Frank Wear Cleaners
FS 444

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

In the Matter of Remedial Action by:	)	
	)	
	)	AGREED ORDER
Frank Wear Cleaners Facility	)	
106 South Third Street	)	No. DE 94TC-C420
Yakima, WA 98902	)	

TO: Frank Wear Cleaners
c/o Mr. G. A. Stouffers
106 South Third Street
Yakima, WA 98902

I.

Jurisdiction

This Agreed Order ("Order") is issued pursuant to the authority of Revised Code of Washington (RCW) 70.105D.050(1).

II.

Findings of Fact

The Department of Ecology (Ecology) makes the following Findings of Fact, without admission of such facts by Frank Wear Cleaners.

2.1. Frank Wear Cleaners owns the property ("the Facility") at 106 South Third Street in Yakima, Washington. The property is located in the N.E. 1/4 of the S.E. 1/4 of Section 24, Township 13 North, Range 18 E.W.N. The parcel number of this property is 18132441442.

2.2 Tetrachloroethylene (PCE) has been found in the near surface soil at the Frank Wear Cleaners Facility at 10000 ppb and 600 ppb (soil samples of November 29, 1989).

2.3 PCE is widely prevalent throughout the shallow Yakima Basin aquifer. The Washington Department of Health Advisory Level for drinking water is 4 ppb for PCE. The United States Environmental Protection Agency Maximum Contaminant Level for drinking water in 5 ppb for PCE.

2.4 The water table in the Yakima area typically occurs at depths between 8 feet and 30 feet below ground surface. Wells exist in the Yakima Basin which withdraw water used for drinking from this shallow unconfined aquifer. The area contains deep, very well-drained soils formed in mixed alluvium. These soils have moderate to high permeabilities in the surface layers and very high permeabilities in the substratum.

2.5 The foregoing information in item 2.2 through item 2.4 is contained in the following documents:

(a) Science Applications International Corporation. April 1989. "Preliminary Assessment Report, Frank Wear Cleaners." Prepared for Washington Department of Ecology.

(b) Ecology and Environment, Inc. December 10, 1989. "Final Report for Yakima Soil Gas Study, Yakima, Washington." Prepared for United States Environmental Protection Agency, Region 10.

(c) Department of Ecology letter to G. A. Stouffers, February 5, 1990.

III.

Ecology Determinations

3.1. The Frank Wear Cleaners is an "owner or operator" as defined in RCW 70.105D.020(6) of a "Facility" as defined in RCW 70.105D.020(3).

3.2. The Facility is known as the Frank Wear Cleaners Site and is located at 106 South Third Avenue, in Yakima, Washington.

3.3. The substances found at the Facility as described in Section 2 are "hazardous substances" as defined in RCW 70.105D.020(5).

3.4. Based on the presence of these hazardous substances at the Facility and all factors known to Ecology, there is a release or threatened release of hazardous substances from the facility, as defined in RCW 70.105D.020(10).

3.5. By letter dated October 24, 1991, Ecology notified Frank Wear Cleaners of its status as a "potentially liable person" under RCW 70.105D.040 after notice and opportunity for

comment.

3.6. Pursuant to RCW 70.105D.030(1) and 70.105D.050, Ecology may require potentially liable persons to investigate or conduct other remedial actions with respect to the release or threatened release of hazardous substances, whenever it believes such action to be in the public interest.

3.7. Based on the foregoing findings of facts, Ecology believes the remedial action required by this Order is in the public interest.

IV.

Work to be Performed

Based on the foregoing Facts and Determinations, it is hereby ordered that Frank Wear Cleaners take the following remedial actions and that these actions be conducted in accordance with Chapter 173-340 WAC unless otherwise specifically provided for herein.

4.1 Frank Wear Cleaners shall conduct a Remedial Investigation (RI) as described in the enclosed Work Plan. The Work Plan is hereby incorporated into this Order by reference and is an integral and enforceable part of the Order.

4.2 The RI shall be based on the results of an Ecology approved Site History and Soil Vapor Assessment (as described in the Work Plan) submitted by Frank Wear Cleaners.

4.3 The results and analyses for the RI shall be submitted to Ecology for acceptance per Submittal Timelines in Figure 5 of the Work Plan. The Submittal Timelines for completion of the RI phases is hereby incorporated into this Order by reference and is an integral and enforceable part of the Order.

4.4 With Ecology's acceptance of the RI, Frank Wear Cleaners will submit to Ecology within 60 days a Scope of Work for a Feasibility Study (FS). This Scope of Work shall meet the requirements of WAC 173-340-350.

4.5 Upon Ecology approval of the FS Scope of Work, Frank Wear Cleaners shall commence FS activities as per Scope of Work.

4.6 In addition to the above, a monthly progress report on the RI must be submitted to Ecology by the last day of each month until the project is completed.

4.7 In accordance with WAC 173-340-840(5), groundwater sampling data shall be submitted according to Attachment A of the Work Plan: SITE DESCRIPTION AND SAMPLE DATA SUBMITTAL REQUIREMENTS. These submittals shall be provided to Ecology as required under the Submittal Timelines in provision 4.3. V.

Terms and Conditions of Order

5.1. Definitions Unless otherwise specified, the definitions set forth in Chapter 70.105D RCW and Chapter 173-340 WAC shall control the meanings of the terms used in this Order.

5.2. Public Notices RCW 70.105D.030(2)(a) requires that, at a minimum, this Order be subject to concurrent public notice. Ecology shall be responsible for providing such public notice and reserves the right to modify or withdraw any provisions of this Order should public comment disclose facts or considerations which indicate to Ecology that the Order is inadequate or improper in any respect.

5.3. Remedial Action Costs Frank Wear Cleaners shall pay to Ecology costs incurred by Ecology pursuant to this Order. These costs shall include work performed by Ecology or its contractors for investigations, remedial actions, and Order preparation, oversight and administration. For work performed prior to June 1, 1994, the amount of $1069.51 shall be paid to Ecology within 30 days of the effective date of this Order. For work commencing on June 1, 1994, and thereafter, Ecology costs shall include costs of direct activities and support costs of direct activities as defined in WAC 173-340-550(2), and interest charges for delayed payments, as defined in WAC 173-340-550(4).

Frank Wear Cleaners shall pay the required amount within ninety (90) days of receiving from Ecology an itemized statement of costs that includes a summary of costs incurred, an identification of involved staff, and the amount of time spent by involved staff members on the project. A general description of work performed will be provided upon request. Itemized statements shall be prepared quarterly. Failure to pay Ecology's costs within 90 days of receipt of the itemized statement of costs will result in interest charges.

5.4. Designated Project Coordinators
The project coordinator for Ecology is:

Mr. Rick Roeder
Department of Ecology
106 South Sixth Avenue
Yakima, WA 98902-3387

The project coordinator for Frank Wear Cleaners is:

Mr. G. A. Stouffers
106 South Third Avenue
Yakima, WA 98902

The project coordinator(s) shall be responsible for overseeing the implementation of this Order. To the maximum extent possible, communications between Ecology and Frank Wear Cleaners, and all documents, including reports, approvals, and other correspondence concerning the activities performed pursuant to the terms and conditions of this Order, shall be directed through the project coordinator(s). Should Ecology or Frank Wear Cleaners change project coordinator(s), written notification shall be provided to Ecology or Frank Wear Cleaners at least ten (10) calendar days prior to the change.

5.5. Performance All work performed pursuant to this Order shall be under the direction and supervision, as necessary, of a professional engineer or hydrogeologist, or similar expert, with appropriate training, experience and expertise in hazardous waste site investigation and cleanup. Frank Wear Cleaners shall notify Ecology as to the identity of such engineer(s) or hydrogeologist(s), and of any contractors and subcontractors to be used in carrying out the terms of this Order, in advance of their involvement at the Site. Frank Wear Cleaners shall provide a copy of this Order to all agents, contractors and subcontractors retained to perform work required by this Order and shall ensure that all work undertaken by such agents, contractors, and subcontractors will be in compliance with this Order.

Except where necessary to abate an emergency situation, Frank Wear Cleaners shall not perform any remedial actions at Frank Wear Cleaners site outside that required by this Order unless Ecology concurs, in writing, with such additional remedial actions.

5.6. Access Ecology or any Ecology authorized representative shall have the authority to enter and freely move about the Site at all reasonable times for the purposes of, inter alia: inspecting records, operation logs, and contracts related to the work being performed pursuant to this Order; reviewing the progress in carrying out the terms of this Order; conducting such tests or collecting samples as Ecology or the project coordinator may deem necessary; using a camera, sound recording, or other documentary type equipment to record work done pursuant to this Order; and verifying the data submitted to Ecology by Frank Wear Cleaners. By signing this Agreed Order, Frank Wear Cleaners

agrees that this Order constitutes reasonable notice of access, and agrees to allow access to the Site at all reasonable times for purposes of overseeing work performed under this Order. Ecology shall allow split or replicate samples to be taken by Frank Wear Cleaners during an inspection unless doing so interferes with Ecology's sampling. Frank Wear Cleaners shall allow split or replicate samples to be taken by Ecology and shall provide seven (7) days notice before any sampling activity.

5.7. Public Participation Frank Wear Cleaners shall prepare and/or update a public participation plan for the site. Ecology shall maintain the responsibility for public participation at the site. Frank Wear Cleaners shall help coordinate and implement public participation for the site.

5.8. Retention of Records Frank Wear Cleaners shall preserve in a readily retrievable fashion, during the pendency of this Order and for ten (10) years from the date of completion of the work performed pursuant to this Order, all records, reports, documents, and underlying data in its possession relevant to this Order. Should any portion of the work performed hereunder be undertaken through contractors or agents of Frank Wear Cleaners, then Frank Wear Cleaners agrees to include in their contract with such contractors or agents a record retention requirement meeting the terms of this paragraph.

5.9. Dispute Resolution Frank Wear Cleaners may request Ecology to resolve disputes which may arise during the implementation of this Order. Such requests shall be in writing and directed to the signatory, or his/her successor(s), to this Order. Ecology resolution of the dispute shall be binding and final. Frank Wear Cleaners is not relieved of any requirement of this Order during the pendency of the dispute and remains responsible for timely compliance with the terms of the Order unless otherwise provided by Ecology in writing.

5.10 Reservation of Rights/No Settlement This Agreed O[illegible] is not a settlement under Chapter 70.105D RCW. Ecology's s[illegible]nature on this Order in no way constitutes a covenant not to su[illegible]r a compromise of any Ecology rights or authority. Ecology w[illegible]l not, however, bring an action against Frank Wear Cleaners to re[illegible]ver remedial action costs paid to and received by Ecology unde[illegible]this Agreed Order. In addition, Ecology will not take additiona[illegible] enforcement actions against Frank Wear Cle[illegible]rs to r[illegible]e [illegible]ose remedial actions required by this Agreed Order, provided Fr[illegible]nk Wear Cleaners complies with this Agreed Order.

Ecology reserves the right, however, to require additional remedial actions at the Site should it deem such actions

necessary.

Ecology also reserves all rights regarding the injury to, destruction of, or loss of natural resources resulting from the releases or threatened releases of hazardous substances from Frank Wear Cleaners site.

In the event Ecology determines that conditions at the Site are creating or have the potential to create a danger to the health or welfare of the people on the Site or in the surrounding area or to the environment, Ecology may order Frank Wear Cleaners to stop further implementation of this Order for such period of time as needed to abate the danger.

5.11 Transference of Property No voluntary or involuntary conveyance or relinquishment of title, easement, leasehold, or other interest in any portion of the Site shall be consummated by Frank Wear Cleaners without provision for continued implementation of all requirements of this Order and implementation of any remedial actions found to be necessary as a result of this Order.

Prior to transfer of any legal or equitable interest Frank Wear Cleaners may have in the Site or any portions thereof, Frank Wear Cleaners shall serve a copy of this Order upon any prospective purchaser, lessee, transferee, assignee, or other successor in such interest. At least thirty (30) days prior to finalization of any transfer, Frank Wear Cleaners shall notify Ecology of the contemplated transfer.

5.12 Compliance with Other Applicable Laws All actions carried out by Frank Wear Cleaners pursuant to this Order shall be done in accordance with all applicable federal, state, and local requirements.

VI.

Satisfaction of this Order

The provisions of this Order shall be deemed satisfied upon Frank Wear Cleaner's receipt of written notification from Ecology that Frank Wear Cleaners has completed the remedial activity required by this Order, as amended by any modifications, and that all other provisions of this Agreed Order have been complied with.

VII.

Enforcement

7.1. Pursuant to RCW 70.105D.050, this Order may be enforced as follows:

A. The Attorney General may bring an action to enforce this Order in a state or federal court.

B. The Attorney General may seek, by filing an action, if necessary, to recover amounts spent by Ecology for investigative and remedial actions and Orders related to the Site.

C. In the event Frank Wear Cleaners refuses, without sufficient cause, to comply with any term of this Order, Frank Wear Cleaners will be liable for:

(1) up to three times the amount of any costs incurred by the state of Washington as a result of its refusal to comply; and

(2) civil penalties of up to $25,000 per day for each day it refuses to comply.

D. This Order is not appealable to the Washington Pollution Control Hearings Board. This Order may be reviewed only as provided under Section 6 of Chapter 70.105D RCW.

Effective date of this Order: NOV 07 1994

FRANK WEAR CLEANERS

By _____
Mr. G. A. ~~Stauffers~~ STOFFERS

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

By _____
Mr. Anthony W. Grover
Section Manager
Toxics Cleanup Program
Central Regional Office

AWG:RR:dk

(g:rick\frankwea.ao)

Frank Wear cleaners

ATTACHMENT

'A'

YAKIMA RAILROAD AREA (YRRA)

WORK PLAN

REMEDIAL INVESTIGATION (RI)

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YAKIMA RAILROAD AREA WORK PLAN

REMEDIAL INVESTIGATION (RI) ACTIVITIES

I. Purpose/Scope

The purpose of the Remedial Investigation (RI) is to determine the nature and extent of releases of hazardous substances (as defined by RCW 70.105D.020(5)) from the Facility (as defined in RCW 70.105D.020(3)), and to gather all necessary data to support the Feasibility Study (FS) which will follow.

The Facility is the Yakima Railroad Area (YRRA) as shown in Figure 1. Within the YRRA are specific sources, or what will be called subfacilities. At the present time this includes the following: Agri-Tech/Yakima Steel Fabricators; Cameron Yakima, Inc.; Westco Martinizing; Nu-Way Cleaners; Paxton Sales; Frank Wear Cleaners; Hahn Motors; Fifth Wheel Truck Repair; Yakima County (Crest Linen); U-Haul Company (Yakima Valley Spray); Crop King/Woods Industries (BNRR)(Figure 2: Map of YRRA/facilities).

This Work Plan describes the strategy and tasks for conducting a Remedial Investigation of Facilities within the Yakima Railroad Area. The primary goal of this Remedial Investigation is to obtain the information necessary to enable the identification and review of potential cleanup actions through a Feasibility Study. This will be accomplished by defining the geologic and hydrologic conditions, and the nature and extent of the soil, air, and groundwater contamination.

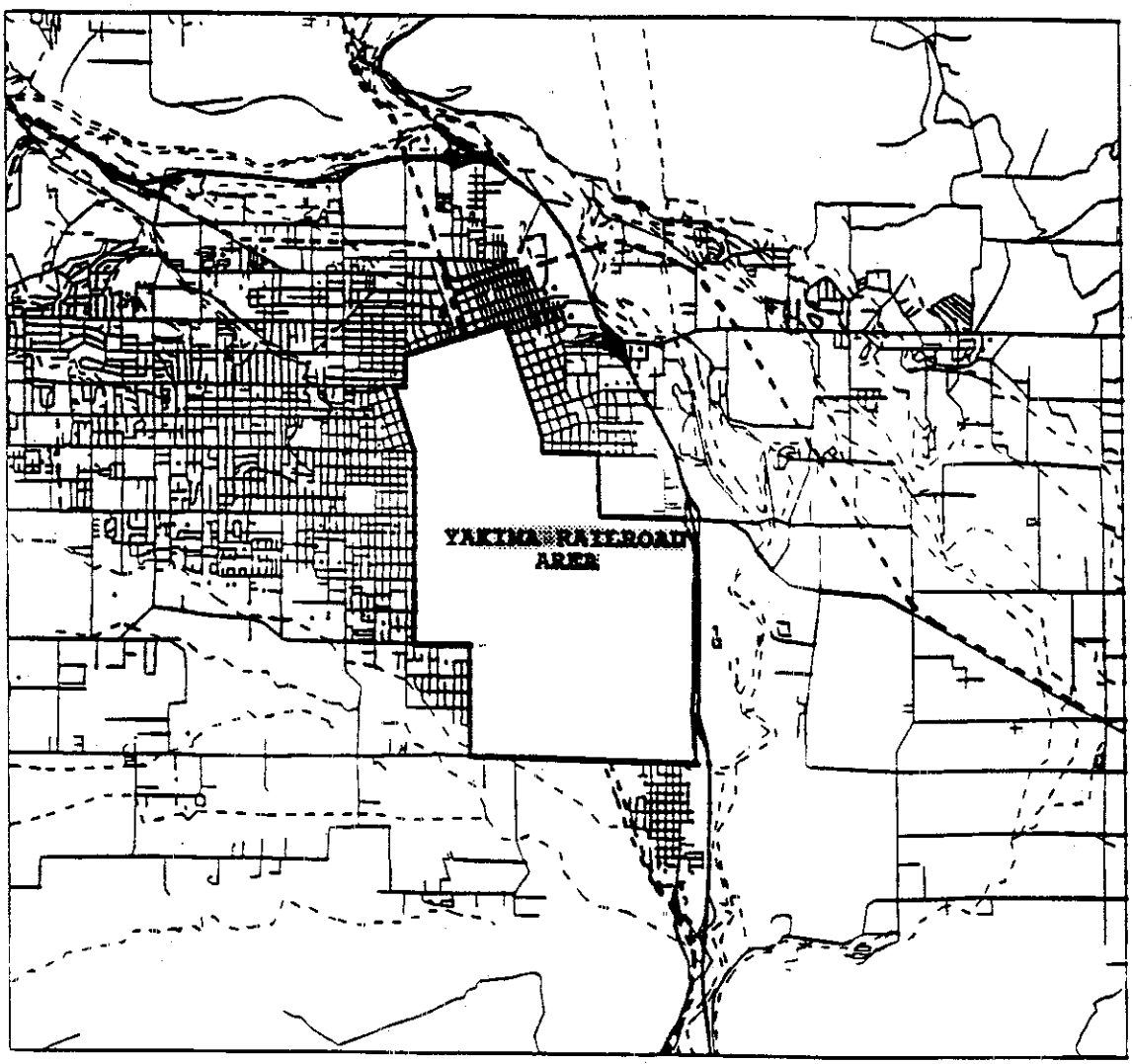
The procedures, methods, and processes defined in this document are available for use only to PLP's within the YRRA. The main intent is to provide a standardized data gathering system which provides for data of consistent quality, avoids duplication of efforts, and in general assists the PLP's within the YRRA in their efforts to fully investigate contamination at their specific subfacilities.

