ENGINEERING CHANGE NOTICE

1. ECN 654982

Proj. ECN

2. ECN Category (mark one)	3. Originator's Name, Organization, MSIN, and Telephone No.	4. USQ Required?	5. Date
Supplemental [] Direct Revision [X] Change ECN [] Temporary [] Standby [] Supersedure [] Cancel/Void []	Charles H. Mulkey, Environmental Permits/Policy, R1-51, 373-0956	[] Yes [X] No	06/30/99
	6. Project Title/No./Work Order No. Data Quality Objectives for Regulatory Requirements	7. Bldg./Sys./Fac. No. N/A	8. Approval Designator E, Q
	9. Document Numbers Changed by this ECN (includes sheet no. and rev.) WHC-SD-WM-DQO-021, Rev. 0	10. Related ECN No(s). N/A	11. Related PO No. N/A

12a. Modification Work	12b. Work Package No.	12c. Modification Work Complete	12d. Restored to Original Condition (Temp. or Standby ECN only)
[] Yes (fill out Blk. 12b) [X] No (NA Blks. 12b, 12c, 12d)	N/A	N/A Design Authority/Cog. Engineer Signature & Date	N/A Design Authority/Cog. Engineer Signature & Date

13a. Description of Change

Complete revision.

13b. Design Baseline Document? [] Yes [X] No

14a. Justification (mark one)

Criteria Change	[X]	Design Improvement	[]	Environmental	[]	Facility Deactivation	[]
As-Found	[]	Facilitate Const	[]	Const. Error/Omission	[]	Design Error/Omission	[]

14b. Justification Details

Clarification and update of regulatory requirements.

15. Distribution (include name, MSIN, and no. of copies)

See attached distribution.

RELEASE STAMP

DATE: JUL 06 1999 STA: 4 HANFORD RELEASE ID: 2

ENGINEERING CHANGE NOTICE

1. ECN (use no. from pg. 1)
ECN-654982

16. Design Verification Required	17. Cost Impact				18. Schedule Impact (days)	
	ENGINEERING		CONSTRUCTION			
[ ] Yes	Additional	[ ] $	Additional	[ ] $	Improvement	[ ]
[X] No	Savings	[ ] $	Savings	[ ] $	Delay	[ ]

19. Change Impact Review: Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 13. Enter the affected document number in Block 20.

SDD/DD	[ ]	Seismic/Stress Analysis	[ ]	Tank Calibration Manual	[ ]
Functional Design Criteria	[ ]	Stress/Design Report	[ ]	Health Physics Procedure	[ ]
Operating Specification	[ ]	Interface Control Drawing	[ ]	Spares Multiple Unit Listing	[ ]
Criticality Specification	[ ]	Calibration Procedure	[ ]	Test Procedures/Specification	[ ]
Conceptual Design Report	[ ]	Installation Procedure	[ ]	Component Index	[ ]
Equipment Spec.	[ ]	Maintenance Procedure	[ ]	ASME Coded Item	[ ]
Const. Spec.	[ ]	Engineering Procedure	[ ]	Human Factor Consideration	[ ]
Procurement Spec.	[ ]	Operating Instruction	[ ]	Computer Software	[ ]
Vendor Information	[ ]	Operating Procedure	[ ]	Electric Circuit Schedule	[ ]
OM Manual	[ ]	Operational Safety Requirement	[ ]	ICRS Procedure	[ ]
FSAR/SAR	[ ]	IEFD Drawing	[ ]	Process Control Manual/Plan	[ ]
Safety Equipment List	[ ]	Cell Arrangement Drawing	[ ]	Process Flow Chart	[ ]
Radiation Work Permit	[ ]	Essential Material Specification	[ ]	Purchase Requisition	[ ]
Environmental Impact Statement	[ ]	Fac. Proc. Samp. Schedule	[ ]	Tickler File	[ ]
Environmental Report	[ ]	Inspection Plan	[ ]		[ ]
Environmental Permit	[ ]	Inventory Adjustment Request	[ ]		[ ]

20. Other Affected Documents: (NOTE: Documents listed below will not be revised by this ECN.) Signatures below indicate that the signing organization has been notified of other affected documents listed below.

Document Number/Revision	Document Number/Revision	Document Number Revision
N/A		

21. Approvals

Signature	Date	Signature	Date
Design Authority	7/6/99	Design Agent	
Cog. Eng. C.H. Mulkey		PE	
Cog. Mgr. D.J. Carrell	7/6/99	QA	
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		DEPARTMENT OF ENERGY	
		Signature or a Control Number that tracks the Approval Signature	
		ADDITIONAL	

S

Data Quality Objectives for Regulatory Requirements for Hazardous and Radioactive Air Emissions Sampling and Analysis

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U.S. Department of Energy Contract DE-AC06-96RL13200

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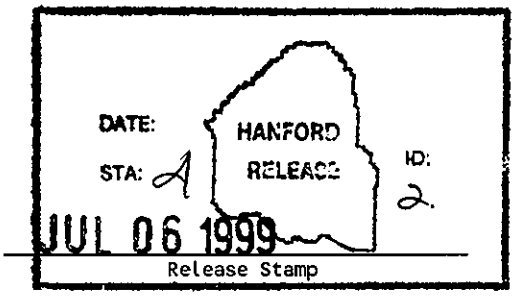

Release Stamp

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RECORD OF REVISION	(1) Document Number HNF-SD-WM-DQO-021	Page 1

(2) Title

Data Quality Objectives for Regulatory Requirements for Hazardous and Radioactive Air Emissions Sampling and Analysis

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Data Quality Objectives for Regulatory Requirements for Hazardous and Radioactive Air Emissions Sampling and Analysis

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Project Hanford Management Contractor for the
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EXECUTIVE SUMMARY

The Data Quality Objective Process was implemented to identify the regulatory drivers for sampling and analysis of River Protection Project facilities to characterize the vapor samples emitted from wastes managed by the River Protection Project at the U.S. Department of Energy's Hanford Site. The River Protection Project is responsible primarily for the storage of waste in the tank farms; waste treatment and disposal will be addressed under a separate contract through the U.S. Department of Energy, Richland Operations Office. The wastes include the contents of single- and double-shell tanks, and inactive miscellaneous underground storage tanks. Previous sampling has indicated that there are radioactive, toxic, and hazardous materials present in the tanks.

