the cleanup action, and performance requirements;
- General information on the facility, and a summary of RI/FS and Interim Action documents, updated to reflect current conditions;
- Identification of site property owners, principal persons and responsibilities;
- Characteristics, location, and estimated quantity of material to be treated;
- Schedule of deliverables.

2. Institutional Controls Plan

Institutional controls limiting site ground water use and restricting land uses within the facility are required as part of the Cleanup Action Plan. The purpose of institutional

controls are (WAC 173-340-440) to limit or prohibit activities that may interfere with the cleanup action, prohibit inappropriate land uses; and prohibit domestic use of site ground water. The Institutional controls plan shall include copies of proposed institutional control documents, including the regulatory requirements of WAC 173-340-440.

3. Soil Treatment and Containment Plan

The Soil Treatment and Containment Plan shall include:

a. A description and conceptual design of soil treatment and containment features;
b. Engineering justification for design and operation parameters, including general material specifications, design criteria, assumptions and calculations; expected treatment efficiencies; pilot or treatability data, results from similar operations and interim actions, and literature evidence;
c. Construction schedules, including identification of applicable or relevant and appropriate federal state and local requirements;
d. Health and safety feature design, including monitoring devices;
e. Facility-specific characteristics which may affect design, construction, or operation of the cleanup action;
f. Detailed plans and blueprints of equipment and site conditions.

4. Ground Water Treatment Plan

The Ground Water Treatment Plan shall include:

a. A description and conceptual design of ground water treatment features;
b. Engineering justification for design and operation parameters, including general material specifications, design criteria, assumptions and calculations; expected treatment efficiencies; pilot or treatability data, results from similar operations and interim actions, and literature evidence;
c. Construction schedules, including identification of applicable or relevant and appropriate federal state and local requirements;
d. Health and safety feature design, including monitoring devices;
e. Facility-specific characteristics which may affect design, construction, or operation of the cleanup action;
f. Detailed plans and blueprints of equipment and site conditions.

5. Compliance Monitoring Plan

Compliance monitoring is required for all cleanup actions. Compliance monitoring consists of protection monitoring, performance monitoring, and confirmational monitoring [WAC 173-340-410]. Protection monitoring confirms that human health and the environment are protected during construction and operation and maintenance of the cleanup action. Performance monitoring confirms the cleanup action has attained

cleanup standards and any other required performance standard. Confirmational monitoring confirms the long-term effectiveness of the cleanup action after cleanup standards are maintained.

Separate plans are suggested for air, soils and ground water sampling efforts, as objectives differ. Soil sampling is expected to be confirmational monitoring, while ground water efforts should be considered as performance monitoring. Air monitoring during soil treatment is for protection monitoring.

a. Soils Sampling and Analysis Plan

i. Objectives;
ii. Schedules and task assignments;
iii. Access;
iv. Samples, including:

(a) Sampling methods;
(b) Locations and ID numbers (map);
(c) List order of samples collections;
(d) Sample objectives;
(1) samples to determine nature and extent of contamination; and
(2) samples to determine performance of remedial actions.
(e) QA/QC samples;
(f) Shipping and handling arrangements;
(g) Split sampling opportunity; and
(h) Analytical parameters, including:
(1) justifications for choice of analyses;
(2) laboratory and analytical method identification, including detection limits;
(3) sample containers preservation and holding times; and
(4) laboratory-generated QA/QC samples.
(i). List of supplies and equipment

b. Ground Water Sampling and Analysis Plan

i. Objectives;
ii. Schedules and task assignments;
iii. Access;
iv. Samples, including:
(a) Sampling methods and equipment;
(b) Locations and ID numbers (map);
(c) List order of sample collections;
(d) Sample objectives;
(e) QA/QC samples;

(f) Shipping and handling arrangements;
(g) Split sampling opportunity; and
(h) Analytical parameters, including:

(1) justifications for choice of analyses;
(2) laboratory and analytical method identification, including detection limits;
(3) sample containers preservation and holding times; and
(4) laboratory-generated QA/QC samples.

(i) List of supplies and equipment

c. Air Sampling and Analysis Plan

i. Sample locations
ii. Sampling procedures and methods of analysis
iii. List of parameters to be measured
iv. Action levels triggering additional sampling or mitigative measures

d. Quality Assurance Project Plans

Quality Assurance Project Plans shall address, at a minimum, the following issues for all media.

i. Field QA/QC methods:
ii. Standard operating procedure for field sampling methods (reference SOP and describe briefly);
iii. Field documentation methods;
iv. Frequency of QA/QC samples:
    (a) duplicates;
    (b) rinsate;
    (c) blank.
v. Field instrument calibration;

(a). Chain of custody procedures;

e. Decontamination procedures, including:

i. entry and exit controls;
ii. disposal of wastes from sampling effort; and
iii. equipment and personnel decontamination.

f. Laboratory QA/QC program:

6. Data Management Plan

A procedure for ground water, air, and soil data analysis and evaluation must be established to demonstrate compliance with site cleanup levels. WAC 173-340-410 refers to acceptable statistical procedures in all media. Compliance with ground water cleanup levels shall be demonstrated at each monitoring well at and beyond the point of compliance. The data analysis and evaluation plan shall include:

a. A summary of indicator parameters and cleanup levels;
b. A summary of action levels, if any;
c. Procedures for measurements below the detection limit or PQL;
d. Statistical parameters and methods;
e. Schedule for formal data reviews; and
f. Electronic format for data submittal.