The Remedial Investigation will concentrate on these subfacilities as sources of Tetrachloroethylene (PCE) within the YRRA. This will then, either concurrently or subsequently, be followed by investigations which fill the "data gaps" necessary to fully understand the areawide issues including, groundwater flows, contaminant levels, and other issues.

This work plan presents a detailed discussion of the technical approach and the scope of investigations for the Yakima

Figure 1

YAKIMA RAILROAD AREA



Scale: 1 in = 2.8 mi

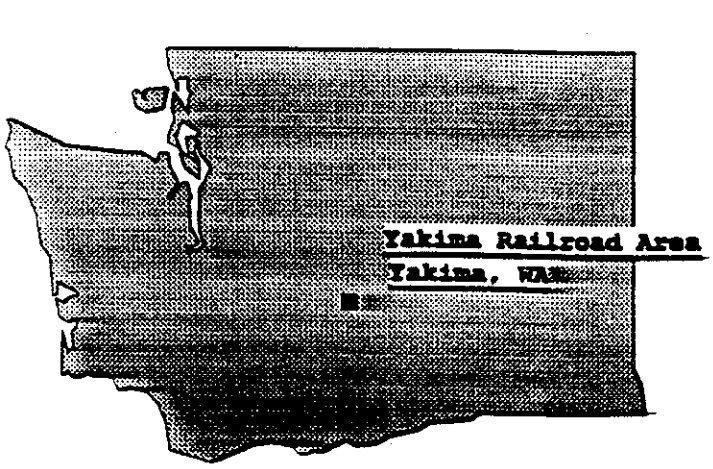
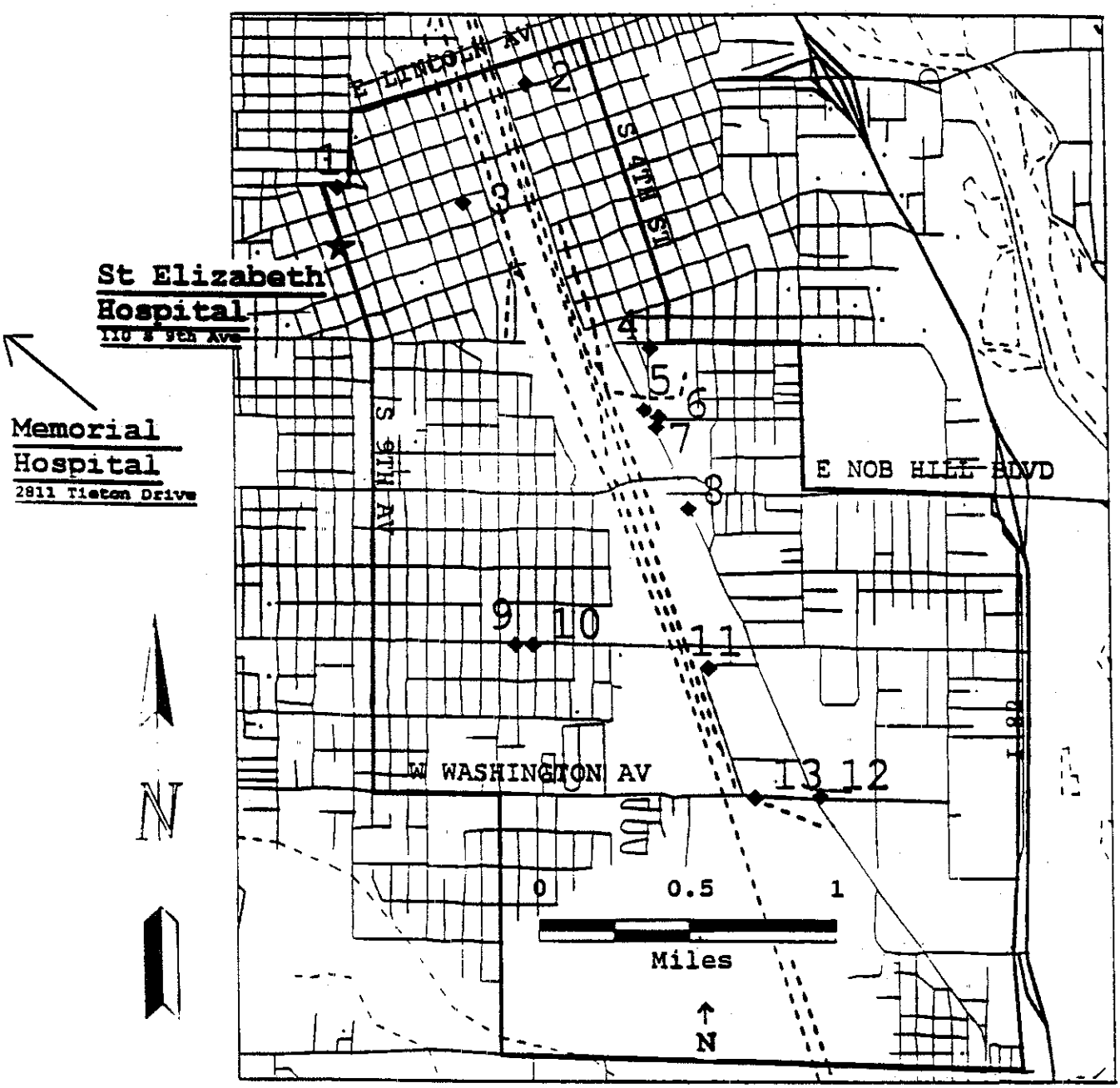


Figure 2

Yakima Railroad Area



Subfacilities within the Yakima Railroad Area

1: Westco Martinizing
2: Yakima County (Crest linen)
3: Frank Wear Cleaners
4: Nu-Way Cleaners
5: Yakima Valley Spray
6: 5th Wheel Truck Repair
7: Hahn Motor Company
8: Cameron-Yakima, Inc.
9: CMX Corporation
10: Paxton Sales
11: Crop King/Woods Ind. (BNRR)
12: Briar Development
13: Agri-Tech/Yakima Steel Fabricators

Railroad Area Facility. The organization of this work plan is as follows:

-- Facility Background Information: A brief description of the YRRA, and its subfacilities.

-- Existing Data: This section summarizes the sampling and data available presently for each subfacility and for the overall YRRA.

-- Work plan: This section presents the specific work plan to be followed for the YRRA and its subfacilities. This includes:

- Area-wide Investigations
- Subfacility Investigations
- Schedule (Project Completion Timelines)

-- Sampling and Analysis Plan

-- Quality Assurance/Quality Control Project Plan

-- Health and Safety Plan

Information developed in the early stages of the RI will be used to start the identification and consideration of cleanup actions that may be appropriate for use within the YRRA. This early screening of potential cleanup methods should help to conserve time and expenses by narrowing the focus of the Feasibility Study scheduled to follow the RI activities.

II. Facility Background Information

A. Facility Background

The Yakima Railroad Area (YRRA) was established by Ecology in response to the discovery of Tetrachloroethylene (PCE) in the shallow aquifer of the area. As shown in Figure 1, the area encompasses portions of the City of Yakima, City of Union Gap, and Yakima County.

Throughout the YRRA, groundwater is found at depths which range from 4 to 25 feet depending upon seasonal fluctuations. Flow velocities of 6-12 ft/day have been calculated for the YRRA (San Juan, 1993). The predominant flow direction is to the southeast towards the Yakima River. Depending upon specific locations, seasonal irrigation influences may cause flows to vary from nearly due south to due east.

Soils found within the YRRA include the Weirman, Zillah, Ashue, and Naches loams. Typical soil depths range from a few inches to several feet. Beneath the soils, geologic deposits include the Thorp gravels and Upper Ellensburg formations.

B. Facility Description:

The Yakima Railroad Area and its subfacilities are shown in Figure 2. In general the area is bound northerly by Lincoln Avenue; easterly by the irregular trace of 4th Street to Pacific Avenue; 10th Street to Nob Hill Boulevard; Rudkin Road to Valley Mall Boulevard; a line running due south from the southern end of Rudkin road to the point where it intersects a line running due east from the eastern end of Ahtanum road; and westerly by the irregular trace of 3rd Avenue to West Washington Avenue and 8th Avenue to Summitview Avenue; then Pierce Street to Lincoln Avenue (northern boundary).

Presently the area consists of thirteen subfacilities, three of which have completed investigations and exited the MTCA process via DeMinimis settlements (Briar Development, Yakima County, CMX). A fourth subfacility, WestCo, has indicated that they will be doing their own work plan. Because of the contaminant complexity of some of the sites; Yakima Valley Spray (U-Haul); Cameron-Yakima, Inc.; Crop King/Woods Industry (BNRR); and Agri-Tech/Yakima Steel Fabricators, they are ineligible to utilize this generic work plan. This work plan is thus applicable to five of the original thirteen, and a listing of contaminant classes known or suspected at these subfacilities are shown in Figure 3. As new subfacilities are identified within the YRRA, they will be evaluated by Ecology as to whether they are eligible to utilize this generic work plan.

Figure 3

Contaminant Classes Found
at YRRA Sub-facilities

Facility	BNA	Cyanoacetic Acid	Metals	SVOC	TPH*	VOA
Fifth Wheel Shop			√		√	√
Frank Wear Cleaners						√
Hahn Motor Company					√	√
Nu-Way Cleaners	√					√
Paxton Sales Corp.	√	√	√	√		√

Column heading terms:

BNA	Base/Neutral/Acid
Cyanoacetic Acid	Cyanoacetic Acid
Metals	Metals analysis
SVOC	Semi-Volatile Organic Analysis
TPH	Total Petroleum Hydrocarbon*
VOA	Volatile Organic Analysis

*See "Guidance for Remediation of Petroleum Contaminated Soils (PCS) Revised April 1994," Department of Ecology Publication #91-30.

III. Existing Data

Referenced below is an partial listing of documents which are available in the Department of Ecology's files in its Yakima office. No total listing is known to exist and it is each PLP's responsibility to fully research their own sites.

REPORTS AVAILABLE IN ECOLOGY'S FILES REGARDING THE YRRA

(1) Compilation of "Credible Evidence"; possible additional "PLPs", Yakima Railroad Study Area, Yakima, WA, January 31, 1992. Submitted by PLPs (Briar Development, Cameron-Yakima, Inc., Frank Wear Cleaners, Nu-Way Cleaners, Paxton Sales, and Yakima County).

(2) Delta Environmental: Consultants for Cameron Yakima per EPA Order; "Hydrological Assessment, 1414 South First Street, Yakima, WA Delta Project No. 40-89-044"; November 9, 1989.

(3) Dames & Moore Site Assessment of Briar Development: "Property Transfer Assessment, West Coast Grocery; Yakima, WA"; January, 1989.

(4) Screening Site Inspection Report for CMX: by Ecology and Environment, Inc.; January, 1990.

(5) Ecology & Environment. Soil Gas Survey, 1989.

(6) Hart Crowser. Prelim. Site Assessment (Cameron Yakima).

(7) Crop King. Removal Action reports and RI/FS.

(8) All subfacilities. Department of Ecology files.

(9) Ecology private well sampling event data (40 wells).

(10) Ecology & Environment Groundwater data. April, 1989.

(11) Ecology Agri-Tech sampling data. May, 1993.

(12) U.S. Geological Survey upgradient data.

IV. RI Scope of Work - Work Plan

The following section presents the remedial investigation methodology for subfacilities within the YRRA. The objective of these investigations is to gather sufficient data to identify the nature and extent of contamination and the selection of a cleanup action alternative(s).

TASK 1: Site History/Soil Vapor Assessment.

Site History: The PLP for each subfacility shall submit for Ecology review and approval a site history. The information gathered from this will be used to guide soil sampling, determine probable migration pathways, and identify possible contamination sources. This site history will provide pertinent background information including:

-- Maps depicting general geographic location; property lines and all adjacent property owners; waterways, floodplains, wetlands, drainage patterns; past and present above and below ground tanks and piping; buildings, utilities, paved areas, easements, zoning, rights-of-way, sumps, trenches, vaults, storm drains, and other features; past and present known or suspected hazardous substance treatment, storage, or disposal areas; and the location of all groundwater supply and monitoring wells within a half mile radius of the subfacility. The latter may result in door to door interviews with property owners to determine if they have domestic and or irrigation wells.

   One map for each subfacility shall include the longitude and latitude, or equivalent datum, for five surveyed points at the subfacility boundaries.

-- A history/description of ownership and operation; waste generation, treatment, storage and disposal activities.

-- A description of hazardous materials handled at the subfacility including; identification of materials spilled, and dates, location, and any corrective actions taken for past product or waste spills.

-- History and description of physical changes at the subfacility. This includes backfilling, building add-ons or erection, building demolition, subsurface construction, and other physical changes.

-- The location of all private/commercial/business ground water supply and monitoring wells within a

one half mile radius. Sources for well location and construction information shall include State and local environmental and public health agencies, supplemented with oral interviews with business owners to identify unreported or undocumented wells. Information from well surveys conducted by other Yakima Railroad Area PLPs and the Department of Ecology may be used if within the one-half mile radius of the subfacility.

Soil Vapor Assessment: The following section describes the methodology to be used when conducting soil vapor assessment. Information gathered from this will be submitted to Ecology with the site history.

A soil vapor assessment of each subfacility will be completed. The objectives of these surveys will be to:

- assess the lateral extent of target volatile organic compounds (VOC's) in soil vapors of the vadose zone
- make a preliminary determination of lateral boundaries of subsurface VOC contamination
- provide data to assist in the siting of soil borings and groundwater monitoring wells
- identify potential source areas

For each subfacility the soil vapor survey will consist of the collection of soil vapor samples on a 20 foot grid system. Based on actual field conditions, the soil vapor probe survey may follow the grid of installed utilities if those utility pathways appear to be acting as a conduit for the migration of contaminants.

The direction and extent of the survey will be based on and evaluated by interpreting elevated levels of VOC's identified during the initial sampling locations. Two grid points with non-detectable concentrations of target compounds in all prime directions will complete the soil vapor survey along the respective grid line direction.

The soil vapor samples will be collected per the methodology in Section V of this Plan; Sampling and Analysis Plan.

Soil Vapor Sample Analysis: Soil vapor samples will be analyzed according to EPA method 602 or other methods approved by Ecology. All soil vapor samples will have a VOA scan run.

Tabulated results of the laboratory analysis for vapor samples shall be reported in micrograms per liter (ppb) of air. Separate site maps contouring each contaminant will be submitted to Ecology as part of the soil vapor assessment. In

addition, the following information will be submitted in the report:

- discussion of equipment applicability
- discussion of equipments' limitations and problems
- discussion of field procedures
- discussion of laboratory procedures
- discussion and interpretation of the results
- identification of proposed soil boring locations

The failure to find soil gas contaminants at any subfacility does not preclude Ecology from requiring soil sampling and/or the installation of groundwater monitoring wells.

TASK 2: Soil/Groundwater Investigation and Analysis.

A. Soil Borings

Soil borings shall be installed to assist in the collection of soil samples, characterize subsurface contaminants, characterize the subsurface soils/geology, and/or for the installation of groundwater monitoring wells.

Soil borings will be installed in areas of significant contamination based on the interpretation of the existing site data and soil gas survey results. Unless otherwise approved by Ecology, soil boring depths will be at least from 20 to 25 feet deep or until groundwater is encountered. This may vary dependent upon subsurface conditions and also if the boring will ultimately be used for a monitoring well.

The PLP shall be responsible for utility surveys prior to beginning drilling activities. Proposed soil boring and monitoring well locations will be submitted to Ecology for review/approval. Such locations will be based on the soil vapor assessment results and the site history. After Ecology approval of these locations, and a utility search, soil boring activities may commence. Boring locations will be flagged on the ground prior to drilling. These drilling locations will not be relocated more than five feet without Ecology's review and approval.

B. Soil Sampling

The objective of soil sampling is to gather enough analytical data to characterize the extent of soil contamination at each subfacility. Based on the results of the soil vapor assessment, samples at varying depths will be taken from each soil boring proposed above. For each boring, samples will be taken at 2', 5', 10', and just above the groundwater level or at completion depth. The total number of soil samples per subfacility will be dependent upon the total number of soil

borings required at the subfacility. Based on the analyses of this initial round of borings, Ecology may require additional sampling. In such cases a work plan addendum will be submitted to Ecology proposing the location of these additional samples.