Both Federal and State regulatory programs govern the management of the tank waste. Federal regulations for hazardous waste are found under the *Resource Conservation and Recovery Act of 1976* at 40 CFR 260 et seq., while the Washington State Air regulations are found in *Washington Administrative Code* 173-400 through 173-460. The State regulations incorporate the Federal program requirements, along with additional restrictions. Regulations that govern the radionuclide portion of the vapor are found in *Washington Administrative Code* 246-247. Air regulations require that air emissions are determined either through process or analytical knowledge. The Data Quality Objective Process was used to identify regulatory drivers for specific analytical needs and action levels for specific analytes (see Appendix C). The Data Quality Objective process also establishes the universe of facilities for which this process is to be applied.

Section 6.0 contains the decision rules, which describe the consequences if analyses indicate the presence of regulated air constituents in the tank vapor space at levels that exceed the relevant action levels. Section 7.0 describes the methods that will be used to evaluate the results of data analyses. Section 8.0 presents the recommended approach for sample collection and analysis, including the number of samples, analytical methods, and recommendations for analytical and field quality control.

CONTENTS

APPENDICES

ATTACHMENT

*A copy of Attachment I can be obtained from central files by calling 376-5440.

LIST OF FIGURES

LIST OF TABLES

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LIST OF TERMS

CAA	*Clean Air Act of 1990*
CAM	continuous air monitor
CAS#	chemical abstract services number
CFR	*Code of Federal Regulations*
COPC	constituent of potential concern
CPO	Characterization Project Office
DBP	dibutyl phosphate
DCRT	double-contained receiving tank
DQO	data quality objective
DST	double-shell tank
Ecology	Washington State Department of Ecology
EDE	effective dose equivalent
EPA	U.S. Environmental Protection Agency
EPCRA	*Emergency Planning and Community Right-to-Know Act of 1986*
GC/MS	gas chromatography/mass spectroscopy
HAP	hazardous air pollutant
HASQARD	*Hanford Analytical Services Quality Assurance Requirements Documents*
HEPA	high-efficiency particulate air (filter)
IMUST	inactive miscellaneous underground storage tank
LCS	laboratory control sample
LFL	lower flammability limit
LL	liquid level
NA	not applicable
NESHAP	National Emission Standards for Hazardous Air Pollutants
NIOSH	National Institute of Occupational Safety and Health
OGI	Oregon Graduate Institute
P&T	purge and trap
PCB	polychlorinated biphenyl
PQL	practical quantitation limit
PUF	polyurethane foam
Pvap	vapor pressure
QA/QC	quality assurance/quality control
RMCS	rotary mode core sampling
RPD	relative percent difference
RPP	River Protection Project
SST	single-shell tank
STT	sorbent tube train
TAP	toxic air pollutant
TBP	tri-butyl phosphate
TOC	total organic carbon
TST	triple sorbent trap

TWINS	Tank Waste Information Network System
VOC	volatile organic compound
WAC	*Washington Administrative Code*

DEFINITION OF TERMS

Ambient Air. The free flowing air surrounding an object. Ambient air is not air trapped in a container or equivalent.

Fugitive Emissions. Emissions which do not pass and which could not reasonably pass through a stack, chimney, vent, or other functionally equivalent opening.

In Heavy Liquid Service. This term means that the piece of equipment is not in gas/vapor service or in light liquid service.

In Light Liquid Service. This term means that the piece of equipment contains or contacts a waste stream where the vapor pressure of one or more components in the stream is greater than 0.3 kilopascals (kPa) at 20 degree C, the total concentration of the pure components having a vapor pressure greater than 0.3 kPa at 20 degree C is equal or greater than 20% by weight, and the fluid is a liquid at operating conditions.

Major Stack. A stack which hypothetically has the potential to expose an individual of the public to more than 0.1 mrem per year effective dose equivalent.

Minor Stack. A stack which has the potential to emit radionuclides and which is not a major stack.

Process Knowledge. Knowledge about a process derived from understanding what happens, what has happened, and what could be expected to happen during a process. Process knowledge could also include analytical results of varying quality.

PM10. Particulate less than 10 μ in size.

Type I Error. This error occurs when data mislead a decision maker into believing that the burden of proof in hypothesis has been satisfied, to that the null hypothesis is erroneously rejected (also called alpha error). For this project, the hypothesis is that the action levels are exceeded. A Type I Error is determining that the air limits are not exceeded when the limits have actually been exceeded (EPA 1994).

Type II Error. This error occurs when data mislead a decision maker into wrongly concluding that the burden of proof in a hypothesis test has not been satisfied so that the null hypothesis is accepted (also called beta error). For this project, the hypothesis is that the action levels are exceeded. A Type II Error is determining that the air limits are exceeded when the limits have actually not been exceeded (EPA 1994).

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1.0 INTRODUCTION

1.1 BACKGROUND AND SCOPE

This document describes the results of the data quality objective (DQO) process undertaken to define data needs for state and federal requirements associated with toxic, hazardous, and/or radiological air emissions under the jurisdiction of the River Protection Project (RPP). Hereafter, this document is referred to as the Air DQO.

The primary drivers for characterization under this DQO are the regulatory requirements pursuant to Washington State regulations, that may require sampling and analysis. The federal regulations concerning air emissions are incorporated into the Washington State regulations.