7. Health and Safety Plan

A Safety and Health Plan is required for all remedial actions (WAC 173-340-820). The Plan must comply with the requirements of the Occupational Safety and Health Act of 1970 (29 U.S.C. Sec. 65 et. seq.) and the Washington Industrial Safety and Health Act (Ch. 49.17 RCW). The Safety and Health Plan shall include:

a. Levels of Protection
b. Hazard Evaluation
c. Waste Characteristics
d. Special Site considerations
e. Emergency plan information.

Although a Safety and Health Plan is required and must be submitted, Ecology approval of the plan is not necessary.

8. Investigative and Project Waste Management Plan

Plans for management of materials generated as the result of surface or subsurface investigative activities, device installation, or other procedures shall be submitted. They shall address:

a. Methods and proposed location of storage or staging of materials awaiting treatment;
b. Well purge water handling, sampling, analysis, and disposal;
c. Storage, handling, sampling, analysis and disposal of soils generated as a result of soil sampling and/or well installation;
d. Storage, handling, and disposal of materials generated as a result of or incidental to remedial action.

All management of wastes generated will be done in accordance with applicable local, state and federal law and regulation.

B. Cleanup Action Report

At the completion of implementation of construction of activities in the Remedial Action Plan, in accordance with the schedule, a report is required. The report shall be prepared by the engineer responsible for the supervision of the construction and shall include:

1. As-built drawings of the facility
2. A report documenting all aspects of facility construction
3. Compliance monitoring data gathered to date
4. A statement from the engineer, based upon testing results and inspections, as to whether the cleanup action was performed in substantial compliance with the plans and specifications and related documents
5. Certified copies of property deeds, documenting institutional controls in place;
6. Long term maintenance plan

C. Remedial Action Performance and Ground Water Compliance Monitoring Report

To track performance of remedial action and in preparation for 5 year review, reports outlining performance and ground water monitoring activities shall be prepared. One report including all gathered data shall be prepared every 3 months. Each report shall be incorporated into an annual monitoring summary. Fourth quarter results may be incorporated into the annual summary.

Schedule

Baseline Date: Date of Ecology Acceptance of Decree/Draft Cleanup Action Plan

Task A
Draft Remedial Action Plan (RAP) including:
1. Summary Remedial Action Work Plan
2. Institutional Controls Plan
3. Soil Treatment and Containment Plan
4. Ground Water Treatment Plan
5. Compliance Monitoring Plan, including:
6. Data Management Plan
7. Investigative and Project Waste Management Plan
8. Health and Safety Plan

Due: 90 days following Baseline Date

Final RAP Work Plan	30 days following receipt of Ecology Comments following 30 Day Public Notice Period

Task B:

Draft Cleanup Action Report	180 Days following submittal of final RAP Work Plan
Final Cleanup Action Report	15 days following receipt of Ecology Comments on Draft

Task C:
Remedial Action Performance and Ground Water Compliance Monitoring Reports:

December Sampling: due first business day following March 1 of following calendar year

March Sampling: due first business day following June 1 of calendar year

June Sampling: due first business day following September 1 of calendar year

September sampling and annual report: due first business day following December 1 of calendar year.

Five Year Review:	60 months following acceptance of Final Remedial Action Report

EXHIBIT D

PUBLIC PARTICIPATION PLAN

CENEX SUPPLY AND MARKETING FACILITY - QUINCY

AMENDED
PUBLIC PARTICIPATION PLAN

PROPOSED CONSENT DECREE AND CLEANUP ACTION PLAN

PREPARED BY:

WASHINGTON STATE DEPARTMENT OF ECOLOGY

DECEMBER 2000

INTRODUCTION

OVERVIEW OF PUBLIC PARTICIPATION PLAN

The Public Participation Plan (Plan) has been developed by the Washington Department of Ecology (Ecology) for the Cenex Supply and Marketing Facility-Quincy (Site) located at 300 Division Street between 4th Avenue SE and 6th Avenue SE in the City of Quincy, Grant County, Washington. The cleanup at this Site focuses on removal of fumigant residues in subsurface soil, mainly 1,2-Dichloropropane. A narrow plume of contamination in ground water extends toward the southeast from the Site and contains similar chemicals which are being remediated.

The Plan complies with the Washington State Model Toxics Control Act (MTCA) regulations (Chapter 173-340-600 WAC) and outlines proposed public participation from the beginning stages of cleanup through the final stages. The Plan will be reviewed during each stage and may be amended if necessary. Ecology will determine final approval of the Plan as well as any amendments.

The purpose of the Plan is to promote public understanding of the Washington Department of Ecology's responsibilities, planning activities, and cleanup activities at hazardous waste sites. It also serves as a way of gathering information from the public that will help Ecology and Cenex begin the cleanup of the Site that is protective of human health and the environment. The Plan will help the community of Quincy to be informed regarding Site cleanup activities and contribute to the decision making process.

Documents relating to the cleanup may be reviewed at the repositories listed on page 12 of this Plan. If individuals are interested in knowing more about the

Site or have comments regarding the Public Participation Plan, please contact one of the individuals listed below:

Mr. Guy Gregory Senior Hydrogeologist/Site Manager Washington State Department of Ecology Toxics Cleanup Program 4601 North Monroe Spokane, WA 99205 (509) 456-6387 E-mail: ggre461@ecy.wa.gov Jerry Eide Cenex Harvest States Cooperatives P O Box 109 Stevensville, MT 59801 Barbara J. Smith Harris & Smith Public Affairs 600 Stewart Street #1116 Seattle, WA 98101 (206) 343-0250 barbara@harrisandsmith.com	Carol Bergin Public Involvement Washington State Departme of Ecology Toxics Cleanup Program 4601 North Monroe, Suite 2 Spokane, WA 99205 (509) 456-6360 E-mail: cabe461@ecy.wa.gov Johnnie Harris Public Disclosure Washington State Department of Ecology 4601 North Monroe Spokane, WA 99205 (509) 456-2751 e-mail: johh461@ecy.wa.gov **Para asistencia en Espanol**: Antonio Valero Washington Department of Ecology (509) 454-7840 e-mail: aval461@ecy.wa.gov