C. Soil Sample Analysis

Chemical: To assist in the characterization of subsurface soil and groundwater contamination, soil samples will be collected for chemical testing. For each of the soil samples collected at each subfacility, a series of chemical tests will be conducted. Figure 4 (Analysis Method by Media of Concern) shows each subfacility, the chemicals which will be tested for, and the lab method (EPA Method).

Physical/Other: Additional testing will be conducted to assist in the selection of alternatives in the Feasibility Study. Physical testing of soil samples will include; surface soil distribution, pH, moisture content, grain size/sieve analysis, SCS soil classification, hydraulic conductivity, bulk density, porosity, soil sorptive capacity, soil organic content, and particle size distribution. The subfacility will propose to Ecology the number of soil samples to receive physical testing.

Tabulated results of the laboratory analysis of soils samples shall be reported in ug/kg (ppb). Separate subfacility site maps contouring each contaminant will be submitted in the Remedial Investigation Report. In addition, the following information will be submitted:

- discussion of equipment applicability
- discussion of the equipments' limitations and problems
- discussion of field procedures
- discussion of laboratory procedures
- discussion and interpretation of the results

Soil Sample Collection Methodology: See Section V (Sampling and Analysis Plan).

D. Groundwater Investigation

Tetrachloroethylene contamination has been documented throughout the YRRA. The objective of the groundwater investigation is to characterize the extent of contamination at each subfacility. In addition, this information will ultimately be used in determining the feasibility of groundwater remediation.

Figure 4

Analysis Method by Media of Concern

Sub-Facility	Chemicals Category	Method Soil	Water
Fifth Wheel Truck Repair	Metals	EPA Method 7000 Series	EPA Method 7000 Series
	TPH	EPA WTPH 418.1	EPA WTPH 418.1
	VOA	EPA Method 8240	EPA Method 8240
		EPA Method 8260	EPA Method 8260
Frank Wear Cleaners	VOA	EPA Method 8240	EPA Method 8240
		EPA Method 8260	EPA Method 8260
Hahn Motor Company	TPH	EPA Method WTPH-D	EPA Method WTPH-D
	VOA	EPA Method 8240	
		EPA Method 8260	
Nu-Way Cleaners	BNA	EPA Method 8270	
	VOA	EPA Method 8240	
		EPA Method 8260	
Paxton Sales Corp			
	BNA	EPA Method 8270	EPA Method 8270
	Cyano acidic acid		Cyano acidic acid
	Cyanide	Cyanide	Cyanide
	Metals	EPA Method 7000 Series	EPA Method 7000 Series
	SVOC		Pulegone
	VOA	EPA Method 8240	EPA Method 8240
		EPA Method 8260	EPA Method 8260
Westco One Hour Mertinizing			

Groundwater Monitoring Wells: As discussed earlier, monitoring wells will be installed in select soil borings. The soil borings and subsequent monitoring well locations will be based on the results of the soil vapor survey. Proposed soil boring and monitoring well locations will be provided to Ecology as part of the soil gas survey results. On approval of these monitoring well and soil boring locations by Ecology, well installation/soil boring activities may commence.

A minimum of one upgradient and three downgradient wells will be installed at each subfacility. Upgradient monitoring wells will be used to provide data on potential off-site sources of groundwater contamination. The wells data, from both up and down gradient, will be used to provide information on specific subfacility geologic and hydrogeologic conditions, and contamination characterization.

Monitoring wells shall be completed and screened to a depth of at least five feet below the seasonal low aquifer water level, and at least two feet above the high level. Well construction will be per Minimum Standards for Construction and maintenance of Wells Chapter 173-160 WAC. Surge Block or Air Lift well purging will occur until water is clear with no sediments.

Groundwater Sample Analysis: Groundwater samples will be collected for laboratory analysis from all wells present at each subfacility. Groundwater samples will be submitted to an Ecology or EPA certified analytical lab. For the groundwater samples collected, Figure 4 shows the chemical categories which will be analyzed for, and the lab method (EPA Method).

General water quality parameters will be measured by field personnel during collection of groundwater samples. For each monitoring well the following information will be provided: pH, temperature, conductivity, and dissolved oxygen content.

Groundwater sampling methodology: See section V, Sampling & Analysis Plan.

Hydrologic Testing: To obtain information on the physical characteristics of the shallow aquifer underlying each subfacility, hydrologic testing will be performed. Data from these tests will be used in the Feasibility Study and/or evaluation of potential cleanup technologies. A pumping test will be necessary of sufficient duration and discharge to adequately stress the aquifer such that transmissivity and storativity may be determined for the subfacility. The PLP or their representative will present the specific methodology of the pumping test to Ecology for review and approval. If the circumstances at a subfacility prevent a pump test, other information sources may be used with prior Ecology approval.

Tabulated results of the laboratory analysis of soils samples will be reported in ug/kg (ppb). Separate subfacility site maps contouring contaminant will be submitted in the Remedial Investigation report. In addition, the following information will be submitted:

- discussion of equipment applicability
- discussion of equipments' limitations and problems
- discussion of field procedures
- discussion of laboratory procedures
- discussion and interpretation of the results

E. Data Evaluation and Presentation

The PLP shall analyze all subfacility investigation data and prepare a report about the type and extent of contamination including, but not limited to:

-- Nature of contamination
-- Extent of contamination, including the volume of soil and water needing remediation
-- Pathways by which contamination has or can reach the media
-- Known or potential hazards to the public health, welfare, and the environment, including physical hazards
-- Recommendations for further investigations, a Feasibility Study, and the need for interim actions.

All sample results will be provided to Ecology on diskette and as hard copy in the Remedial Investigation report. Data submitted on diskette will be submitted according to protocol found in Attachment A: Sampling Data Submittal Requirements (A diskette is available from Ecology).

At a minimum, all YRRA subfacilities will submit the following from the gathered data:

- water level data in hydrographs
- water level contour maps
- hydrogeologic cross-section for the subfacility
- contaminant contour maps (both soil and groundwater)
- soil boring logs

Please indicate if maps, etc., are hand or computer-generated, and if the latter, what the computer software program is.

F. Timelines for Accomplishing RI

This Remedial Investigation workplan will be implemented in accordance with the schedule shown in Figure 5. This schedule shows the submittal dates for each phase of the work plan.

Figure 5. Schedule for Remedial Investigation Deliverables

	Deliverable	Day Number
(1)	Commence work under Agreed Order or Enforcement Order (date Order is signed by Ecology)	Day 1
(2)	Commence work on RI Task 1a Site History/Soil Vapor Assessment	Day 30
(3)	RI Task 1a completed Draft Site History/Soil Vapor Assessment completed; proposed sampling locations submitted by the PLP to Ecology	01-25-95
(4)	RI Task 1b completed Final Site History/Soil Vapor Assessment completed	02-15-95
(5)	Commence work on RI Task 2 Field soil/groundwater investigation and analysis	03-25-95
(6)	Task 2 completed and submitted	05-25-95
(7)	Task 3a completed; Draft Remedial Investigation (RI) submitted to Ecology	06-25-95
(8)	Task 3b completed; Final Remedial Investigation (RI) submitted to Ecology	09-30-95
	Total	365 days from date of this order

Total time for items (1) - (8) should not exceed 365 days

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The schedule includes anticipated activities through completion of the final Remedial Investigation Report. The timeframe for Remedial Investigation completion (includes report) at each subfacility is expected to be completed wit 18 months. Area wide investigations will take longer.

G. Final RI Submittal Requirements

Unless arrangements are made with Ecology prior to commencement of remedial investigation activities, all reports, plans, specifications and similar information will prepared and submitted according to WAC 173-340-840:

(1) Cover letter. Include a letter describing the submitta and specifying the desired department action or response.

(2) Number of copies. Three copies of all plans or reports shall be submitted to the Ecology Project Manager for the subfacility. The department may require additional copies meet public participation and interagency coordination nee

(3) Certification. All engineering work submitted under t chapter shall be under the seal of a professional engineer registered with the State of Washington.

(4) Visuals. Maps, figures, photographs, and tables to clarify information or conclusions shall be legible. All maps, plan sheets, drawings, and cross-sections shall meet following requirements:

(a) To facilitate filing and handling, be on paper no larger than 24 x 36 inches and no smaller than 8 1/2 x 11 inches. Photo-reduced copies of plan sheets may be submitted provided at least one full-sized copy of the photo-reduced sheets are included in the submittal.

(b) Identify and use appropriate and consistent scales to show all required details in sufficient clarity.

(c) Be numbered, titled, have a legend of all symbols used, and specify drafting or origination dates.

(d) Contain a north arrow.

(e) Use United States Geological Survey datum as a basis for all elevations.

(f) For planimetric views, show a survey grid based on monuments established in the field and referenced

2. Split sampler will be opened.

3. Sample recovered will be measured.

4. Soil from the barrel will be transferred from sampler to appropriate sample container(s). The sample will be labeled and secured in an iced cooler.

5. Split sampler will be decontaminated according to procedures in Section V.

In the event that a split spoon sampler proves unusable, soil samples may be collected through the use of a backhoe and hand sampling. Ecology approval must be obtained prior to the use of a backhoe for sampling.

D. Groundwater Monitoring Wells

Drilling/Installation: Groundwater monitoring wells will be constructed utilizing a method approved by Ecology prior to commencement of drilling. For each groundwater monitoring well the geologic and hydrogeologic conditions will be characterized. Methods of characterization will include:

- regular examination of the drill cuttings removed from the boreholes
- obtaining driven soil samples
- observing the resistance to drilling, indicated by drilling rig behavior and rate
- depth to water measurements taken during drilling

Where practical, split spoon samples will be collected from the well boreholes at depths of 2', 5', 10', and just above the ground water level or completion depth. Samples will be collected by driving a split barrel sampler into the subsurface. The sampler will be driven 24", if possible, into the undisturbed soil ahead of the borehole bottom.

Drilling and sampling shall be monitored by a qualified geologist, or hydrogeologist. Soils will be described in the field and classified in accordance with the unified Soil Classification System. Physical property testing will be completed on one sample from each geologic unit found at the subfacility. Physical property analysis will include porosity, grain size, and moisture content.

All wells shall be constructed to meet the requirements of Chapter 173-160 WAC. Construction shall be completed by a well driller licensed by the State of Washington.

to state plane coordinates. This requirement does not apply to conceptual diagrams or sketches when the exact location of items shown is not needed to convey the necessary information.

(g) Where grades are to be changed, show original topography in addition to showing the changed site topography. This requirement does not apply to conceptual diagrams or sketches where before and after topography is not needed to convey the necessary information.

(h) For cross-sections, identify the location and be cross-referenced to the appropriate planimetric view. A reduced diagram of a cross-section location map shall be included on the sheets with the cross-sections or on a separate sheet.

(5) Sampling data. All sampling data submitted shall be consistent with procedures specified by the Department.

(6) Appendix. This should include: A complete citation of references; applicable raw data; a description of, or where it is readily available, reference to testing and sampling procedures used; relevant calculations; and any other information needed to facilitate review. In addition, this will include the following:

(a) General field observations including:

-- Groundwater characterization, including potentiometric maps and data related to all hydraulic testing;

-- Location of nearby wells and well log information;

-- Soil conditions including locations, descriptions and photographs of soil borings;

-- Well driller and hydrogeologist logs/observations;

(b) Changes from the sampling plan, including opportunity samples and other changes.

(c) Sample location map, legibly superimposed on a subfacility map, including sample media and sample numbers.

(d) Table of principle facts related to sampling and analysis results.

V. Sampling & Analysis Plan

A. Purpose

The purpose of the RI is to provide data of sufficient quality and quantity to determine the nature/extent of contamination at the subfacility and to evaluate potential remedial actions. Within the YRRA, subfacilities have varying pathways for potential migration of constituents: air, soil, groundwater, and possibly surface water. This sampling and analysis plan presents the technical approach and procedures to be used in completing the RI. Field investigation activities and sampling procedures are presented here in detail.

B. Soil Vapor Sampling Procedures

To collect soil vapor samples, a hollow drive rod will be advanced to depths of between 3 to 10 feet. Where pavement or cement is present an electric hammer drill will be used to penetrate to underlying material. The sampling system will then be purged by evacuating 2-5 probe volumes of gas (air). Following this, another sampled volume of soil gas will be drawn through the probe and encapsulated in the pre-evacuated sample container attached to the system.

At the start of each days sampling all sampling equipment, including drive rods and probes, will be decontaminated and purged prior to sampling (See Section V). Field control samples will be collected at the beginning and end of each days sampling and after every 15th soil vapor sample. These quality control samples will be obtained by filtering ambient air through a dust and organic vapor cartridge, and collecting them in the same manner as above.

C. Soil Sampling

Physical Properties Testing: Soil samples selected for physical property analysis will be based on the geologic variability observed in the field during drilling. A minimum of two samples will be selected from each geologic unit. Samples will be analyzed for porosity, grain size, moisture content, and specific gravity.

Samples for Chemical Analysis: Soil samples will be collected by driving a split spoon sampler. The sampler will be driven 18-24 inches where possible into undisturbed soil ahead of the drill pipe. To collect samples the following procedure will be used:

1. Driller will retrieve split sampler from borehole and give to the PLP representative.

2. Split sampler will be opened.

3. Sample recovered will be measured.

4. Soil from the barrel will be transferred from sampler to appropriate sample container(s). The sample will be labeled and secured in an iced cooler.

5. Split sampler will be decontaminated according to procedures in Section V.

In the event that a split spoon sampler proves unusable, soil samples may be collected through the use of a backhoe and hand sampling. Ecology approval must be obtained prior to the use of a backhoe for sampling.

D. Groundwater Monitoring Wells

Drilling/Installation: Groundwater monitoring wells will be constructed utilizing a method approved by Ecology prior to commencement of drilling. For each groundwater monitoring well the geologic and hydrogeologic conditions will be characterized. Methods of characterization will include:

- regular examination of the drill cuttings removed from the boreholes
- obtaining driven soil samples
- observing the resistance to drilling, indicated by drilling rig behavior and rate
- depth to water measurements taken during drilling

Where practical, split spoon samples will be collected from the well boreholes at depths of 2', 5', 10', and just above the ground water level or completion depth. Samples will be collected by driving a split barrel sampler into the subsurface. The sampler will be driven 24", if possible, into the undisturbed soil ahead of the borehole bottom.

Drilling and sampling shall be monitored by a qualified geologist, or hydrogeologist. Soils will be described in the field and classified in accordance with the unified Soil Classification System. Physical property testing will be completed on one sample from each geologic unit found at the subfacility. Physical property analysis will include porosity, grain size, and moisture content.

All wells shall be constructed to meet the requirements of Chapter 173-160 WAC. Construction shall be completed by a well driller licensed by the State of Washington.

All wells shall be developed by sufficient purging of a minimum of four casing volumes. This will consist of surge block or air lift until well water is clean/no sediments.

E. Groundwater Sampling

The following field procedures will be adhered to throughout the YRRA sampling program.

Depth to Water Measurements: Prior to well development and purging, water depths will be measured to the nearest 100th of a foot (.01) using a decontaminated electric water level sounder. A control point for measuring water depth will be established on the well casing.

Purging: After initial measurements have been recorded, monitoring wells will be purged. During purging, temperature, pH, and electrical conductivity will be monitored and recorded. Indicator parameters will be considered stabilized when three successive measurements, in 5 gallon increments, vary less then 10 percent. A minimum of 4 casing volumes will be removed during purging.

Sample collection: Groundwater samples will be collected using a dedicated bailer suspended by a nylon cord. The bailer will be lowered slowly into the water, retrieved, and emptied slowly to avoid degassing the sample. The cord will be discarded after collecting each sample. The sample will then be handled according to the procedures in Section VI.

Decontamination: All sampling equipment will be decontaminated between each sampling in accordance with procedures in Section V.F. It is expected that individual bailers or pumps will be dedicated to each well, or that disposable bailers will be utilized.

F. Equipment Decontamination

The main objectives of equipment decontamination are:

-- contain all contaminated materials in such a manner that work performed for the RI does not cause the spread of any hazardous constituents within or off the site.

-- decontaminate sampling equipment such that cross contamination does not occur between drill holes or samples.

A decontamination area will be established for all sampling events. All decontamination will be performed in such a manner as to enable the capture/containment of the rinsate.

Drilling Equipment: Drilling equipment, including drill rod and casing, will be decontaminated prior to and after each use. Steps for this will be as follows:

1. Scrape any large chunks of soil or debris away.
2. If oil is visible, an appropriate cleanser will be used to cut or dissolve oil from equipment.
3. Drilling equipment will be thoroughly washed with a high-pressure steam cleaner/pressure washer.

Soil Sampling Equipment may be decontaminated by one of two methods. (1) By high-pressure steam cleaner/pressure washer with the rinsate caught and then contained, or (2) a series of four clean buckets on plastic/visqueen at each drilling location. First bucket will be clean potable water, second bucket will contain clean potable water with Alconox or equivalent, third bucket will contain clean potable water, and fourth bucket will contain clean deionized/distilled water. Water in wash buckets will be changed between each sampling location. A blank sample of the deionized water used in each sampling event shall be taken and analyzed (see QA/QC).

All sampling equipment will be decontaminated before and after each sampling event. Steps are as follows:

1. Rinse in potable water.

2. Wash in Alconox or equivalent soap and potable water. Nylon pads, bottle brushes may be used to facilitate washing if needed.

3. Rinse in potable water

4. Rinse in deionized/distilled water.

5. Air dry equipment, if possible, between sampling.

Water Sampling Equipment: Utilize the same means as described for soil sampling equipment.

Waste Disposal: Solid and liquid wastes generated during sampling will be disposed of as appropriate depending upon contamination levels and source. It is the responsibility of the sampler to identify appropriate disposal.