Data needs exist for nonradioactive and radioactive waste constituents and characteristics as identified through the DQO process described in this document. The purpose is to identify current data needs for complying with regulatory drivers for the measurement of air emissions from RPP facilities in support of air permitting. These drivers include best management practices; similar analyses may have more than one regulatory driver. This document should not be used for determining overall compliance with regulations because the regulations are in constant change, and this document may not reflect the latest regulatory requirements. Regulatory requirements are also expected to change as various permits are issued. Data needs require samples for both radionuclides and nonradionuclide analytes of air emissions from tanks and stored waste containers. The collection of data is to support environmental permitting and compliance, not for health and safety issues.

This document does not address health or safety regulations or requirements (those of the Occupational Safety and Health Administration or the National Institute of Occupational Safety and Health [NIOSH]) or continuous emission monitoring systems.

This DQO is applicable to all equipment, facilities, and operations under the jurisdiction of RPP that emit or have the potential to emit regulated air pollutants.

1.2 DATA QUALITY OBJECTIVES

The objectives of this Air DQO process are to identify

- the analytes which are needed to address regulatory air emission issues. Analytes include those which are known or potentially present in vapor spaces,
- which analytes to test via sampling and laboratory analyses, and
- the appropriate analytical methods that provide acceptable detection capability and quality.

1.3 SCHEDULE

Data shall be obtained at the next sampling event. All data shall be collected within the next 5 years from the date of publication of this Air DQO or sooner if changes have occurred which may materially affect emissions. A periodic review of the status of equipment will verify that previous assumptions are still current.

1.4 DATA QUALITY OBJECTIVE PROCESS

The RPP DQO process is implemented per guidance based on the U.S. Environmental Protection Agency's (EPA) DQO Process document (EPA 1994) as implemented in the RPP DQO Process (Banning 1997). This Air DQO document will be revised as new information warrants.

1.5 APPROACH TO ANALYTE SELECTION AND ANALYSIS

Analytes considered under the scope of this Air DQO were selected from a large universe of regulated constituents using a technically defensible decision logic. The logic selected regulated compounds plausible to be in vapor space samples based on regulatory requirements. A specific list of constituents of potential concern (COPCs) was prepared for each regulatory driver. It is envisioned that this analyte selection process will be one in a series of such processes to identify analysis needs in support of permitting for regulatory compliance.

Table 1-1 lists the regulatory drivers for air sampling and identifies their applicability to the existing facilities. (Table 1-1 should be reviewed with Section 3.0.) Table 1-2 lists regulations that apply only when data (i.e., analytical results) exist that show the presence of the regulated compound. These regulations are for reporting requirements, however, they do not drive analytical requirements. (Table 1-2 should be reviewed with Section 3.1.) Table 1-3 presents the permit for rotary mode core sampling (RMCS). Should this device be used at RPP for sampling, the cited permit is in effect and the process for estimating emission values as outlined in DOE-RL (1997 and 1998a) should be followed. (Table 1-3 should be reviewed with Section 3.3.)

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Table 1-1. Regulatory Drivers for Air Permitting.[a] (2 Sheets)

Citation of Regulatory Driver	Title of Regulatory Driver	Specific Equipment Covered under Regulatory Driver	Applicable to RPP?		Regulatory Driver Description in Section	Analyte List Associated?
			SST/ DST/ DCRT	IMUST		
WAC 246-247; 40 CFR 61, Subpart H 246-247-075(8); 246-247-110(8)	Radiation Protection – Air Emissions	Applies to all radioactive air emissions; addresses minor and major stacks.	Yes	Yes	3.2	Yes

*For facilities with a RCRA Part B permit, 40 CFR 264 applies instead of 40 CFR 265

[a]Table should be reviewed with Section 3.0.

[b]These regulations only apply if IMUST contains >10% by weight organics.

[c] Not applicable because composition of IMUST changes and permit applies to existing tank waste.

CFR = *Code of Federal Regulations*
DST = double-shell tank
DCRT = double-contained receiving tank
HAP = hazardous air pollutant
IMUST = inactive miscellaneous underground storage tank
ppmw = parts per million by weight
SST = single-shell tank
WAC = *Washington Administrative Code*

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2.0 PROBLEM STATEMENT

This document identifies air sampling and analysis requirements needed to address environmental regulatory demands for the RPP facilities. Previous studies and analytical results indicate that toxic and hazardous vapors are generated and released from Hanford Site SSTs and DSTs and waste processing facilities (Huckaby and Story 1994, Jansky and Meissner 1983, and Van Slyke 1994). Two tank vapor DQO studies have been conducted to address health and safety (Osborne and Buckley 1995, Turner et al. 1995). The studies and analyses were designed to address safety issues and were not designed to address environmental regulatory requirements. Analytical results from these safety-based issues which were placed in the Vapor Characterization Database of the Tank Waste Information Network System (TWINS) indicate the presence of chemicals that are regulated under one or more environmental statutes or regulations. The following regulatory drivers are described in detail in Section 3.0:

- Toxic air pollutant (TAP) lists Class A (WAC 173-460-150) and Class B (WAC 173-460-160).
- Operating Permit Regulations (WAC 173-401), including the HAPs.
- Air Emission Standards for Process Vents (40 CFR 265, Subpart AA).
- Air Emission Standards for Equipment Leaks (40 CFR 265, Subpart BB).
- Air Emission Standards for Tanks, Surface Impoundments, and Containers (40 CFR 265, Subpart CC).
- General Regulations for Air Pollution Sources (WAC 173-400).
- Radiation Protection – Air Emissions (WAC 246-247).