PUBLIC PARTICIPATION AND THE MODEL TOXICS CONTROL ACT

The Model Toxics Control Act (MTCA) is a citizens' initiative which passed in the November 1988 general election. It provides guidelines for the clean up of contaminated sites in Washington State. This law sets up strict standards to make sure the clean up of sites is protective of human health and the environment. The Department of Ecology's Toxic Cleanup Program investigates reports of contamination that may threaten human

health or the environment. If an investigation confirms the presence of contaminants, the site is ranked and placed on a Hazardous Sites List. Current or former owner(s) or operator(s), as well as any other potentially liable persons (PLPs), of a site may be held responsible for cleanup of contamination according to the standards set under MTCA. The PLPs are notified by Ecology that the site has contaminants and the process of cleanup begins with Ecology implementing and overseeing the project.

Public participation is an important part of the MTCA process during cleanup of sites. The participation needs are assessed at each site according to interest expressed by the public and degree of risk posed by contaminants. Individuals who live near the site, community groups, businesses, organizations and other interested parties are provided an opportunity to become involved in commenting on the cleanup process. The Public Participation Plan includes requirements for public notice such as: identifying reports about the site and the repositories where reports may be read; providing public comment periods; and holding public meetings or hearings. Other forms of participation may be interviews, citizen advisory groups, questionnaires, or workshops. Additionally, citizen groups living near contaminated sites may apply for public participation grants to receive technical assistance in understanding the cleanup process and to create additional public participation avenues.

The Department of Ecology prepared the proposed Public Participation Plan for the Cenex Supply and Marketing Facility, and maintains responsibility for public participation at the Site. Cenex will help coordinate and implement the public participation.

SITE BACKGROUND

SITE DESCRIPTION AND HISTORY

The former rinsate pond and fumigant storage facility has a history of agricultural activity. The property, currently owned by Burlington Northern Railroad, was part of a livestock operation in the 1950's. It was generally vacant until 1974.

In 1974, Western Farmers Cooperative built and operated a liquid fertilizer and soil fumigant storage facility at the Site. Tanks used at the facility stored products such as the fumigants DD, DD with

Chloropicrin, Telone, and Telone C-17. Other tanks stored fertilizers such as UAN 32-0-0, and Aqua Ammonia. A gunnite coated earthen berm served as secondary containment for the tanks. Product was transferred to trucks and other application apparatus outside the containment berm using a pump and hose system.

In 1982, Cenex Supply and Marketing acquired the assets and took an assignment of the Burlington Northern Lease for the real property from Western Farmers Association. Cenex is a retailer of farm supplies including feed, seed, petroleum, grain marketing, plant food and other farm products. The facility was operated by Cenex and used for storage and distribution of agricultural chemicals until dismantling in 1992.

Fumigants DD, DD with Chlorpicrin, Telone, and Telone C-17 were managed on the property. 1,2-Dichloropropane is a constituent of these fumigants. Fertilizers UAN 32-0-0, Aqua Ammonia, and 9-30-0 were stored at the property prior the 1992 dismantling. In the early 1980's, releases of soil fumigants are reported to have occurred.

In 1986 Cenex built a rinsate collection system to contain herbicides and pesticides generated while cleaning equipment and pesticide containers before being disposed. The rinsate pond accumulated rinse water until 1988, at which time the pond was drained. In the spring of 1990, the water and rinsate residue were tested and land applied, while the pond and pad were dismantled and backfilled.

Between August 1994 and February 1995, all former fumigant storage tanks were decontaminated and removed by Cenex. In 1997, rinsate pond soils and stockpiled concrete were removed from the property and the Site was covered with six inches of gravel. In 1998, a soil vapor extraction system and pilot scale operation of a ground water air sparge system began operation as an interim action.

CONTAMINANTS OF CONCERN

Contaminants being remediated at the Site are fumigant residues, mainly 1,2-Dichloropropane. Actions have been taken to cleanup the Site, and they are outlined under Site Cleanup Process on page seven.

COMMUNITY BACKGROUND

COMMUNITY PROFILE

The City of Quincy lies on the western border of Grant County and is a growing agricultural community with a population of 4,185. Quincy has a growing cultural diversity with approximately 75 percent of the elementary schools being comprised of children from Latino heritage and 75 percent of the high school from Caucasian heritage. The main economic focus is on farming with Lamb-Weston and Simplot being two of the largest businesses located in the area.

COMMUNITY CONCERNS

A core group of citizens in Quincy have expressed concerns about the cleanup process and chemicals of concern on and around the Site. As a result of continued concern, a citizen group called "Quincy Concern" was formed. The group is coordinated by former Quincy Mayor, Patty Martin and consists of approximately six members.

Quincy Concern received a Public Participation Grant from Ecology for 1998-99 and 1999-2000 to provide technical oversight and public education. David Yonge was hired as the technical consultant from the Department of Civil and Environmental Engineering at Washington State University (WSU) to review documents produced during the stages of cleanup at the Site. He is being assisted by Akram Hossain also from WSU. Two public meetings have been held by the group to explain site history and cleanup activities and discuss subsurface contamination.