G. Data Submission Requirements:

Logs will be kept of all on-site activities conducted under this workplan. This will include Field Investigation Daily

Report, Well Development Records, Well Drilling/Installation Log, Soil Sampling Record, Groundwater Sampling Record, and Water Level Measurements.

A summary of the month's activities shall be submitted by the PLP to the Ecology Site Manager on the last day of the month. It shall briefly discuss the various Remedial Investigation task activities accomplished, problems encountered, and problems anticipated. A separate letter must be sent for Ecology consideration of any change in procedure or schedule in the Remedial Investigation.

All data will be submitted to Ecology per the requirements of Chapter WAC 173-340-840. In addition, data will be submitted on diskette per the format in Attachment A: Electronic Data Submittal Requirements.

VI. Quality Assurance/Quality Control Project Plan

A. Objective

The main objective of quality assurance/quality control is to develop and implement procedures which provide data of known and acceptable quality. The quality of the data to be gathered under this work plan will be assessed against the following criteria:

Representativeness: The measure of how closely the measured results reflect the actual concentration or distribution of the chemical compounds in the soil, air, or water sampled. Sampling plan design, including the number and location of samples, sampling techniques, and sample handling protocols (storage, preservation, and transportation) has been developed to provide data that are representative of the matrix samples. Documentation will be submitted as part of the RI report to establish that protocols have been followed and sample identification and integrity assured.

Comparability: Comparability of data is essential so that all information gathered at subfacilities within the YRRA can be compared and utilized. Data comparability will be maintained by use of consistent methods, detections limits, and units. These specific requirements have been identified in various sections of this work plan. Any deviations from this must have prior Ecology approval.

Accuracy: Accuracy is an assessment of the closeness of the measured values to the true values. Accuracy of chemical tests is assessed by spiking samples with known standards and establishing the average recovery, and by analyzing known standards and calculating the percent difference between the measured value and the known value of the standard.

Precision: Precision is the measure of the analytical systems ability to be reproducible. For duplicate measurements, precision can be expressed as the relative percent difference.

Completeness: Completeness is the measure of the amount of valid data obtained from the analytical measurement system. This may be defined as the ratio of the number of valid samples collected to the total number of samples collected in the field. For the laboratory, this may be defined as the ratio of the number of samples measured for a specific analyte which meets quality assurance goals to the total number of samples measured for a specific analyte. Target completeness will be 90 percent and will be reported as part of the sampling data.

B. Sample Collection Procedures

The quality of the data collected in an environmental study depends upon the quality of sampling activities. Field operations must be well conceived, carefully implemented, and completely documented. This workplan provides a detailed description of the work to be performed. To ensure that appropriate QA/QC occurs, the subfacility must provide Ecology documentation of field quality control samples, sampling containers to be used, preservations, and holding times. Such documentation shall include the use of rinsate samples, and blind duplicates. The proposed QA/QC shall be provided to Ecology for approval prior to sampling activities.

At a minimum the QA/QC will discuss the following: Analytical Procedures, Chemical Analyses/Detection Limits, Timeliness, Reagent Blanks, Matrix Spikes and Matrix Spike Duplicates, Surrogate Spikes, Data Validation, and QA Audits.

C. Custody/Shipping Plan

1. Objective

To establish chain-of-custody procedure for sample processing from collection through shipping.

2. Background

Sample custody procedures include inventory and documentation during sample collection, shipment, and laboratory processing. A sample is considered in one's possession if the sample is:

* In the physical possession or view of the responsible party, or
* Secured to prevent tampering, or
* Placed in a restricted area by the responsible party

Chain-of-custody in the field is established by unique identification of samples using sample labels, followed by recording of sample disposition data on chain-of-custody forms. The transfer of samples from the field to the laboratory and through the testing process is documented using chain-of-custody procedures.

3. Personnel Required and Responsibilities

The Field Operations Manager is responsible for ensuring that field personnel have been trained in the use of this procedure and for verification that sample custody procedures are in accordance with this procedure.

4. Equipment Required

* Sample labels & Indelible ink pens
* Sample Data & Analysis Required forms
* Sample Log form
* Request for Analysis form
* Custody Seals

5. Procedure

Sample Numbers

1. Sample vial label may be attached to sample vial either at sample collection time or in advance.
2. Assign a unique sample number to each sample collected in the field (may be done in advance).
3. Upon obtaining the sample, record the sample number and other required information on the:
   a. Sample label.
   b. "Sample Data & Analysis Required" form.
   c. Sample Log form.
4. When a cooler is ready for shipment to Manchester Laboratory (Ecology) or other acceptable laboratory, the following documents shall be sealed in a plastic bag and taped inside the lid of the cooler containing the samples:
   a. Request For Analysis
   b. Sample Data & Analysis Required

Overnight Storage/Transport to Laboratory

Should overnight storage of sample containers be necessary, PLPs or their representatives shall assure that coolers containing the sample vials are stored in a secured area. For Ecology's sampling events, sample vials shall be stored in a locked vehicle inside the secured and restricted Ecology parking area at 106 South 6th Avenue in Yakima. The coolers within the vehicles shall also be sealed with a Custody Seal. Coolers shall be similarly sealed during transport to Manchester Laboratory.

Chain of Custody Record

The Chain of Custody Record represents the official documentation for all transfers of sample custody until the samples have arrived at the laboratory. Chain of Custody Record is used to document the integrity of samples.

When relinquishing custody of samples, sign the "Chain of Custody Record" section within the "Sample Data & Analysis Required" form. The individual receiving the samples will do the same.

VII. Health and Safety Plan

Purpose

This Health and Safety Plan provides policies and procedures to protect Ecology personnel from the potential hazards posed by work at the Yakima Railroad Area and its subfacilities. The Health and Safety Plan provides measures to minimize potential exposure, accidents, and physical injuries which may occur during daily on-site activities and during adverse conditions. Steps to be taken during emergencies are also provided.

This Health and Safety Plan was developed by Ecology for Ecology employee use. The plan consists of two parts: 1) Integrated Health and Safety Policy for HWICP Field Employees, and 2) a site specific or Assignment Specific health and Safety Plan. Part 1: The Integrated Health and Safety Policy for HWICP Field Employees is available at the Ecology Yakima Regional Office. Part 2: follows with site specific information regarding the YRRA and its subfacilities.

Site specific Health and Safety Plan

A. General Information

Site Name: Yakima Railroad Area (YRRA)

Address\Facility Description: In general the YRRA area is bound northerly by Lincoln Avenue; easterly by the irregular trace of 4th Street to Pacific Avenue; 10th Street to Nob hill Boulevard; Rudkin Road to Valley mall Boulevard; a line running due south from the southern end of Rudkin road to the point where it intersects a line running due east from the eastern end of Ahtanum road; and westerly by the irregular trace of 3rd Avenue to West Washington Avenue and 8th Avenue to Summitview Avenue; then Pierce Street to Lincoln Avenue (northern boundary).

Subfacility Addresses:

Fifth Wheel Truck Repair
307 East Arlington
Yakima, WA 98901

Frank Wear Cleaners
106 South Third Street
Yakima, WA 98902

Nu-Way Dry Cleaners
801 South Third Street
Yakima, WA 98901

Hahn Motor Company
1201 South First Street
P.O. Box 382
Yakima, WA 98907

Paxton Sales Corporation
108 West Mead Avenue
Yakima, WA 98901

B. Emergency Contacts

- Fire: 911
- Police: 911
- Medical Aid: 911
- Ecology Health & Safety Officer:
  Mark Layman 454-7829
- Ecology Site Manager: Rick Roeder 454-7837
- Nearest Hospital: Memorial Hospital 575-8100
  2811 Tieton Drive, Yakima

  St. Elizabeth Hospital 575-5000
  110 S. Ninth Avenue, Yakima

Figure 2 shows the location of the medical facilities in the Yakima Railroad Area.

C. Site Activities

The objective of site activities for the YRRA and its subfacilities is to complete the Remedial Investigations and Feasibility Studies. This is followed by cleanup actions.

- **work zones:**

See Section II.

- **ingress and egress routes:**

Arrive at and depart from sampling locations through public roads/streets. For the subfacilities, ingress and egress routes will be common access roads, driveways, and alleys.

- **areas of suspected contamination:**

The major contaminant of concern for the YRRA is PCE or Perc (Tetrachloroethylene) in soils and groundwater. The PEL (Permissible Exposure Level) for PCE is 100 ppm.

For the remainder of the YRRA, ground water is suspected to be potentially contaminated with Tetrachloroethylene at concentrations which exceed the Drinking Water Limit of 5 ppb. Soils are also suspected to be potentially contaminated with Tetrachloroethylene at varying levels.

- **location of emergency equipment:**

A first-aid kit and fire extinguisher will be located at the on-site state vehicle. These vehicles are to be driven only by Ecology employees and will be at the sampling location at all times until completion of the sampling activity.

- monitoring equipment used:

Photovac TIP meter

- decontamination procedures

Decontamination procedures may be by washing/rinsing in sequential buckets or by steam cleaning. If washing is by sequential buckets, the equipment will include scrub brushes, a TSP (Tri Sodium Phosphate) cleaner (for equipment only), a portable sprayer filled with water, and disposal containers for contaminated clothing and equipment.

If decontamination is by steamcleaner, an appropriately lined area shall collect the rinse water. It will then be adequately collected and stored in containers.

In the case of employee contamination, the contaminated clothing will be removed, and any contaminated areas of the employee will be cleaned by soap pump container and flushed with water as necessary.

D. Health & Safety Hazards

Toxic Hazards/Air Monitoring

Sample locations will be throughout the YRRA. It is anticipated that potential exposure resulting from inhalation of volatile organic compounds (VOCs) is extremely minimal. A Photovac TIP meter will be carried by each sampling team and team members will be alert to potentially dangerous warning signs, such as strong odors, and irritating vapors which may prompt an immediate air measurement.

In the case of any Photovac TIP meter reading in excess of 200 ppm, all employees will evacuate the sampling area. Subsequent work will require the use of respirators.

Physical Hazards

The potential physical hazards listed below will be discussed with personnel prior to commencing field activities. Site personnel will be briefed to be constantly on the lookout for potential physical safety hazards. Physical hazards that may be encountered include:

- Animals and Insects

  Some animals and insects can and will bite if disturbed. Avoidance is the best solution to this potential problem.

- Existing Objects or Terrain

  Existing objects or terrain can present safety hazards in the form of:

  - Holes and ditches
  - Sharp objects such as nails, broken glass, and lumber
  - Slippery surfaces

- Fire and Explosion

  The most likely cause of fire or explosion on site would be the introduction of an ignition source into an explosive or flammable environment. This is an extremely remote possibility during this sampling program. Air monitoring equipment will give an indication before a LEL is reached. Field personnel will be advised that smoking is prohibited.

- Cold Stress/Heat Stress

  Cold temperatures, light to strong winds, and rain can be expected. Adequate protective clothing to ensure warmth will be necessary. Work and break schedules will be set depending on the ambient weather conditions.

- Acid Burns

  Severe burns may result from contact with 1+1 HCl preservative solution. **Extreme caution** shall be used when handling. Latex gloves and/or Nitrile gloves and goggles shall be appropriately utilized. Decontamination will be per decontamination procedures stated earlier in this Section.

- Other Physical Hazards

  Other physical hazards associated with the fieldwork in this remedial investigation may include: disturbance of underground utilities; noise produced during drilling; contact hazards associated with drilling including tripping, falling, or slipping.

E. Level of Protection Required

Level D protection will be utilized for the YRRA and its subfacilities. Elevated concentrations of organics or other contaminants may necessitate upgrading to Level C.

F. Personal Protective Equipment

The following personal protective equipment will be worn by personnel working on this sampling effort:

PP Equipment	Tasks Requiring
Safety Shoes/Boots (steel toe and shank)	All
Hard Hat	Around piping, or areas where head, facial "bumping" potential exists
Nitrile Gloves	**Sampling (optional)**
Latex Gloves	Sampling
Safety Glasses	Sampling

The above is suitable for Level D sampling

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In the unlikely event that Level C sampling is necessary, required additions to the above Level D requirements will be:

- respirator with organic vapor cartridge (GMC-H)
- poly-coated Tyvek or Tyvek/Saranex over personal garments
- nuke boots or boot covers
- latex and nitrile gloves

Also, Level C sampling must be conducted with a minimum two person team.

All personnel involved in sampling activities in which the potential for chemical exposure or physical exertion exists must be enrolled in the Ecology Medical Monitoring Program and have completed their 40 hour Health & Safety Training Course.

This plan shall be in the possession of field personnel and readily available at each sampling location.

G. Safety meetings

A presampling meeting shall occur to review the contents of this Health and Safety plan. All field participants and observers must read this plan and sign a certification stating that they agree to comply with all the Plan conditions.

H. Toxics Cleanup Program Safety Plan

In addition to the requirements of this YRRA site Health and Safety Plan, Ecology employees working in activities associated with the YRRA will meet the requirements of the Toxics Cleanup Program Safety Plan. This Plan is available at the Ecology office, 106 S. 6th Ave, Yakima, WA, 98902.

ATTACHMENT

'B'

January 27, 1993

TO: Persons Collecting Ground Water and Other Data at MTCA Sites

FROM: Carol Fleskes, Program Manager
Toxics Cleanup Program

SUBJECT: Cleanup Information No. 91-1: Ground Water, Soil, Sludge, and Sediment Data (Environmental Data)

Purpose

The purpose of this memorandum is to establish consistency and procedures for organizing, reporting, transmitting, and storing and retrieving surface water, ground water, soil, sludge, and sediment data (environmental data). These procedures will improve Ecology's ability to cleanup contaminated sites by making meaningful data readily available to the public, legislature, management, project managers, and site workers.

Applicability

These procedures apply to all environmental data collection activities required by the Model Toxics Control Act and Regulations. Exceptions may be made for low risk sites as determined by the Ecology project manager.

Background

Currently, very little of the environmental data collected for the state at toxic cleanup sites is available in a readily usable form. With only a few exceptions, these data are submitted to the department in the form of voluminous paper reports. This form precludes the staff from performing rapid, accurate and many times meaningful analysis of spacial and temporal trends of the data. In addition, the evaluation of environmental data cannot always be effective because of missing and/or improper pertinent information.

This procedure establishes appropriate methods to ensure that data submitted to Ecology is encoded, stored, and presented in a magnetic media format (diskette) so that data can be consistently used by our staff. This procedure will reduce data analysis time when compared to using laborious, time consuming hand methods of the past. Today, at most of the larger sites and many of the smaller sites, these data are processed using computers by the PLP's and consultants. This procedure will generally require the data be rearranged and in some cases additional data items collected.

The results of receiving digital data in a consistent manner will allow exchange of environmental data with EPA and between Ecology programs. This format is a super set of that developed by EPA. It is being used by other Ecology Programs.

Standardization of the data will mean that a broad range of computational, statistical, graphical and modeling software will be readily available to summarize and analyze the data. Standardized report will be available for the first time in the program.

Responsibilities

The attached procedures shall be required for all of the environmental data collection activities as follows:

- Directly by TCP
- By any contractors or consultants tasked by TCP
- By "potentially liable parties" acting under terms of a consent decree or order

Implementation of the procedures shall be by incorporation of the appropriate language into contracts, work plans, orders, consent decrees or other appropriate documents by the site project manager or contract officer.

Data shall be entered into the Ecology data base by a data administrator. There is an inter-program team that established new parameters. At this time, Bill Myers at headquarters is acting in this capacity and as the TCP representative to the team.

Depending on the availability of a wide area network, the data would be directly or indirectly available to staff and other data users. At this time, the Site Cleanup Section is developing links from the present data base program to other statistical, graphical and analytical software packages.

Also attached is a model letter which is sent, along with a diskette, to anyone using our format to submit environmental data. These diskettes are also available to staff. To obtain a copy call Bill at the telephone number shown on the letter.

KC:
Attachments

SITE DESCRIPTION AND SAMPLE DATA SUBMITTAL REQUIREMENTS

1. Media

Required data must be submitted on MS-DOS[1](version 5) or compatibly formatted diskettes. The diskettes may be 5 1/4 inch (or 3 1/2 inch) either: double sided, double density; or double sided, high density.

2. Data Formats

The SITE DESCRIPTION FILE, FIELD SAMPLE FILE and the LABORATORY SAMPLE FILE are quote, comma delimited ASCII files used as the standard format for transferring sample data to and from Ecology (LOTUS WK1 files and Ashton Tate DBF files may be substituted for ASCII files). The files will include the fields in the format and order listed (C=Character, N=Numeric, D=date[Character may be substituted in non DBF or WK1 format]).

The following Appendices are attached to standardize information entered into required files (see following appendices):

A. Matrix Codes

B. Sample Source Codes

C. Collection Method Codes

D. Chemical Data Dictionary (Standardizes Spelling, STORET P-codes., etc entered into the SAMPLE ANALYSIS FILE.

E. Laboratory Qualifiers

F. State Plane Zones (N or S)
(NOTE: Copy of RCW 58.20 provided for reference)

G. County Fips Codes

H. Hydrologic Unit Map

3. Submittal

Computer diskettes containing the SITE DESCRIPTION FILE, FIELD SAMPLE FILE and/or the LABORATORY SAMPLE FILE, clearly labeled for Project and Originator shall be submitted in duplicate, along with a backup hard copy of the diskette contents.

FIELD DEFINITIONS FOR SITE DESCRIPTION FILE

*Wells and Borings must include all Fields except as noted optional.
Underlined Fields are required for all stations.