The RPP facilities that emit or have the potential to emit toxic, hazardous, or radioactive compounds are listed in Appendix B. Historical data obtained from opportunistic sampling are used to validate emission calculations. The vapor sampling program has sampled several tank vapor spaces for safety-related issues, but differences between safety and environmental regulations may require additional sampling and analyses. This document provides guidance for the sampling and analyses that are needed to meet environmental regulatory drivers of regulated air pollutants emitted from RPP facilities.

The approach of this document is to address the regulatory compounds, which plausibly are present in tank and container vapor spaces at RPP. This provides a global coverage of the regulatory aspects that need to be met for permitting issues. If a specific case can document that certain compounds are not present, either through analysis, delisting efforts, documented professional judgment or process knowledge, the list of COPCs in Appendix C can be modified. This document identifies the applicable environmental regulatory drivers for air sampling, and when analysis should be obtained. It also identifies specific analytes and quality

assurance/quality control (QA/QC) procedures and emission limits. This document should complement and be consistent with Osborne and Buckley (1995) and Turner et al. (1995), while still satisfying air emission regulatory requirements and data needs.

3.0 DECISIONS/QUESTIONS

A decision needs to be made whether sampling and analysis of a particular piece of equipment is required and/or desired to quantify airborne emissions from RPP facilities. Emissions may need to be quantified or estimated to:

- report air emissions to regulatory agencies,
- determine compliance with emission standards,
- determine whether a specific environmental requirement applies to the emission point, or
- establish an emissions baseline that can be used for permit preparation, emission trading, or to offset increased emissions from a new or modified source.

3.1 NONRADIOACTIVE AIR EMISSIONS

For the nonradioactive air emissions, an evaluation is needed to address whether air sampling is needed. The radioactive air emissions are addressed in Section 3.2.

Each one of the questions below will be addressed in the following sections for each regulatory driver. The pertaining regulatory issues will be discussed and the list of compounds for the specific regulatory driver is presented in Appendix A. The discussions in Section 4.0 lead to the applicable list of COPCs, presented in Appendix C. The results of the discussion for each type of equipment have been written as decision statements and the implementation of these statements was used to produce the sampling and analysis designs in Section 8.0.

- Is the air emission unit permitted as, or should it be permitted as, an Insignificant Emissions Unit?
- Is the quantification of the air emission needed as part of an annual report or as required by a permit?
- Is the air emission due to an equipment leak?
- Is the air emission part of a DST, SST, surface impoundment, or container?
- Is the air emission due to a new or modified source?

TAPs and HAPs may be emitted from RPP facilities and are identified in the following sections. Concentration limits are difficult to establish for the specific chemicals which are regulated as TAPs and HAPs in WAC 173-460-150 (toxic), WAC 173-460-160 (toxic), and WAC 173-401-531 (hazardous) because regulations limit mass emissions, which make concentration limits a function of the emission flowrate. Concentration limits are also difficult to establish because the allowed emission rates are either hourly or annual averages (as shown in

WAC 173-460-080). Section 8.0 discusses how a detection limit was derived for toxic organic compounds.

The TAPs and HAPs listed in the COPC list in Appendix C need to be sampled and/or analyzed unless emissions have already been determined. The COPC list is based on the analyte selection logic in Section 4.0 and can be limited if process knowledge or some other defendable method supports particular pollutants not being present. The rationale for identifying and quantifying air pollutants is threefold:

- to establish a baseline for emission trading and/or offsets,
- to perform a best available control technology analysis when a change is proposed for the effluent flowrate, and
- to determine changes in emissions because of modifications.

To determine whether analytical data are needed, a decision logic should be used for each RPP unit.

3.1.1 WAC 173-400, General Regulations for Air Pollution Sources

This set of regulations establishes general requirements for air pollution sources and sets forth the requirements to obtain permits according to WAC 173-401. Included in this section are requirements for estimating emissions for submittal in reports such as the annual report required by WAC 173-400-105(1). Emission estimates are also used for determining fees (WAC 173-400-104). Actual emission testing is generally not required and emission estimates can be made using techniques such as mass balance, engineering calculations and process knowledge (WAC 173-400-103(1)). These general requirements are superseded by specific conditions that may appear elsewhere in the air program.

Whenever an existing air pollution source is to be modified or before a new air pollution source can be constructed, an evaluation of the impacts of the emission change is required. WAC 173-400-110 sets forth the requirements for new source review. Generally a source subject to these requirements must apply for a permit if its potential emissions may exceed the limits contained in table 3-1 unless the source qualifies for an exemption. The pollutants listed include the compounds listed in 40 CFR 50 and in the TAPs from WAC 173-460.

Table 3-1. WAC 173-400 Pollutant Threshold.

Pollutant	Threshold Level (tons per year)
Total Suspended Particulates	1.25
PM10	0.75
Sulfur Dioxide	2.0
Nitrogen Oxides	2.0
Total Volatile Organic Compound (VOC)	2.0
Carbon Monoxide	5.0
Lead	0.005
Ozone depleting substances in aggregate	1.0
TAPs	As specified in WAC 173-460 (see Appendix C)

3.1.2 WAC 173-401 (Operating Permit Regulations)

These regulations specify the requirements for obtaining any permits, which are required by WAC 173-400. Because certain activities and changes are exempt from the requirement to obtain a permit, it is important to establish whether any exemptions apply to the planned activity (WAC 173-401-530). One key exemption is the criteria for deeming that a change or a new source is insignificant. This is used as the basis for the following requirement and for the decision logic shown in Figure 3-1.