A current primary concern of this group is air monitoring at the Quincy High School. Quincy Concern was influential in persuading consultants for Cenex to conduct additional air sampling at the high school. Sampling was conducted in August 2000, and none of the samples done during a two-day period detected 1,2 dichloropropane, however, the group continues to have concerns regarding air quality at the high school. A website has been created by Quincy Concern to distribute information to the public. It is located at www.cmer.wsu.edu/~yonge/quincy/quincypub.htm.

Community concerns have also been provided to Ecology by Jerry Husband. Jerry was the Chairman of Ecology's Eastern Regional Citizens' Advisory Committee. The committee was authorized under the Model Toxics Control Act WAC 173-340-610 to promote public involvement and advise Ecology of citizen concerns regarding cleanup activities throughout the Eastern Region. His feedback indicated there are Quincy citizens who feel good about the cleanup and public outreach work being conducted by Ecology and Cenex.

SITE CLEANUP PROCESS

Actions taken under Washington State Dangerous Waste Regulations (Ch. 173-303 WAC)

On April 6, 1992, following a facility visit, Ecology issued Compliance Order DE92HS-903 to Cenex requiring a Site Assessment Plan for the Site, specifically in and around the former rinsate pond. The initial plan was submitted on July 24, 1992.

The United States Environmental Protection Agency (EPA) conducted a Site Assessment on the property on May 10 and May 11, 1993. The purpose of the Site Assessment was to collect data to be used to confirm the presence or absence of target Resource Conservation and Recovery Act (RCRA) listed compounds to determine if violations of RCRA and/or the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) had occurred.

On May 19, 1993, Ecology requested that Cenex properly dispose of the fumigant tanks and the sludge contained in the tanks. The tanks were removed between August 1994 and February 1995. A revised Site Assessment Plan was completed on April 7, 1995 including the fumigant storage facility area and adjacent soil. Site assessment fieldwork began in June of 1995.

The 1995 Site Assessment focused on concrete and soils in the rinsate pond, rinse pad, and fumigant storage facility containment areas. Over 100 soil and concrete samples were collected from 26 locations. Chemical analysis of those samples focused on herbicides and metals found during the EPA Site investigation: alachlor, trifluralin, disulfoton, atrazine, vernolate, beryllium, cadmium, and chromium.

The fumigants 1,2-Dichloropropane (1,2-D), 1,3-Dichloropropane (1,3-D) and nitrogen compounds, nitrate and ammonia were also investigated.

Additionally, nine ground water monitoring wells, numbered MW1- through 9, were installed as a part of this Site Assessment in three phases between December of 1995 and October of 1996. Initial sampling covered the same chemicals as the soil investigation, including the soil fumigants and nitrogen compounds.

The results of the above investigations are found in the Remedial Investigation Report (WCEC, 1997a).

Stockpiled soils and concrete were removed from the Site in May of 1997. Further investigations were conducted to determine chemical constituents in remaining soil. Additionally, a soil gas survey was conducted to determine the extent of 1,2-D vapors in soil, and to evaluate the physical properties of unsaturated soils controlling movement of those vapors. Four monitoring wells (MW-10 through - 13) were installed to further define the breadth and extent of the 1,2-D plume in the ground water downgradient from the Site.

The results from these investigations are found in the Supplement to the Remedial Investigation Report (WCEC, 1997b).

Since the Supplement was completed, additional ground water monitoring wells have been installed to further define the extent of the 1,2-D plume and other volatile organic chemicals in the area (WCEC, 1999). Most wells off of Cenex-controlled property are installed in pairs with one well in the upper portion of the shallow ground water approximately 20 feet below ground surface, and one well in the lower portion of the shallow ground water, approximately 40 feet below ground surface. Some 29 wells are currently in place (Figure 2).

In late 1997 and early 1998, a vapor sampling effort was conducted in Quincy High School, to determine potential exposure to chemicals released from ground water. Vapor probes were installed in soils to test subsurface gas, and a test using passive organic vapor monitoring badges was conducted in and around Quincy High School. Results

indicated that levels of 1,2-DCP in soil gas were highest in soils on Cenex-controlled property. Low concentrations of 1,2-DCP in soil gas were detected on Quincy High School property. One passive badge (out of 11 samples) returned a detection of 1,2-DCP, near the detection limit of the method, in Quincy High School.

Actions taken under the Model Toxics Control Act (Ch. 173-340 WAC)

On July 22, 1998, Ecology and Cenex entered into Agreed Order DE98TC-E102, to conduct Site investigation and cleanup activities under the authority of the Model Toxics Control Act, Ch 70.105D RCW. The Order required installation of wells and soil borings to define the extent of the contamination in ground water; implementation of a regular schedule of ground water sampling; implementation of soil vapor extraction (SVE) as an interim action to remove and destroy volatile organic compounds from the soils on the Cenex-controlled property; and evaluation of various ground water treatment technologies.

The Washington Department of Health (WDOH) is completing a formal Health Assessment for the facility. The draft Health Assessment (WDOH, 1999) noted that the results of environmental investigations since 1993 confirmed the presence of contaminants in soils, ground water, and soil gas extending off Cenex-controlled property. After evaluation of environmental data, WDOH concluded that no apparent public health hazard existed for adults or children who could have been exposed through ingestion or skin contact to contaminants detected in soil. WDOH also concluded no current public health hazard exists for exposure to contaminated ground water, though a future health hazard may exist if exposure to ground water occurs through domestic uses. WDOH concluded that no apparent public health hazard exists for persons exposed to fumigant chemicals detected in indoor air. However, based upon results of the limited indoor air-sampling event, WDOH recommended additional air sampling to confirm the passive-method results.