FIELD	TYPE	WIDTH	DEFINITION
REP_DATE	D	10	Reporting date (mm/dd/yyyy).
REP_NAME	C	48	Reporting entity, data submitted by.
PRJ_NAME	C	48	Project, site, or facility name.
STA_TYPE	C	12	Station type (Ground water, Surface wtr, Sediment, Soil, Sludge, Biological or Air).
STA_USE	C	1	Well use (USGS codes) O-observation, W-water withdrawal, X-waste disposal, D-drain, T-test hole, E-geothermal, P-oil/gas, U-unused, R-recharge, Z-destroyed.
WTR_USE	C	1	Water use (USGS codes) W-water quality/level monitoring, D-dewatering, N-industrial, S-stock supply, B-bottling, I-irrigation, Q-aquaculture, U-unused, C-commercial supply, H-domestic supply P-public supply, J-industrial cooling, F-fire protection, Z-other.
DATA_REL	C	1	Data Reliability (USGS codes) C-field checked, L-poor location, U-unchecked.
STA_ID	C	12	Well ID number.
PRI_STA	C	15	Ecology primary station code. To be obtained from Ecology TCP.
SEC_STA1	C	12	Additional station code (previous well numbers, alternate or other well designations).
SEC_STA2	C	12	Additional station code (if any).
SEC_STA3	C	12	Additional station code (if any).
STATE_FIPS	C	2	State FIPS code (WA-53).

SITE DESCRIPTION FILE CONTINUED...

FIELD	TYPE	WIDTH	DEFINITION
COUNTYFIPS	C	3	County FIPS code (use state county code, Appendix F).
STATE_CHAR	C	2	State (WA).
COUNTYCHAR	C	16	County.
OWN_NAME	C	30	Monitoring well owner name.
OWN_DT	D	8	Date of ownership of well (mm/dd/yyyy).
OWN_ADD	C	60	Address of owner.
DRILLER	C	30	Name of Driller.
STA_DESC	C	48	Activity Site, Sample location, or Well location description (for example: "East of Bldg. 2" or "SE corner, intersection 6th & Seneca").
LOC_METHD	C	48	Method of determination of station location coordinates (Note: survey to known horizontal datum is required).
LAT	N	8	Latitude OPTIONAL (degrees-minutes-seconds-tenths).
LONG	N	9	Longitude OPTIONAL (degrees-minutes-seconds-tenths).
STPCO_NORT	N	12	Northerly state plane coordinates REQUIRED (nearest ft).
STPCO_EAST	N	12	Easterly state plane coordinates REQUIRED (nearest ft).
STPCO_ZONE	C	1	State plane coordinates: state plane zone REQUIRED (N or S).
LAND_NET	C	20	Land net location of well (Township, Range, Section, 1/4-1/4 Sec.). Use USGS 1/4-1/4 section alphabetic designator A through R OPTIONAL.

SITE DESCRIPTION FILE CONTINUED...

FIELD	TYPE	WIDTH	DEFINITION
UTM_NORTH	N	9	UTM grid system coordinates: North (meters) OPTIONAL.
UTM_EAST	N	8	UTM grid system coordinates: East (meters) OPTIONAL.
UTM_ZONE	C	2	UTM grid zone.
MAP_NAME	C	24	Name of USGS map and scale covering the sampling location(e.g., Yakima-100K, 1977).
BORE_DEP	N	8	Depth of original hole drilled if applicable (nearest 0.01 ft).
WELL_DEP	N	8	Well depth (nearest 0.01 ft).
WTR_ELEV1	N	8	Water level elevation at time of installation (nearest 0.01 ft).
WLEV_DAT1	D	10	Date of water level elevation measurement (mm/dd/yyyy).
MEAS_ELEV	N	8	Measuring point (reference point) elevation (nearest 0.01 ft).
MEAS_DESC	C	48	Measuring point description.
DATUM	C	48	Measuring point datum (The source of the altitude used to survey in the sampling location altitude i.e. City of Tacoma Sewer Survey 1921).
LEV_COMM	C	240	Comments, depth and water level data.
ALTITUDE	N	8	Approximate land surface elevation XXXXX.XX (ft) at the Station Location.
DEPTOWTR1	N	8	Water depth at time of install. (nearest 0.01 ft).
CONST_DT	D	10	Date of installation (mm/dd/yyyy).
MOREINT	C	1	More than one open interval (Y/N).

SITE DESCRIPTION FILE CONTINUED...

FIELD	TYPE	WIDTH	DEFINITION
UP_DEPTH	N	8	Depth to top of open interval (ft below measuring point).
LOW_DEPTH	N	8	Depth to bottom of open interval (ft below measuring point).
CONST_COMM	C	240	Comments, construction details.
MTD_CON	C	1	Method of construction (USGS WATSTORE codes) A-air rotary, B-bored/augured, C-cable tool, D-dug, H-hydraulic rotary, J-jetted, P-air percussion, T-trenching, V-driven, W-drive wash, R-reverse rotary, X-mud rotary, Z-other.
FILT_LEN	N	5	Length of filter pack (nearest 0.01 ft).
FILT_MAT	C	48	Type of filter pack material and size of material (e.g., Sand 200 mesh).
DIA_BOR	N	8	Boring diameter (in).
DIA_CAS	N	8	Casing diameter (in).
CAS_MAT	C	1	Casing material (USGS WATSTORE codes) B-brick, C-concrete, D-copper, F-teflon/fluorocarbon, G-galvanized iron, I-wrought iron, M-other metal, P-pvc/plastics, R-rock/stone, S-steel, T-tile, W-wood, U-coated steel, Z-other.
DIA_OPN	N	6	Diameter of open interval (in).
LEN_OPN	N	6	Length of open interval (nearest 0.01 ft).
TYP_OPN	C	1	Type of open interval (USGS WATSTORE codes) P-perforated/slotted screen, L-louvered/shuttered screen, S-screen (unknown type), F-fracture, R-wire wound, M-mesh, T-sand point, W-walled, X-open hole, Z-other.

SITE DESCRIPTION FILE CONTINUED...

FIELD	TYPE	WIDTH	DEFINITION
TYP_OMT	C	1	Material type, open interval (USGS WATSTORE codes) R-stainless steel, F-teflon/fluorocarbon, G-galvanized iron, P-pvc/plastic, B-brass/bronze, W-wrought iron, S-steel, T-tile, C-concrete, M-other metal, Z-other.
INT_COMM	C	240	Comments, open interval.
LOG_AVAIL	C	1	Well log data available? (Y/N).
TYP_LOG	C	10	Type of well log (USGS WATSTORE codes) A-time, B-collar, C-caliper, D-driller, E-electric, F-fluid conduction, G-geologist, H-magnetic, I-induction, J-gamma ray, K-dip meter, L-lateral log, M-microlog, N-neutron, O-microlateral log, P-photo/video, Q-radioactive, S-sonic, T-temperature, U-gamma gamma, V-fluid velocity, X-core, Z-other.
LOG_DOC	C	240	Log data source documents (e.g. Remedial Investigation Report).
OTHER_DOC	C	240	Other data source documents.
LOG_LOC	C	60	Location of well log (e.g. Ecology Southwest Regional Office).
AQUI_TEST	C	1	Aquifer testing performed (Y/N).
PUMP_DATA	C	240	Pump data such as: Type, Manufacturer, Horsepower, and depth set .
ANDAT_AVAL	C	1	Analytical or Statistical data available (Y/N).
PROGRAM	C	9	Ecology program (TCP, WQFA, WQ, other).
GEN_COMM	C	240	General comments.
HUCODE	C	8	See US Geological Survey Hydrologic Unit Map 1974-Washington.
AGN_USE	C	1	Agency use (USGS codes) A-Active, I-inactive, O-inventory only.

*** END OF SITE DESCRIPTION FILE ***

FIELD DEFINITIONS FOR FIELD SAMPLE FILE

*All Fields Required

FIELD	TYPE	WIDTH	DEFINITION
PRI_STA	C	15	Ecology Monitoring Well No. will be assigned by Ecology TCP Program.
STA_ID	C	12	Site well ID no. or other designation.
X_LOCATION Y_LOCATION	C C	12 12	Surveyed coordinates reported in the State Plane Coordinates (to the nearest foot).
STPLNZONE	C	1	N = North; S = South.
LO_DAT_U	C	5	Year of Reference datum either 1929 or 1983 and which system L Lat Long or S for State Plane Coordinate System.
LOC_DATUM	C	48	Reference datum from Map or survey e.g., 1983 North American Datum (see Appendix F, RCW 58.20)
DEPT_WATER	N	8	Depth to water (in 0.01 ft) at time of sampling.
UP_DEPTH	N	7	Depth (nearest 0.01 ft) to the top of the interval sampled (e.g. Top of well screen or core interval).
LOW_DEPTH	N	7	Depth (nearest 0.01 ft) to the bottom of the interval sampled (e.g. Bottom of well screen or core interval).
WTR_ELEV	N	8	Water level elevation (in 0.01 ft) at the time of sampling.
AGENCY	C	8	Agency requesting sampling data.
SAMPLE_DAT	D	8	Date of well sampling (mm/dd/yyyy).
SAMP_TIME	C	4	Time of well sampling in military time.
SAMPLE_ID	C	8	Sample ID code or no.

FIELD SAMPLE FILE CONTINUED:

FIELD	TYPE	WIDTH	DEFINITION
FILTERED Yes(Y) or	L	1	Was the sample field filtered? No(N)
ANALYSIS_MTHOD	C	15	EPA Analysis method descriptions (i.e EPA Method 601).
MEAS_ELEV	N	8	Surveyed elevation of the measuring point used to determine water level depths and elevations. (nearest 0.01 ft).
MEAS_DESC	C	48	Description of the well measuring point used (e.g., top of casing, file mark on casing, etc.).
DATUM	C	48	Vertical datum used to reference elevations (e.g., MSL and source/date of information).
MATRIX	C	2	Type of sample; water, sediment, soil, other (from Appendix A).
SOURCE_COD	C	2	Physical environment sampled (from Appendix B).
COLLECTMET	C	2	Collection method code (from Appendix C).
FIELD_PH	N	5	The pH value taken at time of sampling (e.g. 11.67)
FIELD_COND	N	7	The conductivity value in umhos.
FIELD_TEMP in	N	5	The field temperature of the sample degrees celsius.
PURGE_METH	C	1	Purging method: B = Bail, P= Pump
PURGE_VOL	C	2	Number of boring volumes removed prior to sampling (liquid).
PRJ_NAME	C	48	Project, site, or facility name.

*** END OF FIELD SAMPLE FILE ***

FIELD DEFINITIONS FOR LABORATORY SAMPLE FILE

*All Fields Required

FIELD	TYPE	WIDTH	DEFINITION
PRI_STA	C	15	Ecology Monitoring Well No. will be assigned by Ecology TCP Program.
STA_ID	C	12	Site well ID no. or other designation.
SAMPLE_DAT	D	8	Date of well sampling (mm/dd/yyyy).
ANALYZ_DAT	D	8	Date the sample was analyzed (mm/dd/yyyy).
SAMPLE_ID	C	8	Sample ID code or no.
LAB_NAME	C	10	Laboratory performing analysis.
LABSAMP_ID	C	10	Sample number assigned by the laboratory.
CONSTITUEN	C	30	Chemical constituent names as defined in Ecology's Chemical Dictionary (see attached Appendix D)
CAS_ID	C	12	Chemical Abstract Systems ID (see Appendix D).
P_CODE	C	5	STORET Parameter Code (see Appendix D).
RESULT	N	12	Detected chemical concentration result.
UNITS	C	10	Units of measurement (e.g., µg/Kg).
QUAL	C	4	Contract Laboratory Program chemical data qualifiers (such as U, J, R, UJ, etc.). Non-Contract Lab Program qualifiers, such as less-than signs ("<") orasterisks, are not acceptable (see Appendix E).
QA_QUAL	C	4	Qualifier associated with QA Review of Lab report (See Appendix E).
LIMIT	C	10	Lab instrument detection limit.

LABORATORY SAMPLE FILE CONTINUED:

FIELD	TYPE	WIDTH	DEFINITION
DILUTION	N	6	Amount the sample was reduced and diluted to accommodate analysis (i.e. 10X,20X).
FILTERED	L	1	Was the sample lab filtered? Yes(Y) or No(N)
ANALYSIS_MTHOD	C	15	EPA Analysis method descriptions (i.e EPA Method 601).
MATRIX	C	2	Type of sample; water, sediment, soil, other (from Appendix A).
PRJ_NAME	C	48	Project, site, or facility name.

*** END OF LABORATORY SAMPLE FILE ***

APPENDIX A: MATRIX CODES

10	Water-Total
11	Water-Dissolved
40	Sediment/Soil
45	Semi-Solid/Sludge
70	Sediment for EP Toxicity
80	Oil/Solvent
00	Other

APPENDIX B: SAMPLE SOURCE CODES AND DESCRIPTIONS

00	Unspecified source
01	Unknown liquid media (drum/tank)
02	Unknown liquid media (spill area)
03	Unknown liquid media (waste pond)
10	Water (general)
12	Ambient stream/river
13	Lake/reservoir
14	Estuary/ocean
15	Spring/seepage
16	Rain
17	Surface runoff/pond (general)
18	Irrigation canal/return flow
20	Well (general)
21	Well (industrial/agricultural)
22	Well (drinking water supply)
23	Well (test/observation/monitoring)
24	Drinking water intake
25	Drinking water (at tap)
30	Effluent wastewater (general)
31	Municipal effluent
32	Municipal inplant waters
33	Sewage runoff/leachate
34	Industrial effluent
35	Industrial inplant waters
36	Industrial surface runoff/pond
37	Industrial waste pond
38	Landfill runoff/pond/leachate
40	Sediment (general)
42	Bottom sediment of deposit
44	Sludge (general)
45	Sludge (waste pond)
46	Sludge (drum/tank)
48	Soil (general)
49	Soil (spill/contaminated area)
50	Bore hole material

Sample Source Codes and Descriptions
(continued)

60	Air (general)
61	Ambient air
62	Source of effluent air
63	Industrial or workroom air
64	Hi-vol filter
70	Tissue (general)
71	Fish tissue
72	Shellfish tissue
73	Bird tissue
74	Mammal tissue
75	Macroinvertebrate
76	Algae
77	Periphyton
78	Plant/vegetation
80	Oil/solvent (general)
81	Oil (transformer/capacitor)
82	Oil/solvent (drum/tank)
83	Oil/solvent (spill area)
84	Oil/solvent (waste pond)
90	Commercial product formulation
95	Well drill water
96	Well drill mud
97	Well sealing material
98	Gravel pack material

APPENDIX C: COLLECTION METHOD CODES

00	Unknown
10	Hand grab
11	Plastic bucket
12	Stainless steel bucket
13	Brass kemmerer
14	PVC kemmerer
15	D.O. dunker
16	DH 48/DH 49 Integrating sampler
17	Van Dorn bottle
18	Glass dip tube
19	Other
20	Automatic sampler (general)
21	ISCO auto sampler
22	Manning auto sampler
23	Hydrostar or similar pump
24	Submersible pump (electric)
25	Well point sampler (pump)
26	Stainless steel bailer (hand)
27	PVC bailer
28	Teflon bailer
29	Peristaltic pump
30	Dredge (unspecified)
31	Dredge (Peterson)
32	Dredge (Van Dorn)
33	Dredge (Van Veen)
34	Core
35	Freeze core
36	Bladder Pump
40	Macroinvertebrate (unspecified)
41	Picked by hand
42	Kick net
43	Surber
44	Modified Hess type sampler
45	Rock basket
46	Hester Dendy sampler
50	Fish (unspecified)
51	Fish (shocking)
52	Fish (netting)
53	Fish (hook & line)
54	Fish (poison)
60	Periphyton (unspecified)
61	Rock scraping
62	Glass slides

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
1,1,1,2-Tetrachloroethane	527.00	77562	630206	ug/L
1,1,1-Trichloroethane	1.00	34506	71556	ug/L
1,1,2,2-Tetrachloroethane	2.00	34516	79345	ug/L
1,1,2,2-Tetrachloroethene	75.05	34475	127184	ug/L
1,1,2-Trichloro2,2,1trifluoroethane	3.00	77652	76131	ug/L
1,1,2-Trichloroethane	4.00	34511	79005	ug/L
1,1-Dichloroethane	5.00	34496	75343	ug/L
1,1-Dichloroethene	6.00	34501	75354	ug/L
1,1-Dichloroethylene	6.01	34501	75354	ug/L
1,1-Dichloropropene	546.00	77168	563586	ug/L
1,2,3-Trichlorobenzene	534.00	77613	87616	ug/L
1,2,3-Trichloropropane	441.00	81610	96184	ug/L
1,2,3-Trinitrobenzene	85.00	73275	99354	ug/Kg
1,2,4-Trichlorobenzene	7.00	34551	120821	ug/L
1,2,4-Trimethylbenzene	536.00	77222	95636	ug/L
1,2,4-Trinitrobenzene	100.00			
1,2-Dibromoethane (EDB)	8.00	77651	106934	ug/L
1,2-Dichlorobenzene	9.00	34536	95501	ug/L
1,2-Dichloroethane	10.00	34531	107062	ug/L
1,2-Dichloromethane	68.01	34423	75092	ug/L
1,2-Dichloropropane	11.00	34541	78875	ug/L
1,2-Diethoxyethane	482.00	81527	629141	ug/L
1,2-Diethylbenzene	548.00	77340	135013	ug/L
1,2-Dimethylbenzene	77.02	77135	95476	ug/L
1,2-Dimethylhydrazine	582.00	73562	540738	ug/L
1,2-Diphenylhydrazine	84.00	34346	122667	ug/L
1,3,5-Trimethylbenzene	541.00	77226	108678	ug/L
1,3,5-Trinitrobenzene	156.00	73275	99354	ug/Kg
1,3-Dichlorobenzene	12.00	34566	541731	ug/L
1,3-Dichloropropene	544.00	34561	542756	ug/L
1,3-Diethylbenzene	549.00	77348	141935	ug/L
1,3-Dimethylbenzene	67.01	77134	108383	ug/L
1,4-Dichlorobenzene	13.00	34571	106467	ug/L
1,4-Diethylbenzene	550.00	77345	105055	ug/L
1,4-Dimethylbenzene	475.03	77133	106423	ug/L
1,4-Dioxane	583.00	82388	123911	mg/L
1-Methylethyl ester carbamic acid	574.00	73615	615532	ug/L
1-Methylnaphtalene	211.00	77418	90120	ug/L
2 Methoxy-5-nitroaniline	584.00	73622	99558	ug/L
2 Methylaniline	585.00	77142	95534	ug/L
2 Methylaniline hydrochloride	586.00	73649	636215	ug/L
2,2,4-Trimethylpentane	545.00		5408401	
2,2-Dichloropropane	547.00	77170	594207	ug/L
2,3,4,6-Tetrachlorophenol	1553.00	77767	4901513	ug/L
2,3,6-Trichloro benzeneacetic acid	575.00	85347		
2,3,7,8-TCDD	87.02	34675	1746016	ug/L