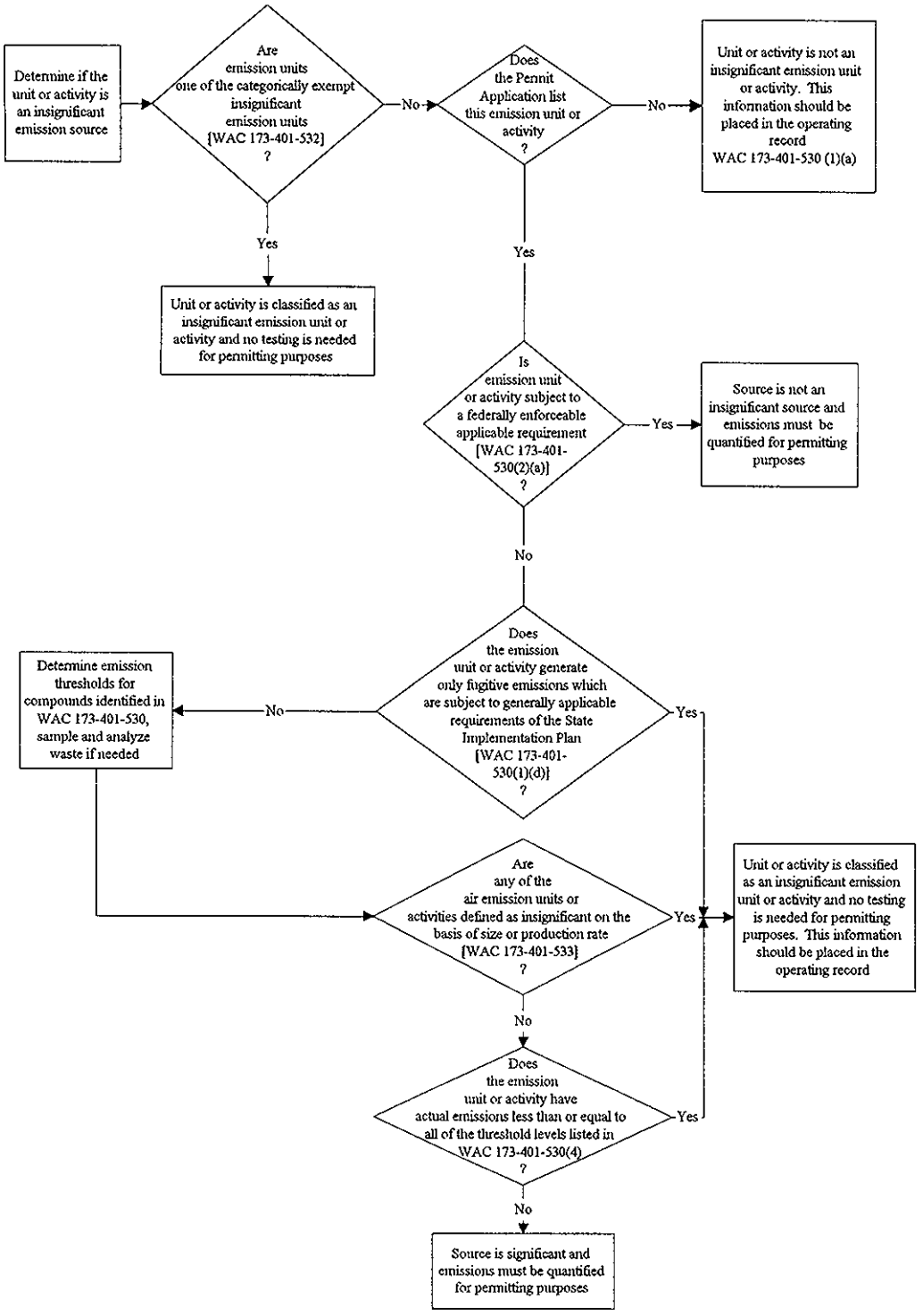
The list of HAPs is included in Appendix C.

Result.

1. If the air emission unit or activity qualifies as an insignificant emission unit, and if analytical results and/or other documentation can substantiate this determination, sampling is not required for permitting purposes.

2. If the unit does not qualify as an insignificant emission unit, or if insufficient data exist to support this determination, estimation of emissions is required. Calculated emission rates should be verified by sampling when feasible.

Figure 3-1. Decision Logic – Insignificant Emission (WAC 173-401).



3.1.3 WAC 173-460 (Controls for New Sources or Major Modifications of Existing Sources of Toxic Air Pollutants)

The TAP lists include carcinogenic and noncarcinogenic toxic compounds. The compounds in the TAP lists were promulgated by the Washington State Department of Health for regulation of air pollutants. Class A pollutants are known and probable carcinogens listed in WAC 173-460-150. The Class B pollutants are toxic compounds listed in WAC 173-460-160 and include substances that are not simple asphyxiant or nuisance particulates. The Class A and B compounds are used by the State of Washington in regulating offgas emission control systems.

WAC-173-460-050 requires that emissions of TAPs be quantified prior to modifying an existing source or constructing a new source. Quantification may be based on process knowledge or estimates of emissions based on good engineering judgement. Modifications to an existing source include any action that may increase the amount of a pollutant emitted or that results in emission of an air pollutant not previously emitted. Modifications do not include variations in emission rates resulting from normal and historical operation unless they are not in accordance with a specific permit limit. A flowchart of the decision logic is shown in Figure 3-2.