The Feasibility Study, final in May 2000, presented the results of the interim actions and evaluated remedial alternatives for final cleanup.

In August 2000 an indoor air quality study was performed by Envirometrics, Inc. of Seattle, Washington using passive air sampling canisters (U.S. Environmental Protection Agency Method TO-14), which provide for a more sensitive and reliable analysis of ambient air quality than the OVMs. "Six air sampling canisters were deployed in school building in Quincy to determine if 1,2 dichloropropane might be entering the air of Quincy High School from a contaminated groundwater plume which is migrating from the Cenex Quincy facility. None of the samplers detected the chemical during a two-day sampling period in August, 2000."

DRAFT CLEANUP ACTION PLAN (DCAP)

The DCAP is a document prepared by Ecology, which describes the selected cleanup actions for the Site based on information from the Remedial Investigation and Feasibility Study. MTCA specifies criteria for selecting cleanup actions. All cleanup actions must be protective of human health and the environment, in compliance with cleanup standards and applicable state and federal laws, provide permanent solutions to the maximum extent practicable in a reasonable time frame, and include monitoring to ensure compliance.

REMEDIAL ACTION OBJECTIVES:

Based upon data to date, Cenex and Ecology believe further actions are necessary to protect human health and the environment. Actions are necessary to:

- Eliminate direct contact with soils bearing chemicals above cleanup levels;
- Eliminate direct contact with and ingestion of ground water containing chemicals of concern above cleanup levels;
- Eliminate transfer of chemicals from soils to ground water to protect beneficial uses;
- Restore beneficial uses of ground water at the point of compliance; and
- Evaluate, and if necessary eliminate, exposure to chemical-bearing soil gas.

PROPOSED ACTIONS

To accomplish these objectives, Ecology proposes, in the DCAP, that Cenex take the following actions:

- Asphalt capping of on-property soils.

  Site soils containing fumigant chemicals above cleanup levels will be paved with asphalt to eliminate exposure.

- Installation of on-property treatment systems, including:

  - Vapor Extraction of chemicals from soils above the caliche zone;
  - In-Situ air stripping and microsparge to remove chemicals from ground water; and
  - Oxygenation of ground water by air sparging

  Fumigant chemicals in soil will be actively removed using soil vapor extraction, and chemicals in ground water will be physically removed via in-situ air stripping. Natural attenuation of those chemicals downgradient will be enhanced via oxygenation of ground water promoting chemical and biological decomposition.

- Monitoring and institutional controls on exposure to off-property ground water.

  Exposure to downgradient ground water containing Site chemicals above cleanup levels will be restricted through property restrictions prohibiting domestic use. Ground water will be monitored on an ongoing basis to evaluate performance of treatment systems.

Air Monitoring Evaluation of Quincy High School

Additional air monitoring will be conducted to confirm test results that indicate there is no exposure of students to Site chemicals at Quincy High School.

PUBLIC PARTICIPATION ACTIVITIES AND TIMELINE

The following are public participation efforts which will occur until the cleanup actions are completed:

- A **mailing list** was developed of all individuals who reside within the potentially affected area of the Site. Homes and/or businesses within a few blocks' radius of the Site were added to the mailing list. These persons will receive copies of all fact sheets developed regarding the cleanup process of the Site via first class mail. Additionally, individuals, organizations, local, state and federal governments, and any other interested parties will be added to the mailing list. Other interested persons may request to be on the mailing list at any time by contacting Carol Bergin at the Department of Ecology (see page three for addresses/phone and e-mail).

- **Public Repositories** have been established and documents may be reviewed at the following offices:

  Department of Ecology
  4601 N. Monroe
  Spokane, WA 99205

  Quincy City Hall
  104 B Street Southwest
  Quincy, WA 98823

  Grant County Health District
  35 First and C Street
  Ephrata, WA 98823

- During each stage of cleanup **fact sheets** are created by Ecology, reviewed by Cenex and distributed to individuals on the mailing list. These fact sheets explain the stage of cleanup, the Site background, what happens next in the cleanup process and ask for comments from the public. A **thirty (30) day comment period** allows interested parties time to comment on the process. The information from these fact sheets is also published in a **Site Register** which is distributed to the public. Persons interested in receiving the Site Register should contact Sherrie Minnick of Ecology at (360) 407-7200 or e-mail smin461@ecy.wa.gov.

- **Display ads or legal notices** are published in the Quincy Valley Post Register and El Mundo newspapers to inform the general public. These notices correlate with the thirty-day comment period and associated stage of cleanup. They are also used to announce public meetings and workshops or public hearings.

- **Public meetings, workshops, open houses and public hearings** are held based upon the level of community interest. If ten or more persons request a public meeting based on the subject of the public notice, Ecology will hold a meeting and gather comments. Public meetings sponsored by Ecology are generally held at the Quincy Community Center, 115 "F" SW in Quincy.

Written comments which are received during the thirty-day comment period will be responded to in a **Responsiveness Summary**. The Responsiveness Summary will be sent to those who make the written comments and will be available for public review at the Repositories.

Answering Questions From The Public

Individuals in the community may have questions they want to ask so they may better understand the cleanup process. Page three lists the contacts for the Site. Interested persons are encouraged to contact these persons by phone or e-mail to obtain information about the Site, the process and potential decisions.