APPENDIX D: CHEMICAL DICTIONARY
01/27/93

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
2,3,7,8-Tetrachlorodibenzo-p-dioxin	87.00	34675	1746016	µg/L
2,3-Dichloropropylene	88.00	77166	78886	µg/L
2,4,5-T Methyl Ester	89.00	39740	93765	µg/L
2,4,5-TB	554.00	82650	93801	µg/kg
2,4,5-TP (Silvex)	91.00	39760	93721	µg/L
2,4,5-TP Methyl Ester	90.00			
2,4,5-Trichlorophenol	14.00	77687	95954	µg/L
2,4,5-Trichlorophenoxyacetic acid	319.00	39740	93765	µg/L
2,4,6-Trichlorophenol	15.00	34621	88062	µg/L
2,4,6-Trimethyl-1-1,3,5-Trioxane	92.00	77322	123637	µg/L
2,4-D	93.00	39730	94757	µg/L
2,4-D Methyl Ester	93.01	39730	94757	µg/L
2,4-DB (Water, Total)	555.00	38745	94826	µg/L
2,4-Dichlorophenol	16.00	34601	120832	µg/L
2,4-Dichlorophenoxy butyric acid	235.00		94826	µg/L
2,4-Dimethylphenol	17.00	34606	105679	µg/L
2,4-Dinitrophenol	18.00	34616	51285	µg/L
2,4-Dinitrotoluene	19.00	34611	121142	µg/L
2,4-Toluenediamine	587.00	78888	95807	µg/L
2,5-Dinitrotoluene	94.00	77637	619158	µg/L
2,6-Dinitrotoluene	20.00	34626	606202	µg/L
2-Butanone	376.03	81595	78933	µg/L
2-Chloroethyl vinyl ether	22.00	34576	110758	µg/L
2-Chloronaphthalene	23.00	34581	91587	µg/L
2-Chlorophenol	24.00	34586	95578	µg/L
2-Chlorotoluene	535.00	38680	95498	µg/L
2-Cyclohexane-1-one	488.00	930697		
2-Ethyl hexanoic acid	196.00	82114	149575	µg/L
2-Hexanone	25.00	77103	591786	µg/L
2-Methyl-2H-benzotriazole	576.00	85813	29385431	µg/L
2-Methyl-4,6-dinitrophenol	96.00	34657	534521	µg/L
2-Methyl-4-chlorophenoxyacetic acid	367.02	39151	94746	µg/L
2-Methyl-4-pentanone	95.00	78133	108101	µg/L
2-Methyl-p-cresol	17.01	34606	105679	µg/L
2-Methylnaphthalene	26.00	77416	91578	µg/L
2-Methylphenol	27.00	77152	95487	µg/L
2-Nitroaniline	28.00	30195	88744	µg/L
2-Nitrophenol	29.00	34591	88755	µg/L
2-Pentanone	97.00	77060	107879	µg/L
2-chloro-1-hydroxybenzene	24.02	34586	95578	µg/L
3,3'-Dichlorobenzidine	98.00	34631	91941	µg/L
3,3-Dimethoxybenzidine	588.00		119904	µg/L
3,3-Dimethylbenzidine	589.00	73580	119937	µg/L
3,4-Benzofluoranthene	99.00	34230	205992	µg/L
3,4-Dichlorobenzyl N-methylcarbamate	571.00		1966581	µg/L
3,5-Dichlorobenzoic acid	240.00		51366	µg/L
3-Chloro octane	528.00			

APPENDIX D: CHEMICAL DICTIONARY
01/27/93

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
3-Nitroaniline	30.00	78300	99092	µg/L
4,4'-DDD	208.01	39360	72548	µg/L
4,4'-DDE	209.01	39365	72559	µg/L
4,4'-DDT	210.01	39370	50293	µg/L
4,4-Methylene bis(n,n-dimethyl) an +	592.00	101611		µg/L
4,6-Dinitro-2-methylphenol	96.01	34657	534521	µg/L
4,6-Dinitrophenol	101.00	82226	88857	µg/L
4,7-Methanoisobenzofuran-1(3H) -one +	570.00			µg/L
4-Bromophenoxybenzene	102.00			
4-Bromophenyl phenyl ether	103.00	34636	101553	µg/L
4-Chloro-2-methyl analine hydrochl +	590.00		3165933	µg/L
4-Chloro-2-methyl aniline	591.00		95692	µg/L
4-Chloro-3-methylphenol	31.00	34452	59507	µg/L
4-Chloro-m-cresol	31.01	34452	59507	µg/L
4-Chloroaniline	464.00	78303	106478	mg/Kg
4-Chlorophenyl phenyl ether	33.00	34641	7005723	µg/L
4-Chlorotoluene	540.00	77277	106434	µg/L
4-Methyl-2-pentanone	34.00	78133	108101	µg/L
4-Methyl-o-cresol	17.02	34606	105679	µg/L
4-Methylphenol	35.00	77146	106445	µg/L
4-Nitroaniline	36.00	73278	100016	µg/Kg
4-Nitrophenol	37.00	34646	100027	µg/L
5-Bromopyrimidine	104.00			
5-Hydroxy Dicamba	256.00			µg/L
AAtrex	281.01	39033	1912249	µg/L
Acenaphthene	38.00	34205	83329	µg/L
Acenaphthylene	39.00	34200	208968	µg/L
Acephate	385.02	81815	30560191	µg/L
Acetone	40.00	81552	67641	µg/L
Acifluorfen	215.00	79193	8247659	µg/L
Acrolein	105.00	34210	107028	µg/L
Acrylamide	593.00	38576	79061	µg/L
Acrylonitrile	106.00	34215	107131	µg/L
Alachlor	273.00	77825	15972608	µg/L
Alanex	273.01	77825	15972608	µg/L
Aldicarb	274.00	39053	116063	µg/L
Aldicarb sulfone	320.00	82587	1646884	µg/L
Aldicarb sulfoxide	318.00	82586	1646873	µg/L
Aldrin	107.00	39330	309002	µg/L
Alkalinity as CaCO3, Total	463.00	00410	471341	mg/L
Alkalinity, Total (CaCO3)	246.00	00410	471341	mg/L
Alpha Particle Activity, gross	611.00	01519	12587461	pCi/L
Aluminum, Dissolved	511.00	01106	7429905	µg/L
Aluminum, Total	510.00	01105	7429905	µg/L
Aluminum, Total Recoverable	108.00	01104	7429905	µg/L

APPENDIX D: CHEMICAL DICTIONARY
01/27/93

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
Ametryn	275.00	82184	834128	µg/L
Amiben	276.00	82051	133904	µg/L
Aminocarb	277.00	38404	2032599	µg/L
Aminotriazole	278.00	73509	61825	µg/L
Amitrole	278.01	73509	61825	µg/L
Ammonia-N, Total as-N	109.00	00610	17778880	mg/L
Aniline	110.00	77089	62533	µg/L
Anion Balance	111.00			
Anthracene	112.00	34220	120127	µg/L
Antimony, Dissolved	524.00	01095	7440360	µg/L
Antimony, Total	113.00	01097	7440360	µg/L
Antimony, Total Recoverable	21.00	01268	7440360	µg/L
Aqualin	105.01	34210	107028	µg/L
Aramite	594.00		140578	µg/L
Arocior 1016	114.00	34671	12674112	µg/L
Arocior 1221	115.00	39488	1104282	µg/L
Arocior 1232	116.00	39492	11141165	µg/L
Arocior 1242	117.00	39496	53469219	µg/L
Arocior 1248	118.00	39500	12672296	µg/L
Arocior 1254	119.00	39504	11097691	µg/L
Arocior 1260	120.00	39508	11096825	µg/L
Arsenic, Dissolved	322.00	01000	7440382	µg/L
Arsenic, Inorganic (dissolved)	121.00	01000	7440382	µg/L
Arsenic, Total	137.00	01002	7440382	µg/L
Arsenic, Total Recoverable	122.00	00978	7440382	µg/L
Asbestos	123.00	34225	1332214	µg/L
Atraton	280.00	82185	1610179	µg/L
Atrazine	281.00	39033	1912249	µg/L
Avadex	532.00	73386	2303164	mg/Kg
Avenge	330.01	78882	43222486	µg/L
Azinphos-Ethyl	282.00	81292	2642719	µg/L
Azinphos-Methyl (Guthion)	359.01	39580	86500	µg/L
Azobenzene	595.00	77625	103333	µg/L
Azodrin	383.01	81890	6923224	µg/L
BFB	469.00			%
BHC	132.00	81283	608731	µg/L
BOD	499.01	00310		mg/L
Balan	283.00	39002	1861401	µg/L
Banvel	284.00	82052	1918009	µg/L
Barium, Dissolved	508.00	01005	7440393	µg/L
Barium, Total	509.00	01007	7440393	µg/L
Barium, Total Recoverable	124.00	01009	7440393	µg/L
Basagran	286.01	38710	25057890	µg/L
Basalin	354.01	79184	3324539	µg/L
Bassanite	337.01	81287	88857	µg/L
Baygon	424.01	38537	114261	µg/L
Baymix	307.02	81293	56724	µg/L

APPENDIX D: CHEMICAL DICTIONARY
01/27/93

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
Baytex	351.01	38685	55389	µg/L
Benefin	283.01	39002	1861401	µg/L
Benfluralin	283.02	39002	1861401	µg/L
Benlate	285.01	38705	17804352	µg/L
Benomyl	285.00	38705	17804352	µg/L
Bensulide	288.01	82197	741582	µg/L
Bentazon	286.00	38710	25057890	µg/L
Benz(a)anthracene	130.01	34526	56553	µg/L
Benzene	41.00	34030	71432	µg/L
Benzene, 1-chloro-4-(methylsulfony +	572.00			
Benzidine	125.00	39120	92875	µg/L
Benzo(a)anthracene	130.00	34526	56553	µg/L
Benzo(a)pyrene	126.00	34247	50328	µg/L
Benzo(b)fluoranthene	127.00	34230	205992	µg/L
Benzo(b/k)fluoranthene	531.00	34242	207089	µg/L
Benzo(g,h,i)perylene	128.00	34521	191242	µg/L
Benzo(ghi)perylene	128.01	34521	191242	µg/L
Benzo(k)fluoranthene	129.00	34242	207089	µg/L
Benzoic acid	42.00	77247	65850	µg/L
Benzoi	41.01	34030	71432	µg/L
Benzotrichloride	596.00		98077	µg/L
Benzyl alcohol	43.00	77147	100516	µg/L
Benzyl chloride	597.00	73520	100447	µg/L
Beryllium, Dissolved	515.00	01010	7440417	µg/L
Beryllium, Total	514.00	01012	7440417	µg/L
Beryllium, Total Recoverable	131.00	00998	7440417	µg/L
Beta Particle Activity, gross	612.00	85817	12587472	pCi/L
Betasan	288.00	82197	741582	µg/L
Bicarbonate as CaCO3	454.00	00425	471341	mg/L
Bicarbonate as HCO3	133.00	00440	71523	mg/L
Bidrin	328.01	38454	141662	µg/L
Bifenox	382.01	78883	42576023	µg/L
Biochemical Oxygen Demand	499.00	00310		mg/L
Bis(2-chloroethoxy)methane	44.00	34278	111911	µg/L
Bis(2-chloroethyl)ether	45.00	34273	111444	µg/L
Bis(2-chloroisopropyl)ether	46.00	34283	108601	µg/L
Bis(2-ethylhexyl) ester hexanedioi +	577.00	103321		
Bis(2-ethylhexyl)phthalate	140.00	39100	117817	µg/L
Bis(chloromethyl)ether	598.00	34268	542881	µg/L
Bis(n-octyl)phthalate	466.01	34596	117840	µg/L
Boron	134.00	01020	7440428	µg/L
Bravo	313.02	70314	1897456	µg/L
Bromacil	288.00	82198	314409	µg/L
Bromax	386.01	38855	300765	µg/L
Bromide(dissolved)	135.00	82298	24959679	µg/L
Bromobenzene	542.00	81555	108861	µg/L

APPENDIX D: CHEMICAL DICTIONARY
01/27/93

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
Bromochloromethane	533.00	32105	124481	µg/L
Bromodichloromethane	47.00	32101	75274	µg/L
Bromoform	48.00	32104	75252	µg/L
Bromomethane	49.00	34413	74839	µg/L
Bromoxynil (Water, Whole)	556.00	70979	1689845	µg/L
Butachlor, Water/Whole/Recoverable	633.00	30235	23184669	µg/L
Butanone	376.02	81595	78933	µg/L
Butyl benzyl phthalate	136.00	34292	85687	µg/L
Butylate	290.00	81410	2008415	µg/L
Butylbenzenes, Total	292.01	45049		µg/L
C3-Alkylbenzenes, Total	291.00	45046		µg/L
C4-Alkylbenzenes, Total	292.00	45049		µg/L
CEC	161.01	81356		meq/100G
CIPC	305.01	81322	101213	µg/L
COD	492.01	81319		mg/L
Cadmium, Dissolved	406.00	01025	7440439	µg/L
Cadmium, Total	407.00	01027	7440439	µg/L
Cadmium, Total Recoverable	138.00	01113	7440439	µg/L
Calcium	521.00	00910	7440702	mg/L as CaCO3
Calcium, Dissolved	520.00	00915	7440702	mg/L
Calcium, Total	141.00	00916	7440702	mg/L
Camphor (ACN)	287.00	81324	76222	µg/L
Captan	293.00	39640	133062	µg/L
Carbaryl	294.00	77700	63252	µg/L
Carbazole	329.00	77571	86748	µg/L
Carbendazim	295.00	38735	10605217	µg/L
Carbofuran	296.00	81405	1563662	µg/L
Carbon disulfide	50.00	77041	75150	µg/L
Carbon tetrachloride	51.00	32102	56235	µg/L
Carbon, Total Organic	250.00	00680	7440440	µg/L
Carbonate as CO3	142.00	00445	3812326	mg/L
Carbonate as CaCO3	455.00	00430	471341	mg/L
Carbophenothion	297.00	39786	786196	µg/L
Carboxin	139.00	70987	5234684	µg/L
Cation Balance	143.00			
Cation Exchange Capacity	161.00	81356		meq/100G
Chemical Oxygen Demand	492.00	81319		mg/L
Chloramben	276.01	82051	133904	µg/L
Chlordane	144.00	39350	57749	µg/L
Chlordecon	298.00	81281	143500	µg/L
Chlordimeform	299.00	77953	6164983	µg/L
Chloride, Total	148.00	00940	16887006	mg/L
Chlorine, Total Residual	146.00	50060	7782505	mg/L
Chlorobenzene	52.00	34301	108907	µg/L
Chlorobenzilate	300.00	39460	510156	µg/L
Chlorocyclohexane	86.00	77217	542187	µg/L
Chlorodibromomethane	58.01	32106	124481	µg/L
Chloroethane	53.00	34311	75003	µg/L

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
Chloroethene	82.03	39175	75014	µg/L
Chloroethylene	82.02	39175	75014	µg/L
Chloroform	54.00	32106	67663	µg/L
Chloromethane	55.00	34418	74873	µg/L
Chloroneb	301.00	38423	2675776	µg/L
Chloropicrin	303.00	77548	76062	µg/L
Chloropropham	305.00	81322	101213	µg/L
Chloropropylate	302.00	38429	5836102	µg/L
Chlorothalonil	313.01	70314	1897456	µg/L
Chlorpyrifos	304.00	77969	2921882	µg/L
Chlorthal	314.02	39770	1861321	µg/L
Chromium VI	506.01	01032	18540299	µg/L
Chromium, Dissolved	516.00	01030	7440473	µg/L
Chromium, Hexavalent	506.00	01032	18540299	µg/L
Chromium, Total	491.00	01034	7440473	µg/L
Chromium, Total Recoverable	147.00	01118	7440473	µg/L
Chrysene	148.00	34320	218019	µg/L
Cinnamene	74.03	77128	100425	µg/L
Clodrin	306.00	82565	7700176	µg/L
Co-Ral	307.01	81293	56724	µg/L
Cobalt	149.00	01037	7440484	µg/L
Coliform, Fecal	505.01	31616		#/100ml
Coliform, Total	150.00	31628		#/100ml
Color	599.00		00080	std. units
Conductivity	449.02		00094	µmhos/cm
Copper, Dissolved	408.00	01040	7440508	µg/L
Copper, Total	442.00	01042	7440508	µg/L
Copper, Total Recoverable	152.00	01119	7440508	µg/L
Corrosivity	600.00			std. units
Coumaphos	307.00	81293	56724	µg/L
Creosote	308.00	39140	8001589	µg/L
Crotoxyphos	306.01	82565	7700176	µg/L
Cumene	309.00	77223	98828	µg/L
Cyanazine	310.00	81757	21725462	µg/L
Cyanide	153.00	78248	57125	µg/L
Cyanide, Dissolved Std Method	279.00	00723	57125	µg/L
Cycloate	311.00	81892	1134232	µg/L
Cyclohexane	254.00	81570	110827	µg/L
D-D Mix	441.01	81610	96184	µg/L
DBCP	315.00	38761	96128	µg/L
DCNA	316.00	38447	99309	µg/L
DCOD	168.01	80116		mg/L
DCPA	314.01	39770	1861321	µg/L
DDD	208.00	39360	72548	µg/L
DDE	209.00	39365	72559	µg/L
DDT	210.00	39370	50293	µg/L
DDVP	317.00	73071	62737	µg/L