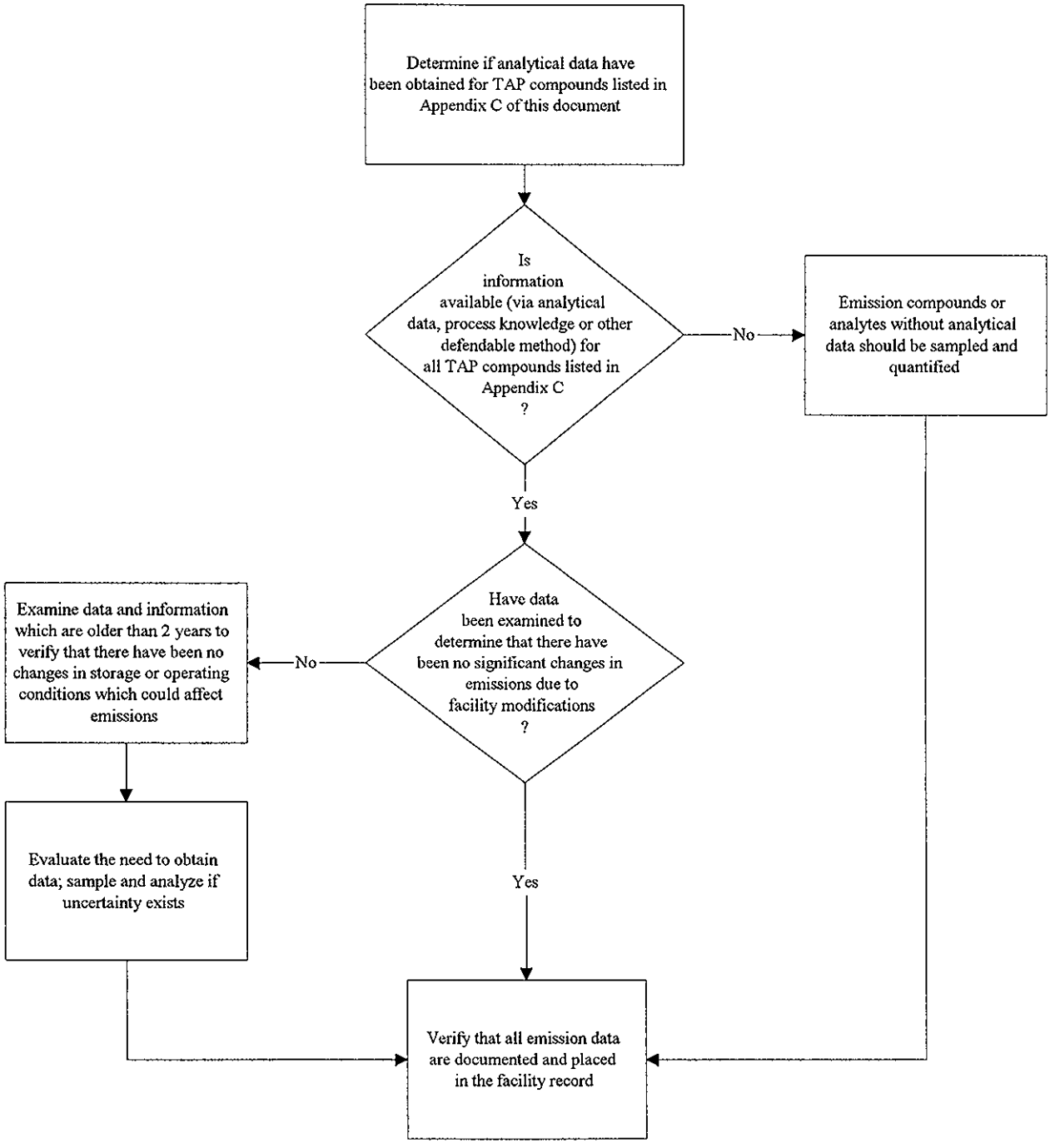
3.1.3.1 Requirement. Determine whether analytical data have been obtained to account for all TAP compounds listed in Appendix C, Table C-1, for emission sources that have been modified or may be modified or constructed. Acceptable analytical data include information on a compound that has been analyzed. A compound cannot be considered nondetected if it was not analyzed by the appropriate analytical method.

1. Determine whether data are available for all TAP compounds listed in Appendix C, Table C-1, using process knowledge, past sample analyses, or another defendable method.

2. Examine the data and determine whether changes in operations or other factors might have caused a significant change in emissions. Items which could trigger significant changes include the following: new waste types being processed or stored, and changes in storage or operating conditions. If it can be substantiated that the data are representative of the source, these data can be used rather than obtaining additional data. If emissions may have changed, new emission data should be obtained.

3. Verify that emission data are documented and inserted in the facility operating record [WAC 173-400-105(1)].

Figure 3-2. Decision Logic – Controls for New Sources of Toxic Air Pollutants (WAC 173-460).



3.1.3.2 Result.

1. If analytical data or substantial estimates have been obtained previously or developed for all TAP compounds listed in Appendix C, Table C-1, no further analysis is needed for reports.

2. If analytical data or substantial estimates have not been obtained or developed for all compounds, emission sources with missing analytical data should be sampled and emissions quantified.

3.1.4 40 CFR 265, Subpart BB (Air Emission Standards for Equipment Leaks)

Treatment, storage, and disposal facilities must comply with this regulation of 40 CFR 264, Subpart BB (interim status published in 40 CFR 265, Subpart BB) if associated equipment contains or contacts hazardous wastes, with organic concentrations of at least 10 ppmw (§264.1050(b)).

Fugitive emission controls and monitoring are required for specified equipment that contacts or contains hazardous waste with an organic content greater than 10% by weight. Requirements include monitoring the equipment for leaks through visual and/or instrumentation inspection and specified repair requirements. Requirements vary according to the type of equipment and the organic content of the waste. To determine whether a piece of equipment is subject to this regulation, the following decision logic should be used. Presently at RPP, the tanks of known content do not contain organic waste of 10% weight or more and, therefore, do not fall under this regulatory driver. This regulation is listed here to ensure documentation of the organic content. A flowchart of the decision logic is shown in Figure 3-3. All decision logic should be viewed simultaneous with the following description.

The following sections provide the decision logic. Decision steps are organized by priority and in the most logical and efficient sequence for analyzing and answering the question.

3.1.4.1 Requirement. Determine whether an equipment leak is subject to air emission standards outlined in 40 CFR 265, Subpart BB.

1. Determine whether equipment is or contains a pump, pressure relief device, compressor, sampling connector, or valve (§265.1050, 265.1053, 265.1055, and 265.1056).