Obtaining Community Input On Site Decisions

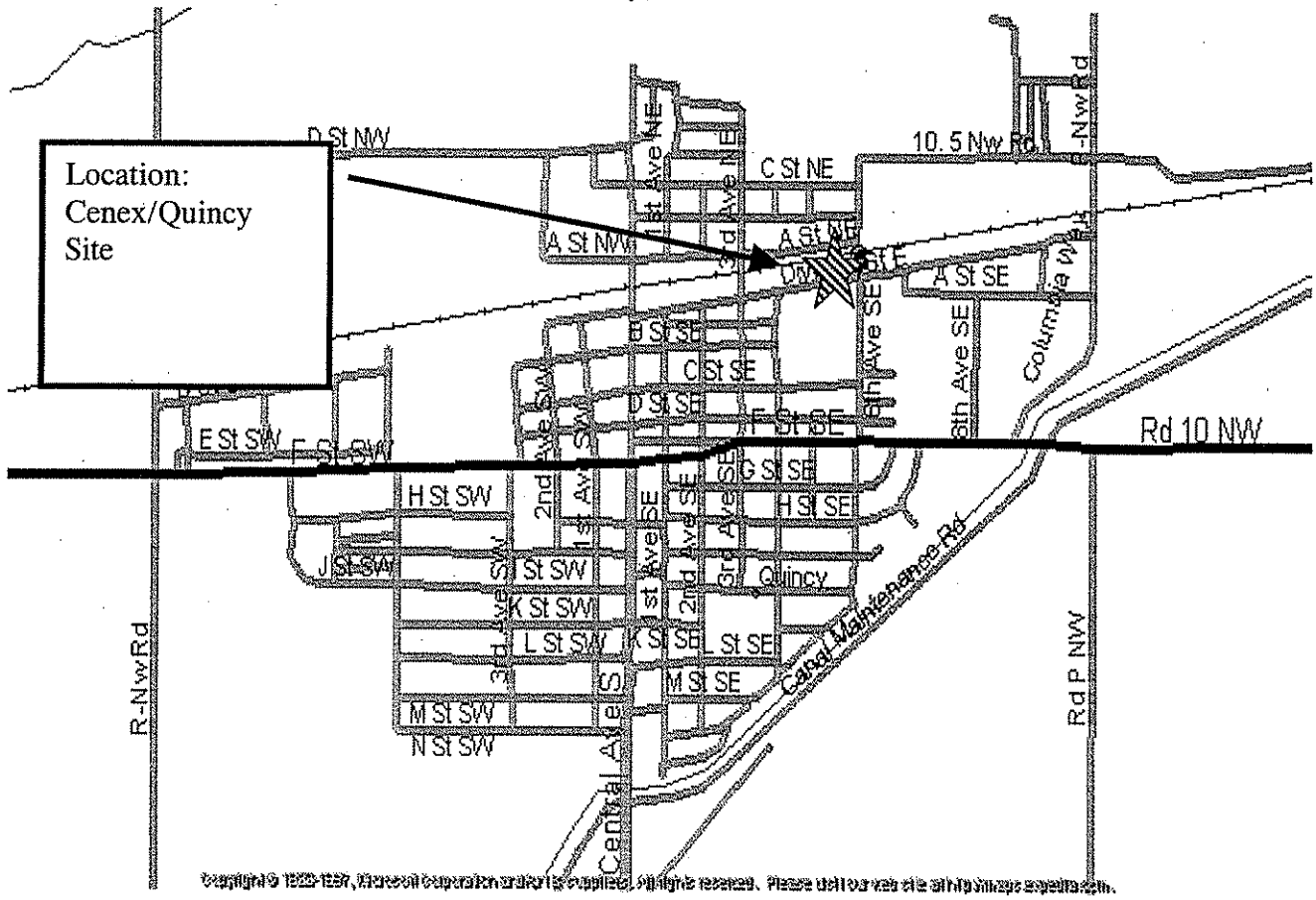
Community input has been sought through public meetings and workshops held in Quincy, fact sheets and public comment periods and one-on-one conversations with interested citizens. The Quincy Concern group and Jerry Husband have also been sources of public input as outlined previously.

PUBLIC NOTICE AND COMMENT PERIODS - TIME LINE

DATE	ACTION TAKEN
April, 1997	Cenex Community Update authored by Cenex
June, 1997	Cenex Update: Additional Testing and Cleanup Underway at Quincy Site authored by Cenex
October 22, 1997	Fact Sheet: Environmental Health update (Cenex-Quincy) from the Washington State Department of Health
December, 1997	Cenex Update: Cenex Receives Positive Results from Cleanup Investigation in Quincy authored by Cenex
April, 1998	Fact Sheet: Health Consultation Findings authored by the Washington State Department of Health
July 22, 1998 through August 21, 1998	Fact Sheet and thirty day public comment period: Agreed Order and Interim Action authored by Ecology
August 18, 1998	Public Meeting re: Agreed Order and Interim Action by Ecology and Cenex
August, 1998	Fact Sheet: Health Consultation Findings authored by Washington State Department of Health
December, 1998	Cenex Update: Cleanup Underway with Cenex and the Department of Ecology authored by Cenex
May 1, 2000 through May 30, 2000	Fact Sheet and thirty day public comment period: Feasibility Study authored by Ecology
May 4, 2000	Public Meeting re: Feasibility Study by Ecology and Cenex
November 2000	Cenex Update: Cleanup Action Plan Ready for Review authored by Cenex
January, 2001	Fact Sheet and thirty- day public comment period re: Proposed Consent Decree, Draft Cleanup Action Plan and SEPA DNS authored by Ecology

APPENDIX A
SITE MAP
FIGURE 1

Quincy, WA


Location:
Cenex/Quincy
Site
D St NW
C St NE
A St NW
A St NE
A St SE
B St SE
C St SE
D St SE
F St SE
G St SE
H St SE
E St SW
F St SW
H St SW
J St SW
I St SW
K St SW
L St SW
K St SE
L St SE
M St SE
M St SW
N St SW
Quincy
Rd 10 NW
10. 5 Nw Rd
Canal Maintenance Rd
Rd P NW
R-Nw Rd
Central Ave
1st Ave NE
2nd Ave NE
3rd Ave SE
5th Ave SE
6th Ave SE
1st Ave SW
2nd Ave SW
3rd Ave SW
1st Ave SE
2nd Ave SE
Columbia Valley

APPENDIX B

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APPENDIX C
GLOSSARY

AGREED ORDER: A legal document issued by Ecology which formalizes an agreement between the department and potentially liable persons (PLPs) for the actions needed at a site. An agreed order is subject to public comment. If an order is substantially changed, an additional comment period is provided.