APPENDIX D: CHEMICAL DICTIONARY
01/27/93

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
DEF	324.00	81295	78488	µg/L
DMPA	336.00	81285	299854	µg/L
DNBP	337.00	81287	88857	µg/L
DNOC	338.00	34657	534521	µg/L
DO	169.01	00299	7782447	mg/L
Daconil	313.00	70314	1897456	µg/L
Dacthal	314.00	39770	1861321	µg/L
Dalapon	312.00	38432	75990	µg/L
Dasanit	350.01	38684	115902	µg/L
Demeton	325.00	39560	8065483	µg/L
Devrinol	387.01	79195	1529999	µg/L
Di-n-butylphthalate	155.00	39110	84742	µg/L
Di-n-octylphthalate	465.00	34596	117840	µg/L
Diallate	532.01	73386	2303164	mg/Kg
Diazinon	158.00	39570	333415	µg/L
Dibenz(a,h)anthracene	159.01	34556	53703	µg/L
Dibenz(a,h)anthracene-d	14557.00	79040	53703	mg/Kg
Dibenzo(a,h)anthracene	159.00	34556	53703	µg/L
Dibenzofuran	57.00	81302	132649	µg/L
Dibromochloromethane	58.00	32105	124481	µg/L
Dibromochloropropane	315.01	38761	96128	µg/L
Dibromodichloromethane	489.00	77779	594183	µg/L
Dibromomethane	160.00	81522	106934	µg/L
Dicamba	284.01	82052	1918009	µg/L
Dichloran	316.01	38447	99309	µg/L
Dichlorobromomethane	47.01	32101	75274	µg/L
Dichlorodifluoromethane	162.00	34668	75718	µg/L
Dichloromethane	68.02	34423	75092	µg/L
Dichloroprop	244.00	30190	120365	µg/L
Dichlorvos (DDVP)	317.01	73071	62737	µg/L
Dicofol	327.00	39780	115322	µg/L
Dicrotophos	328.00	38454	141662	µg/L
Dicyclopropyl methanone	579.00			µg/L
Dieldrin	164.00	39380	60571	µg/L
Diesel	472.00	78939	68476346	µg/L
Diethyl ether	165.00	81576	60297	µg/L
Diethylphthalate	59.00	34336	84662	µg/L
Diethylphthalate-d4	558.00			
Difenson	397.01	39022	80331	µg/L
Difenzoquat	330.00	78882	43222486	µg/L
Diisopropyl ether	154.00	81577	108203	µg/L
Dimecron	414.01	78881	13171216	µg/L
Dimethoate	331.00	46314	60515	µg/L
Dimethyl ketone	40.02	81552	67641	µg/L
Dimethyldisulfide	166.00	81580	624920	µg/L
Dimethylphthalate	60.00	34341	131113	µg/L
Dimethyltetrachlorophthalate	314.03	39770	1861321	µg/L
Dinitro-o-cresol	338.01	34657	534521	µg/L

APPENDIX D: CHEMICAL DICTIONARY
01/27/93

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
Dinoseb	337.02	81287	88857	µg/L
Dioxathion	332.00	38783	78342	µg/L
Dioxin	87.01	34675	1746016	µg/L
Diphenamide	333.00	78004	957517	µg/L
Diphenoloxide	167.00	77587	101848	µg/L
Diquat	334.00	78885	85007	µg/L
Direct Black 38	601.00			µg/L
Direct Blue 6	602.00		2602462	µg/L
Direct Brown 95	603.00		16071866	µg/L
Dissolved COD	168.00		80116	mg/L
Dissolved Oxygen	169.00	00299	7782447	mg/L
Dissolved TOC	170.00	00679	7440440	kg/100GAL
Disulfoton sulfone	642.00			µg/L
Disulfoton (Di-Syston)	171.00	81888	298044	µg/L
Disulfoton sulfoxide	643.01	81030	2497076	µg/L
Dithane	365.01	38831	8018017	µg/L
Dithiocarbamate	446.01	38917	137304	µg/L
Diuron	335.00	39650	330541	µg/L
Dowpon	312.01	38432	75990	µg/L
Dursban	304.01	77969	2921882	µg/L
Dyfonate	339.00	81294	944229	µg/L
Dylox	340.00	39014	52686	µg/L
EC	449.01	00094		µmhos/cm
EDB	8.01	77651	106934	µg/L
EPN	344.00	81290	2104645	µg/L
EPTC	345.00	81894	759944	µg/L
Endosulfan	341.00	34361	959988	µg/L
Endosulfan I	341.01	34361	959988	µg/L
Endosulfan II	342.00	34356	33213659	µg/L
Endosulfan Sulfate	172.00	34351	1031078	µg/L
Endothall	343.00	38926	145733	µg/L
Endrin	174.00	39390	72208	µg/L
Endrin Aldehyde	173.00	34366	7421934	µg/L
Endrin Ketone	490.00	78008	53494705	µg/L
Enide	333.01	78004	957517	µg/L
Epichlorohydrin	604.00	106898		µg/L
Eptam	345.01	81894	759944	µg/L
Etazine	428.01	38542	26259450	µg/L
Ethanol	346.00	77004	64175	µg/L
Ethenylbenzene	74.04	77128	100425	µg/L
Ethion	175.00	39398	563122	µg/L
Ethoprop	634.00	81758	13194484	µg/L
Ethyl acetate	176.00	81585	141786	µg/L
Ethyl acrylate	605.00		140885	µg/L
Ethyl alcohol	346.01	77004	64175	µg/L
Ethyl isopropyl ketone	95.01	78133	108101	µg/L
Ethylan	411.01	39034	72560	µg/L

APPENDIX D: CHEMICAL DICTIONARY
01/27/93

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
Ethylbenzene	61.00	34371	100414	µg/L
Ethylene dibromide	8.02	77651	106934	µg/L
Ethylene dichloride	10.01	34531	107062	µg/L
Ethylene glycol	347.00	77023	107211	µg/L
Ethylene thiourea	348.01	38928	96457	µg/L
Ethylidene thiourea	348.00	38928	96457	µg/L
Evik	275.01	82184	834128	µg/L
Fecal Coliform, MFM-FCBR	505.00	31616		#/100ml
Fenamiphos	349.00	38929	22224926	µg/L
Fenarimol	635.00			µg/L
Fensulfothion	350.00	38684	115902	µg/L
Fenthion	351.00	38685	55389	µg/L
Fenuron	352.00	38468	101428	µg/L
Ferbam	353.00	38806	14484641	µg/L
Ferric(3+)	188.01	01045	7439896	µg/L
Ferrous(2+)	188.02	01045	7439896	µg/L
Fluchloralin	354.00	79194	3324539	µg/L
Fluoranthene	177.00	34376	206440	µg/L
Fluorene	62.00	34381	86737	µg/L
Fluorescein(Sodium)	178.00		518478	
Fluoride	179.00	00950	16984488	mg/L
Fluormeturon	355.00	38811	2164172	µg/L
Fluridone	636.00		59756604	µg/L
Foaming Agents	606.00	01288		mg/L
Folex	369.01	39019	150505	µg/L
Folpet	607.00	46351	133073	µg/L
Fonofos	339.01	81294	944229	µg/L
Formaldehyde	356.00	71880	50000	mg/L
Freon 113	3.01	77652	76131	µg/L
Freon 12, Halon	162.01	34668	75718	µg/L
Furadan	296.01	81405	1563662	µg/L
Furazolidone	608.00	67458		µg/L
Furium	609.00			µg/L
Furmecyclox	610.00		60568050	µg/L
Gardona	581.01	38877	961115	
Gardoprim	436.01	38559	5915413	µg/L
Gasoline	471.00		6842596	
Geastamin	280.01	82185	1610179	µg/L
Glyphosate	358.00	79743	1071836	µg/L
Grain alcohol	346.02	77004	64175	µg/L
Guthion	359.00	39580	86500	µg/L
Hardness, Total	248.00	00900	471341	mg/L CaCO3
Heptachlor	181.00	39410	76448	µg/L
Heptachlor Epoxide	180.00	39420	1024573	µg/L
Heptane	182.00	81589	25339564	µg/L
Hexachlorobenzene	183.00	39700	118741	µg/L
Hexachlorobutadiene	63.00	34391	87683	µg/L

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
Hexachlorocyclohexane	132.01	81283	608731	µg/L
Hexachlorocyclohexane (alpha)	265.04	39337	319846	µg/L
Hexachlorocyclopentadiene	64.00	34386	77474	µg/L
Hexachloroethane	65.00	34396	67721	µg/L
Hexazinone	360.00	38815	51235042	µg/L
Hydram	394.02	82199	2212671	µg/L
Hydrazine	184.00	81313	302012	mg/L
Hydrocarbons, Total	473.00	81336		mg/L
Hydrocarbons, Total Fuel	462.00			
Hydrocarbons, Total Petroleum	461.00	46116	14280309	mg/L
Hydroxide	185.00	71830	14280309	mg/L
Hydroxide as CaCO3	456.00			
Hyvar	289.01	82198	314409	µg/L
IPC	423.01	39052	122429	µg/L
Imidan	361.00	39800	732116	µg/L
Indeno(1,2,3-cd)pyrene	186.00	34403	193395	µg/L
IntStd: 2,4,6-Tribromophenol	559.00	34719	118796	µg/L
IntStd: Hexabromobenzene	560.00			
Ion Balance	451.00			%
Ioxynil	561.00		16898341	µg/L
Iron, Dissolved	323.00	01046	7439896	µg/L
Iron, Total	188.00	01045	7439896	µg/L
Iron, Total Recoverable	362.00	00980	7439896	µg/L
Isobutylbenzene	552.00	77334	538932	µg/L
Isophorone	66.00	34408	78591	µg/L
Isopropyl carbanilate	423.02	39052	122429	µg/L
Isopropylbenzene (Cumene)	309.01	77223	98828	µg/L
Karmex	335.01	39650	330541	µg/L
Kepone	298.01	81281	143500	µg/L
Kerb	419.01	39080	23950585	mg/Kg
Kerosene	363.00	78878	8008206	µg/L
Kjeldahl-N, Total	249.00	00625	17778880	mg/L as N
Langlier Index	500.00			
Lead, Dissolved	402.00	01049	7439921	µg/L
Lead, Organic	463.00			
Lead, Total	403.00	01051	7439921	µg/L
Lead, Total Recoverable	189.00	01114	7439921	µg/L
Lindane	357.01	39340	58899	µg/L
Linuron	364.00	39530	330552	µg/L
Lithium	466.00	01130	7439932	µg/L
Loraban	304.02	77969	2921882	µg/L
MBAS	233.01	34790	7429905	mg/L
MCPA	367.00	39151	94746	µg/L
MCPA Dimethylamine Salt	367.01	39151	94746	µg/L
MCPB	368.00	38486	94815	µg/L
MCPP (Water, Total)	562.00	38491	93652	µg/L
MEK	376.01	81595	78933	µg/L

APPENDIX D: CHEMICAL DICTIONARY
01/27/93

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
MIBK	34.02	78133	108101	µg/L
MSMA	385.00	38935	2163806	µg/L
Magnesium as CaCO3	519.00	00920	7439954	mg/L
Magnesium, Dissolved	518.00	00925	7439954	mg/L
Magnesium, Total	191.00	00927	7439954	mg/L
Malathion	192.00	39530	121755	µg/L
Mancozeb	365.00	38831	8018017	µg/L
Maneb	366.00	38835	12427382	µg/L
Manganese, Dissolved	404.00	01056	7439965	µg/L
Manganese, Total	193.00	01055	7439965	µg/L
Manganese, Total Recoverable	405.00	01123	7439965	µg/L
Matacil	277.01	38404	2032599	µg/L
Mercury, Dissolved	477.00	71890	7439976	µg/L
Mercury, Total	476.00	71900	7439976	µg/L
Mercury, Total Recoverable	194.00	71901	7439976	µg/L
Merphos	369.00	39019	150505	µg/L
Mesitylene	370.00	77226	108678	µg/L
Metasystox	371.00	39020	8022002	µg/L
Methidathion	374.00	78879	950378	µg/L
Methiocarb	373.00	38500	2032657	µg/L
Methomidophos	372.00	38927	10265926	µg/L
Methomyl	375.00	39051	16752775	µg/L
Methoxychlor	195.00	39480	72435	µg/L
Methyl Phenols, Total	378.00	45058	1319773	µg/L
Methyl Trithion	197.00	39790	953173	µg/L
Methyl Xylenes, Total	444.01	78136	25551137	µg/L
Methyl bromide	49.01	34413	74839	µg/L
Methyl chloride	55.01	34418	74873	µg/L
Methyl ethyl ketone	378.00	81595	78933	µg/L
Methyl isobutyl ketone	34.01	78133	108101	µg/L
Methyl ketone	40.03	81552	67641	µg/L
Methyl n-butyl ketone	25.01	77103	591786	µg/L
Methyl n-propyl ketone	97.01	77060	107879	µg/L
Methyl paraoxon	637.00			µg/L
Methylbenzene	76.01	34010	108883	µg/L
Methylcyclohexane	198.00	77100	108872	µg/L
Methylene Blue Active Substances	493.00	38260	61734	
Methylene bromide	160.01	81522	106934	µg/L
Methylene chloride	68.00	34423	75092	µg/L
Metolachlor	163.00		51218452	µg/L
Metribuzin	379.00	81408	21087649	µg/L
Mevinphos	413.01	38610	7786347	µg/L
Mexacarbate	380.00	38507	315184	µg/L
Mirex	381.00	39755	2385855	µg/L
Modown	382.00	78883	42576023	µg/L
Molinate	394.01	82199	2212671	µg/L

APPENDIX D: CHEMICAL DICTIONARY
01/27/93

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
Molybdenum	467.00	01060	7439987	µg/L
Monitor	372.01	38927	10265926	µg/L
Monochloroethene	82.04	38175	75014	µg/L
Monochloroethylene	82.01	39175	75014	µg/L
Monocrotophos	383.00	81890	6923224	µg/L
Monosodium methyl arsonate	385.01	38935	2163806	µg/L
Monuron	384.00	38511	150688	µg/L
N-Nitroso-N-methylethylamine	613.00	73613	10595956	µg/L
N-Nitroso-di-n-butylamine	614.00	73609	924163	µg/L
N-Nitroso-di-n-propylamine	69.00	34428	621647	µg/L
N-Nitrosodiethanolamine	615.00	73610	1116547	µg/L
N-Nitrosodiethylamine	616.00	73611	55185	µg/L
N-Nitrosodimethylamine	392.00	34438	62759	µg/L
N-Nitrosodiphenylamine	199.00	34433	86306	µg/L
N-Nitrosopyrrolidine	617.00	78206	930552	µg/L
NH3-N, Total	109.01	00610	17778880	mg/L as N
NO3 + NO2-N, Total	321.01	00630	17778880	mg/L as N
Naled	386.00	38855	300765	µg/L
Naphthalene	70.00	34696	91203	µg/L
Napropamide	387.00	79195	1529999	µg/L
Neburon	388.00	38521	555373	µg/L
Nemacure	349.01	38929	22224926	µg/L
Nickel, Dissolved	481.00	01065	7440020	µg/L
Nickel, Total	483.00	01067	7440020	µg/L
Nickel, Total Recoverable	200.00	01074	7440020	µg/L
Nitrate + Nitrite-N, Total	321.00	00630	17778880	mg/L as N
Nitrate-N	452.00	00620	17778880	mg/L as N
Nitrite-N	202.00	00615	17778880	mg/L as N
Nitrobenzene	71.00	34447	98953	µg/L
Nitrofen	389.00	81303	1836755	µg/L
Nitrofurazone	618.00	59870		µg/L
Nitroguanidine	203.00	79753	556887	µg/L
Nonadecane	391.00	77822	629925	µg/L
Norflurazon, in Water	639.00	78064		µg/L
OBPA	206.00	58366		
Octachloronaphthalene	563.00		2234131	µg/L
Odor	619.00			std. units
Oil & Grease	207.00	03582		mg/L
Ordram	394.00	82199	2212671	µg/L
Orthene	396.00	81815	30560191	µg/L
Oryzalin	398.00	78884	19044883	µg/L
Ovex	397.00	39022	80331	µg/L
Oxamyl	398.00	38865	23135220	µg/L
Oxydisulfoton (Disyston Sulphoxide)	643.00	81030	2497078	µg/L
PAH (Polyaromatic hydrocarbons)	620.00			µg/L
PBB (Polybrominated Biphenyls)	621.00		59536661	µg/L
PCB	218.01	78012	1336363	µg/L