2. Obtain available analytical results or use documented process knowledge to determine whether the equipment contains or contacts organic hazardous waste greater than 10% by weight (§265.1050(e)).

3. Determine whether equipment is handling organic liquids that are classified as gas/vapor, light or heavy liquid service (§265.1057, 265.0158, 265.1061, and 265.1062).

3.1.4.2 Result.

1. If analytical results or process knowledge are available, determine whether the liquid waste is hazardous and contains greater than 10% organic concentration by weight. Document the information. No further analysis is required.

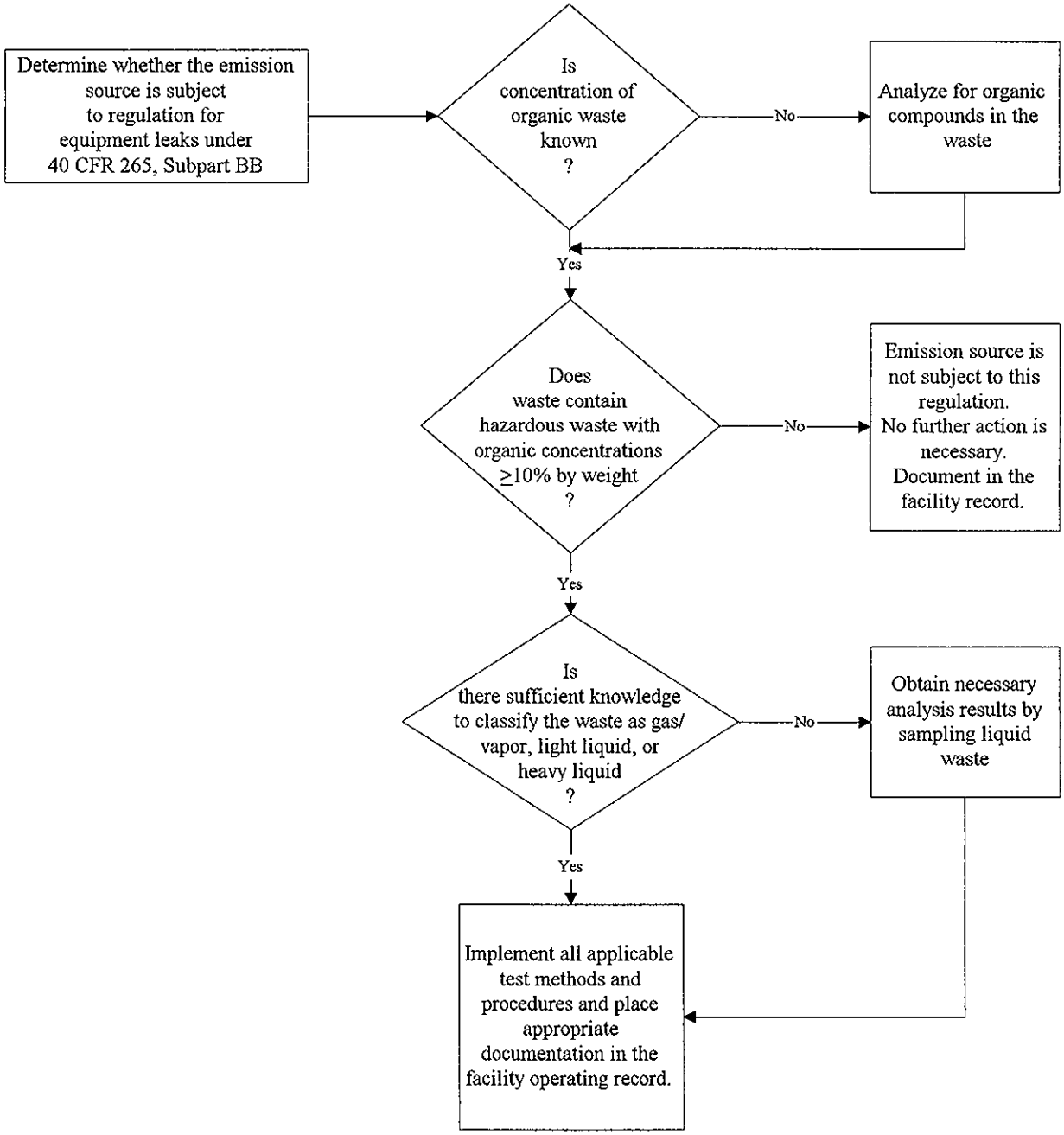
2. If analytical results or process knowledge are not available, sample the liquid waste source and analyze by SW-846 (EPA 1997), Methods 8260B and 8270C, to obtain necessary analytical information about the total organic content (§265.1063(d)).

3. If the waste contains organic concentrations that exceed 10% by weight, implement all applicable test methods and procedures and perform any required air emission monitoring (§265.1063(b)).

3.1.5 40 CFR 265, Subpart CC (Air Emission Standards for Tanks, Surface Impoundments, and Containers)

The 40 CFR 265.1086 and 265.1087, Subpart CC, requirements apply to containers with design capacity larger than 0.1 m^3 (26.4 gal) that manage hazardous waste that, at the point of waste origination, had a volatile organics content greater than or equal to 500 ppmw, and that are not expressly exempted from the rule (§265.1083(c)).

Figure 3-3. Decision Logic – Air mission Standards for Equipment Leaks (40 CFR 265, Subpart BB).