Applicable State and Federal Law: All legally applicable requirements and those requirements that Ecology determines are relevant and appropriate requirements.

Area Background: The concentrations of hazardous substances that are consistently present in the environment in the vicinity of a site which are the result of human activities unrelated to releases from that site.

Carcinogen: Any substance or agent that produces or tends to produce cancer in humans.

Chronic Toxicity: The ability of a hazardous substance to cause injury or death to an organism resulting from repeated or constant exposure to the hazardous substance over an extended period of time.

Cleanup: The implementation of a cleanup action or interim action.

Cleanup Action: Any remedial action, except interim actions, taken at a site to eliminate, render less toxic, stabilize, contain, immobilize, isolate, treat, destroy, or remove a hazardous substance that complies with cleanup levels; utilizes permanent solutions to the maximum extent practicable; and includes adequate monitoring to ensure the effectiveness of the cleanup action.

CLEANUP ACTION PLAN: A document which identifies the cleanup action and specifies cleanup standards and other requirements for a particular site. After completion of a comment period on a Draft Cleanup Action Plan, Ecology will issue a final Cleanup Action Plan.

Cleanup Level: The concentration of a hazardous substance in soil, water, air or sediment that is determined to be protective of human health and the environment under specified exposure conditions.

Cleanup Process: The process for identifying, investigating, and cleaning up hazardous waste sites.

CONSENT DECREE: A legal document, approved and issued by a court which formalizes an agreement reached between the state and potentially liable persons (PLPs) on the actions needed at a site. A decree is subject to public comment. If a decree is substantially changed, an additional comment period is provided.

Containment: A container, vessel, barrier, or structure, whether natural or constructed, which confines a hazardous substance within a defined boundary and prevents or minimizes its release into the environment.

CONTAMINANT: Any hazardous substance that does not occur naturally or occurs at greater than natural background levels.

Enforcement Order: A legal document, issued by Ecology, requiring remedial action. Failure to comply with an enforcement order may result in substantial liability for costs and penalties. An enforcement order is subject to public comment. If an enforcement order is substantially changed, an additional comment period is provided.

Environment: Any plant, animal, natural resource, surface water (including underlying sediments), ground water, drinking water supply, land surface (including tidelands and shorelands) or subsurface strata, or ambient air within the state of Washington.

Exposure: Subjection of an organism to the action, influence or effect of a hazardous substance (chemical agent) or physical agent.

EXPOSURE PATHWAYS: The path a hazardous substance takes or could take form a source to an exposed organism. An exposure pathway describes the mechanism by which an individual or population is exposed or has the potential to be exposed to hazardous substances at or originating from the site. Each exposure pathway includes an

actual or potential source or release from a source, an exposure point, and an exposure route. If the source exposure point differs from the source of the hazardous substance, exposure pathway also includes a transport/exposure medium.

Facility: Any building, structure, installation, equipment, pipe or pipeline (including any pipe into a sewer or publicly-owned treatment works), well, pit, pond, lagoon, impoundment, ditch, landfill, storage container, motor vehicle, rolling stock, vessel, or aircraft; or any site or area where a hazardous substance, other than a consumer product in consumer use, has been deposited, stored, disposed or, placed, or otherwise come to be located.

FEASIBILITY STUDY (FS): A study to evaluate alternative cleanup actions for a site. A comment period on the draft report is required. Ecology selects the preferred alternative after reviewing those documents.

Free Product: A hazardous substance that is present as a nonaqueous phase liquid (that is, liquid not dissolved in water).

GROUNDWATER: Water found beneath the earth's surface that fills pores between materials such as sand, soil, or gravel. In aquifers, groundwater occurs in sufficient quantities that it can be used for drinking water, irrigation, and other purposes.

HAZARDOUS SITES LIST: A list of sites identified by Ecology that requires further remedial action. The sites are ranked from 1 to 5 to indicate their relative priority for further action.

Hazardous Substance: Any dangerous or extremely hazardous waste as defined in RCW 70.105.010 (5) (any discarded, useless, unwanted, or abandoned substances including, but not limited to, certain pesticides, or any residues or containers of such substances which are disposed of in such quantity or concentration as to pose a substantial present or potential hazard to human health, wildlife, or the environment because such wastes or constituents or combinations of such wastes; (a) have short-lived, toxic properties that may cause death, injury, or illness or have mutagenic, teratogenic, or carcinogenic properties; or (b) are corrosive, explosive, flammable, or may generate pressure through decomposition or other means,) and

(6) (any dangerous waste which (a) will persist in a hazardous form for several years or more at a disposal site and which in its persistent form presents a significant environmental hazard and may affect the genetic makeup of man or wildlife; and is highly toxic to man or wildlife; (b) if disposed of at a disposal site in such quantities as would present an extreme hazard to man or the environment), or any dangerous or extremely dangerous waste as designated by rule under Chapter 70.105 RCW: any hazardous substance as defined in RCW 70.105.010 (14) (any liquid, solid, gas, or sludge, including any material, substance, product, commodity, or waste, regardless of quantity, that exhibits any of the characteristics or criteria of hazardous waste as described in rules adopted under this chapter,) or any hazardous substance as defined by rule under Chapter 70.105 RCW; petroleum products.