APPENDIX D: CHEMICAL DICTIONARY
01/27/93

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
PCB-1016	114.01	34671	12674112	µg/L
PCB-1221	115.01	39488	1104282	µg/L
PCB-1232	116.01	39492	11141165	µg/L
PCB-1242	117.01	39496	53469219	µg/L
PCB-1248	118.01	39500	12672296	µg/L
PCB-1254	119.01	39504	11097691	µg/L
PCB-1260	120.01	39508	11096825	µg/L
PCE	75.01	34475	127184	µg/L
PCNB	409.00	39029	81316	µg/L
PCP	213.01	39032	87865	µg/L
PID Reading	470.00			
Paraquat	399.00	82416	4685147	µg/L
Parathion	212.00	39540	56382	µg/L
Parathion, Ethyl-	400.00	46315	56382	µg/L
Parathion, Methyl-	401.00	39600	298000	µg/L
Pebulate, Water, Whole	640.00	79192		µg/L
Pendimethalin	222.02	79190	40487421	µg/L
Penoxalin	222.00	82410	40487421	µg/L
Pentachlorobenzene	410.00	77793	608935	µg/L
Pentachlorophenol	213.00	39032	87865	µg/L
Perchlorate	214.00			
Perchloroethene	75.03	34475	127184	µg/L
Perchloroethylene	75.02	34475	127184	µg/L
Persulfate-N, Total	580.00		7727540	µg/L
Perthane	411.00	39034	72560	µg/L
Phenanthrene	216.00	34461	85018	µg/L
Phencapton (Water, Whole)	564.00	81289	2275141	µg/L
Phenol	73.00	34694	108952	µg/L
Phenol, 4-AAP	217.00		108952	
Phenylethylene	74.02	77128	100425	µg/L
Phorate	218.00	46313	298022	µg/L
Phosalone	412.00	81291	2310170	µg/L
Phosdrin	413.00	39610	7786347	µg/L
Phosmet	361.01	39800	732116	µg/L
Phosphamide	331.01	46314	60515	µg/L
Phosphamidon	414.00	78881	13171216	µg/L
Phosphate-P, Diss Ortho	498.00	00671	7723140	mg/L as P
Phosphate-P, Ortho	205.00	00660	14265442	mg/L as PO 4
Phosphorodithioic acid, O,O,S-trim+	573.00	39580	86500	µg/L
Phosphorous-P, Total	251.00	00665	7723140	mg/L as P
Picloram	257.00	39720	1918021	µg/L
Polychlorinated biphenyl	219.00	78012	1336363	µg/L
Potassium, Dissolved	517.00	00935	7440097	mg/L
Potassium, Total	220.00	00937	7440097	mg/L
Princep	430.01	39055	122349	µg/L
Profluralin	415.00	38872	26399360	µg/L

APPENDIX D: CHEMICAL DICTIONARY
01/27/93

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
Prometon	416.00	39056	1610180	µg/L
Prometryn	417.00	39057	7287196	µg/L
Pronamide	419.00	39080	23950585	µg/L
Propachlor	418.00	38533	1918167	µg/L
Propane	420.00	82358	74986	µg/L
Propanone	40.01	81552	67641	µg/L
Propargite	421.00	82085	2312358	mg/L
Propazine	422.00	39024	139402	µg/L
Propham	423.00	39052	122429	µg/L
Propoxur	424.00	38537	114261	µg/L
Propylbenzenes, Total	291.01	45046		µg/L
Propylene oxide	622.00	77011	75569	µg/L
Prowl	222.01	79190	40487421	µg/L
Prowl, Lechate	221.00	79190	40487421	µg/L
Prowl, Soil	223.00	85793	40487421	µg/L
Pyrene	224.00	34469	129000	µg/L
Pyrethrins	425.00	39930	8003347	µg/L
Radium 226	623.00	09501	13982633	pCi/L
Radium 226 & 228	624.00	11503		pCi/L
Retene	457.00	73076	483658	µg/L
Roneet	311.01	81892	1134232	µg/L
Ronnel	427.00	39357	299843	µg/L
Round-up	426.00	39941	1071836	µg/L
SCA	225.00			
Secbumeton	428.00	38542	26259450	µg/L
Selenium, Dissolved	484.00	01145	7782492	µg/L
Selenium, Total	485.00	01147	7782492	µg/L
Selenium, Total Recoverable	226.00	00981	7782492	µg/L
Sencore	379.01	81408	21087649	µg/L
Sevin	294.01	77700	63252	µg/L
Siduron	429.00	38548	1982496	µg/L
Silica (SiO2)	227.00	00992	7631869	µg/L
Silicate	497.00	00958		mg/L
Silver, Dissolved	495.00	01075	7440224	µg/L
Silver, Total	234.00	01077	7440224	µg/L
Silver, Total Recoverable	228.00	01079	7440224	µg/L
Simazine	430.00	39055	122349	µg/L
Simetryn	431.00	39054	1014706	µg/L
Sodium Absorption Ratio	501.00	00931	7440235	SAR
Sodium Chlorate	229.00	00726	7775099	µg/L
Sodium, Total	450.00	00929	7440235	mg/L
Solids, Total Dissolved	247.03	70300		µg/L
Solids, Total Suspended	496.01	74016		mg/L
Specific Conductance (Field)	502.00	00094		µmhos/cm
Specific Conductance @ 25C (LAB)	151.00	00095		µmhos/cm
Specific Conductance(FIELD)	449.00	00094		µmhos/cm

APPENDIX D: CHEMICAL DICTIONARY
01/27/93

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
Stirofos	432.00	38877	961115	µg/L
Strontium-90	625.00	13501	10098972	pCi/L
Styrene	74.00	77128	100425	µg/L
Sulfate, Total	230.00	00945	14808798	mg/L as SO4
Sulfide, Total	231.00	00745	18496258	mg/L
Sulfite, Total	232.00	00740	14265453	mg/L as SO3
Sumitol	428.02	38542	26259450	µg/L
Supracide	374.01	78879	950378	µg/L
Surfactants	233.00	03581		mg/L
Surflan	396.01	78884	19044883	µg/L
Surrog: 1,2-Dichloroethane-d4	460.00			%
Surrog: 1,4-Bromofluorobenzene	187.00			
Surrog: 1-Bromo-2-floroethane	157.00			
Surrog: 2-Chlorophenol-d4 (spike)	565.00	95978		
Surrog: 2-Fluorobiphenyl	479.00			
Surrog: 2-Fluorophenol	480.00			
Surrog: 4-Chloroaniline-d4	566.00			
Surrog: Dibutylchlorendate (spike)	567.00			
Surrog: Fluorene-d10 (spike)	568.00			
Surrog: Nitrobenzene-d5	474.00			
Surrog: Phenol-d5	526.00			
Surrog: Pyrene-d10 (spike)	377.00			
Surrog: Toluene-d8	458.00			%
Surrog: p-Terphenyl-d14	525.00			
Sutan	290.01	81410	2008415	µg/L
Swep	433.00	38555	918189	µg/L
Systox	325.01	39560	8065483	µg/L
T3	236.00	78166		µg/L
T4	237.00	51489		µg/L
TCE	80.01	39180	79016	µg/L
TDS	247.01	70300		µg/L
TEPP	435.00	39620	107493	µg/L
TPH	462.01			
TKN	249.01	00625	17778880	mg/L as N
TOC	250.01	00680	7440440	µg/L
TOS (Calculated)	245.00			
TPH	461.01	46116	14280309	mg/L
TPN, Total Persulfate Nitrogen	580.01		7727540	µg/L
TSS	496.00		74016	mg/L
Tebuthiuron	190.00		34014181	µg/L
Tedion	434.00	39808	116290	µg/L
Temik	274.01	39063	116063	µg/L
Temperature, 0 C	238.00	00010	0	C
Temperature, 0 F	239.00	00011	0	F
Terbacil	204.00		5902162	µg/L
Terbuthylazine	436.00	38559	5915413	µg/L
Terbutryn	437.00	38887	886500	µg/L

APPENDIX D: CHEMICAL DICTIONARY
01/27/93

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
Tetrachloroethene	75.00	34475	127184	µg/L
Tetrachloroethylene	75.04	34475	127184	µg/L
Tetrachloromethane	51.01	32102	56235	µg/L
Tetrachlorophenol	438.00	81849	25167833	µg/L
Tetrachlorvinphos	581.00	38877	961115	
Tetradifon	434.01	39808	116290	µg/L
Tetraethyldiphosphate	435.01	39620	107493	µg/L
Tetrahydrofuran	241.00	81607	109999	µg/L
Thallium, Dissolved	522.00	01057	7440280	µg/L
Thallium, Total	523.00	01059	7440280	µg/L
Thallium, Total Recoverable	242.00	00982	7440280	µg/L
Thiophanate	439.01	78880	23564069	µg/L
Thiosulfate	243.00			
Tin, Dissolved	513.00	01100	7440315	µg/L
Tin, Total	512.00	01102	7440315	µg/L
Tin, Total Recoverable	468.00	00983	7440315	µg/L
Titanium	469.00	01150	7440326	µg/L
Toluene	76.00	34010	108883	µg/L
Topsin-MR	439.00	78880	23564069	µg/L
Total BTEX	478.00	34103		µg/L
Total BTX	72.00	34103	n/a	µg/L
Total Dissolved Solids (residue)	247.00	70300		µg/L
Total Filterable Residue	247.02	70300		µg/L
Total Organic Halides	503.00	70353		µg/L
Total Organics	486.00	81299		µg/L
Total Solids	253.00	70297		Kg/100Gal
Total Solids	252.00	70318		%
Total Trihalomethanes	494.00	82080		µg/L
Toxaphene	255.00	39400	8001352	µg/L
Treflan	443.01	81284	1582098	µg/L
Triadimefon	440.00	38892	43121433	µg/L
Trichlorobenzoic acid	551.00	50317		
Trichloroethene	80.00	39180	79016	µg/L
Trichloroethylene	80.02	39180	79016	µg/L
Trichlorofluoromethane	83.00	34488	75694	µg/L
Trichloromethane	54.01	32106	67663	µg/L
Trichlorophon	340.01	39014	52686	µg/L
Trichlorotrifluoroethane	3.02	81611	26523648	µg/L
Trichlorotrinitrobenzenes,Total	258.00			
Tricyclazole, Water, Whole	641.00	38902	41814782	µg/L
Trifluralin	443.00	81284	1582098	µg/L
Trimethyl Benzenes, Total	444.00	78136	25551137	µg/L
Trimethyl phosphate	626.00		512561	µg/L
Trinitrobenzenes, Total	259.00			
Triphenyl phosphate (Water, Whole)	569.00	77881	115866	µg/L
Trithion	297.01	39786	786196	µg/L
Tritium	627.00	07000	10028178	pCi/L

APPENDIX D: CHEMICAL DICTIONARY
01/27/93

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
Turbidity(Lab)	260.00	82079		NTU
UDMH	261.00	81314	57147	mg/L
Vanadium (Dissolved)	262.00	10085	7440622	
Velpar	360.01	38815	51235042	µg/L
Vernam	445.01	82200	1929777	µg/L
Vernolate	445.00	82200	1929777	µg/L
Vinyl acetate	81.00	77057	108054	µg/L
Vinyl chloride	82.00	39175	75014	µg/L
Vinyl trichloride	4.01	34511	79005	µg/L
Vinylbenzene	74.01	77128	100425	µg/L
Volatile Dissolved Solids	263.00			
Volatile Organic Compounds	487.00		78733	mg/L
Xylene Isomers, M + P, Whole Water	578.00		85795	µg/L
Xylene Isomers, O + P, Whole Water	32.00		80353	µg/L
Xylene, m-	67.00	77134	108383	µg/L
Xylene, o-	77.00	77135	95476	µg/L
Xylene, p-	475.00	77133	106423	µg/L
Xylenes, Total	201.00	34020	1330207	µg/L
Zinc, Dissolved	504.00	01090	7440666	µg/L
Zinc, Total	507.00	01092	7440666	µg/L
Zinc, Total Recoverable	264.00	01094	7440666	µg/L
Zineb	447.00	38912	12122677	µg/L
Ziram	446.00	38917	137304	µg/L
Zolone	412.01	81291	2310170	µg/L
Zytron	336.01	81285	299854	µg/L
a-BHC	265.00	39337	319846	µg/L
a-Endosulfan	266.01	34361	959988	µg/L
alpha-BHC	265.03	39337	319846	µg/L
alpha-Benzene hexachloride	265.01	39337	319846	µg/L
alpha-Chlordane	530.00	39348	5103719	µg/L
alpha-Endosulfan	266.00	34361	959988	µg/L
alpha-Lindane	265.02	39337	319846	µg/L
b-BHC	267.00	39338	319857	µg/L
b-Endosulfan	268.00	34356	33213659	µg/L
beta-BHC	267.03	39338	319857	µg/L
beta-Benzene hexachloride	267.01	39338	319857	µg/L
beta-Endosulfan	268.01	34356	33213659	µg/L
beta-Lindane	267.02	39338	319857	µg/L
cis-1,2-Dichloroethene	328.00	77093	156592	µg/L
cis-1,2-Dichloroethylene	328.01	77093	156592	µg/L
cis-1,3-Dichloropropene	56.00	34704	10061015	µg/L
cis-1,3-Dichloropropylene	56.01	34704	10061015	µg/L
d-BHC	269.00	34259	319868	µg/L
delta-BHC	269.03	34259	319868	µg/L
delta-Benzene hexachloride	269.01	34259	319868	µg/L

APPENDIX D: CHEMICAL DICTIONARY
01/27/93

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
delta-Lindane	269.02	34259	319868	µg/L
g-BHC	357.00	39340	58899	µg/L
gamma-BHC (Lindane)	357.04	39340	58899	µg/L
gamma-Benzene hexachloride	357.03	39340	58899	µg/L
gamma-Chlordane	529.00	39065	5103742	µg/L
gamma-Lindane	357.02	39340	58899	µg/L
m-Diethylbenzene	549.01	77348	141935	µg/L
m-Dimethylbenzene	67.04	77134	108383	µg/L
m-Xylene	67.03	77134	108383	µg/L
meta-Xylene	67.02	77134	108383	µg/L
n-Butylbenzene	539.00	78483	104518	µg/Kg
n-Octacosane	390.00	78116	630024	µg/L
n-Propylbenzene	393.00	77224	103651	µg/L
o,p'-DDT	270.00	39305	789026	µg/L
o,p'-TDE	271.00	39315	53190	µg/L
o-Chloronitrobenzene	628.00		88732	µg/L
o-Chlorophenol	24.01	34586	95578	µg/L
o-Diethylbenzene	548.01	77340	135013	µg/L
o-Dimethylbenzene	77.03	77135	95476	µg/L
o-Phenylenediamine	629.00	73628	106503	µg/L
o-Toluidine	630.00	77142	95534	µg/L
o-Xylene	77.01	77135	95476	µg/L
ortho-Xylene	77.04	77135	95476	µg/L
p,a,a,a-Tetrachlorotoluene	632.00			µg/L
p,p'-DDD	208.02	39360	72548	µg/L
p,p'-DDE	209.02	39365	72559	µg/L
p,p'-DDT	210.02	39370	50293	µg/L
p,p'-TDE	272.00	39360	72548	µg/L
p-Chloro-m-cresol	31.02	34452	59507	µg/L
p-Chloronitobenzene	631.00		100005	µg/L
p-Cresol	35.01	77146	106445	µg/L
p-Diethylbenzene	550.01	77345	105055	µg/L
p-Dimethylbenzene	475.04	77133	106423	µg/L
p-Isopropyltoluene	538.00	77356	99876	µg/L
p-Nitrosniline	36.01	73278	100016	µg/Kg
p-Nitrophenol	37.01	34646	100027	µg/L
p-Xylene	475.02	77133	106423	µg/L
pH	448.00	00400		std. units
para-Xylene	475.01	77133	106423	µg/L
propyzamide	419.02	39080	23950585	µg/Kg
sec-Butylbenzene	543.00	78485	135988	µg/Kg
tert-Butylbenzene	537.00	78448	98066	µg/Kg
trans-1,2-Dichloroethene	78.00	34546	156605	µg/L
trans-1,2-Dichloroethylene	78.01	34546	156605	µg/L
trans-1,3-Dichloropropene	79.00	34699	10061026	µg/L
trans-1,3-Dichloropropylene	79.01	34699	10061026	µg/L
269	338.40			

APPENDIX E: LABORATORY QUALIFIERS

LIST OF QUALIFIERS FOR NUMERIC RESULTS

REMARK CODE	DEFINITION
B	Analyte is found in the blank as well as the sample, indicated possible/probable blank contamination.
J	Estimated value; not accurate.
M	Presence of material verified but not quantified
U or K	Compound was analyzed for but not detected. The associated numerical value is the sample quantitation detection limit.
UJ	Compound was analyzed for but not detected. The number is the estimated minimum detection limit.
C	The value is one of, or the sum of both, Benzo (b) Fluoranthene and Benzo (k) Fluoranthene.
X	Many background organisms.
H	Over holding time. Analysis run.
G	Improper container.
Z	Sample low due to interfering substance.
D	Sample high due to interfering substance.
IS	Interfering Substance.
P	Greater than (>).
A	Less than (<).
LMX	Lab Matrix Number.
LBK	Lab Blank Number.

APPENDIX E CONTINUED:

Data Qualifier Definitions

For the purpose of this document the following code letters and associated definitions are provided:

dr	- dry weight
wt	- wet weight
R	- The data are unusable (compound may or may not be present). Resampling and reanalysis is necessary for verification.
N	- Presumptive evidence of presence of material.
NJ	- Presumptive evidence of the presence of the material at an estimated quantity.
UJ	- The material was analyzed for, but was not detected. The sample quantitation limit is an estimated quantity.

The reviewer may determine that qualifiers other than those used in this document are necessary to describe or qualify the data. In these instances, it is the responsibility of each reporting entity to thoroughly document/explain the qualifiers used and notify Ecology prior to submition of data packages.

APPENDIX F: COUNTY FIPS CODES

WASHINGTON

001	ADAMS
003	ASOTIN
005	BENTON
007	CHELAN
009	CLALLAM
011	CLARK
013	COLUMBIA
015	COWLITZ
017	DOUGLAS
019	FERRY
021	FRANKLIN
023	GARFIELD
025	GRANT
027	GRAYS HARBOR
029	ISLAND