Hazardous Waste Site: Any facility where there has been a confirmation of a release or threatened release of a hazardous substance that requires remedial action.

Independent Cleanup Action: Any remedial action conducted without Ecology oversight or approval, and not under an order or decree.

Initial Investigation: An investigation to determine that a release or threatened release may have occurred that warrants further action.

INTERIM ACTION: Any remedial action that partially addresses the cleanup of a site.

Mixed Funding: Any funding, either in the form of a loan or a contribution, provided to potentially liable persons from the state toxics control account.

MODEL TOXICS CONTROL ACT (MTCA): Washington State's law that governs the investigation, evaluation and cleanup of hazardous waste sites. Refers to RCW 70.105D. It was approved by voters at the November 1988 general election and known is as Initiative 97. The implementing regulation is WAC 173-340.

MONITORING WELLS: Special wells drilled at specific locations on or off a hazardous waste site where groundwater can be sampled at selected

depths and studied to determine the direction of groundwater flow and the types and amounts of contaminants present.

Natural Background: The concentration of hazardous substance consistently present in the environment which has not been influenced by localized human activities.

National Priorities List (NPL): EPA's list of hazardous waste sites identified for possible long-term remedial response with funding from the federal Superfund trust fund.

Owner or Operator: Any person with any ownership interest in the facility or who exercises any control over the facility; or in the case of an abandoned facility, any person who had owned or operated or exercised control over the facility any time before its abandonment.

POLYNUCLEAR AROMATIC HYDROCARBON (PAH): A class of organic compounds, some of which are long-lasting and carcinogenic. These compounds are formed from the combustion of organic material and are ubiquitous in the environment. PAHs are commonly formed by forest fires and by the combustion of fossil fuels.

Potentially Liable Person (PLP): Any person whom Ecology finds, based on credible evidence, to be liable under authority of RCW 70.105D.040.

Public Notice: At a minimum, adequate notice mailed to all persons who have made a timely request of Ecology and to persons residing in the potentially affected vicinity of the proposed action; mailed to appropriate news media; published in the local (city or county) newspaper of largest circulation; and opportunity for interested persons to comment.

Public Participation Plan: A plan prepared under the authority of WAC 173-340-600 to encourage coordinated and effective public involvement tailored to the public's needs at a particular site.

Recovery By-Products: Any hazardous substance, water, sludge, or other materials collected in the free product removal process in response to a release from an underground storage tank.

Release: Any intentional or unintentional entry of any hazardous substance into the environment, including, but not limited to, the abandonment or disposal of containers of hazardous substances.

REMEDIAL ACTION: Any action to identify, eliminate, or minimize any threat posed by hazardous substances to human health or the environment, including any investigative and monitoring activities of any release or threatened release of a hazardous substance and any health assessments or health effects studies.

REMEDIAL INVESTIGATION: A study to define the extent of problems at a site. When combined with a study to evaluate alternative cleanup actions it is referred to as a Remedial Investigation/Feasibility Study (RI/FS). In both cases, a comment period on the draft report is required.

Responsiveness Summary: A compilation of all questions and comments to a document open for public comment and their respective answers/replies by Ecology. The Responsiveness Summary is mailed, at a minimum, to those who provided comments and its availability is published in the Site Register.

RISK ASSESSMENT: The determination of the probability that a hazardous substance, when released into the environment, will cause an adverse effect in exposed humans or other living organisms.

Sensitive Environment: An area of particular environmental value, where a release could pose a greater threat than in other areas including: wetlands; critical habitat for endangered or threatened species; national or state wildlife refuge; critical habitat, breeding or feeding area for fish or shellfish; wild or scenic river; rookery; riparian area; big game winter range.

Site: See Facility.

Site Characterization Report: A written report describing the site and nature of a release from an underground storage tank, as described in WAC 173-340-450 (4) (b).

Site Hazard Assessment (SHA): An assessment to gather information about a site to confirm whether a release has occurred and to enable Ecology to evaluate the relative potential hazard posed by the release. If further action is needed, an RI/FS is undertaken.

Site Register: Publication issued every two weeks of major activities conducted statewide related to the study and cleanup of hazardous waste sites under the Model Toxics Control Act. To receive this publication, please call (360) 407-7200.

Surface Water: Lakes, rivers, ponds, streams, inland waters, salt waters, and all other surface waters and water courses within the state of Washington or under the jurisdiction of the state of Washington.

TCP: Toxics Cleanup Program at Ecology

TOTAL PETROLEUM HYDROCARBONS (TPH): A scientific measure of the sum of all petroleum hydrocarbons in a sample (without distinguishing one hydrocarbon from another). The "petroleum hydrocarbons" include compounds of carbon and hydrogen that are derived from naturally occurring petroleum sources or from manufactured petroleum products (such as refined oil, coal, and asphalt).

TOXICITY: The degree to which a substance at a particular concentration is capable of causing harm to living organisms, including people, plants and animals.

Underground Storage Tank (UST): An underground storage tank and connected underground piping as defined in the rules adopted under Chapter 90.76 RCW.

Washington Ranking Method (WARM): Method used to rank sites placed on the hazardous sites list. A report describing this method is available from Ecology.