This regulation controls organic emissions from tanks, surface impoundments, and containers at facilities that treat, store, or dispose of hazardous waste. Equipment that solely handles mixed waste is exempted from this regulation (§265.1080(b)(6)) and most of the waste stored at RPP is expected to meet this exemption. Equipment is not subject to some of the requirements of this regulation if the average volatile organic concentration of the hazardous waste at the point of waste origination is less than 500 ppmw (§265.1083(c)(1)); or if the organic content of the waste has been treated to less than 100 ppmw as specified in 40 CFR 265.1083(c)(2)(ii). To determine whether analyses are needed to decide whether equipment is subject to this regulation, the decision logic illustrated in Figure 3-4 should be used. At RPP, the presently used tanks meet one or more of the exemption criteria. This regulation is listed here in case waste is accepted that does not meet the above exemption requirements.

3.1.5.1 Requirement. Determine whether the tank, surface impoundment, or container is subject to regulation under 40 CFR 265, Subpart CC.

1. Determine whether the waste management unit qualifies under any exemption listed in 40 CFR 265.1080(b).

2. Determine whether the average volatile organic concentration at the point of hazardous waste origination is less than 500 ppmw using the procedure specified in 40 CFR 265.1084(a) or through process knowledge or analysis. For analysis, use SW-846 (EPA 1997), Methods 8260B and 8270C.

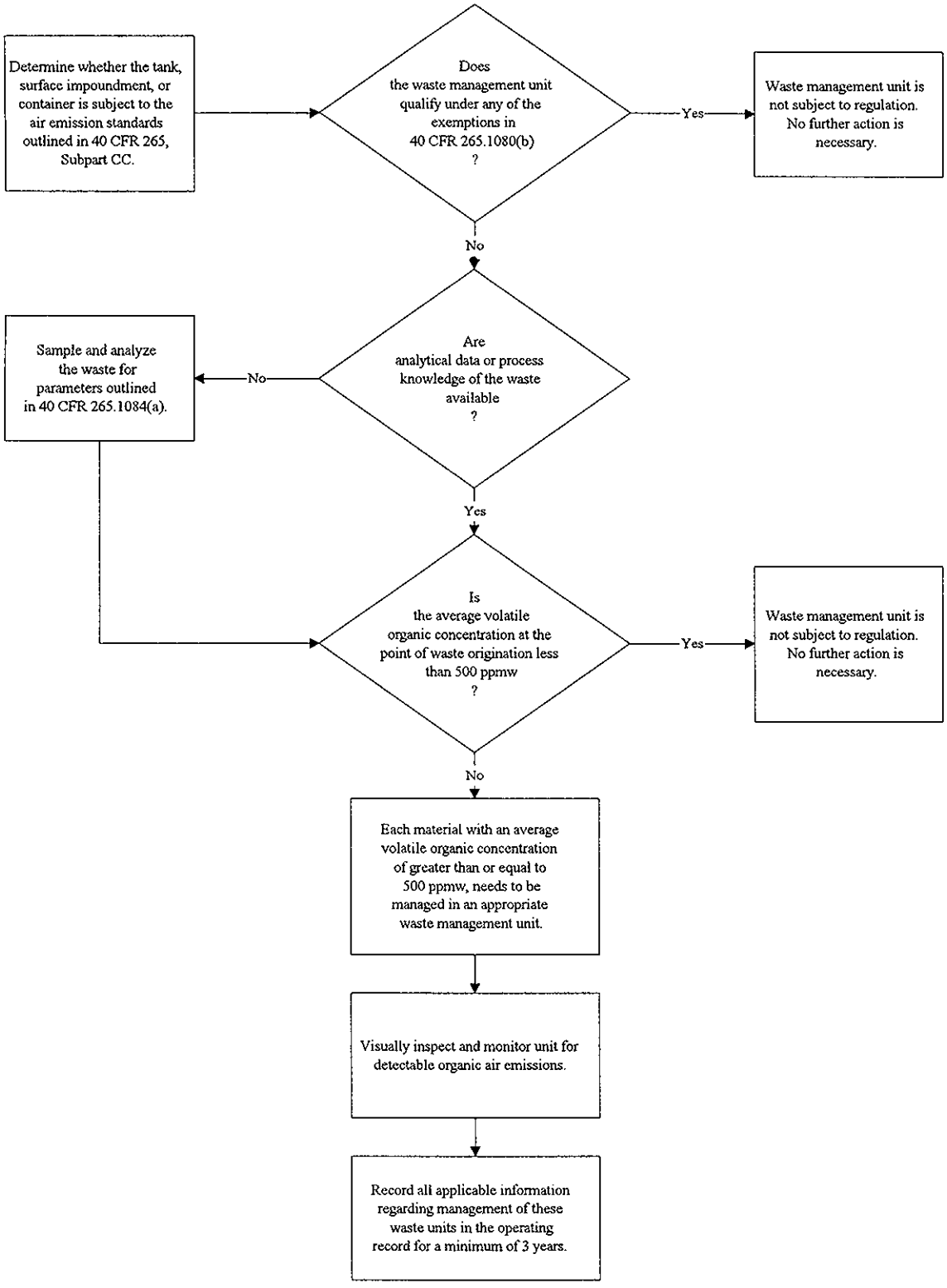
3.1.5.2 Result.

1. If the waste management unit qualifies under the exemptions outlined in 40 CFR 265.1080(b), no analysis is required.

2. If the unit does not qualify for an exemption but is thought to have an organic content less than 500 ppmw, conduct analyses to confirm the organic content.

3. If the unit is subject to this regulation, no continuing analyses are required as long as specified controls are in place.

Figure 3-4. Decision Logic – Air Emission Standards for Tanks, Surface Impoundments, and Containers (40 CFR 265, Subpart CC).



3.1.6 Applicable Regulations for Detected Toxic and/or Extremely Hazardous Air Contaminants

For air emissions containing extremely hazardous or toxic compounds, two federal regulations apply. These regulations were put in place to protect the public, and to establish a pathway for reporting involuntary releases of such hazardous or toxic chemicals. Neither one of the regulations drives analytical requirements and, therefore, was not included in the list of COPCs for this DQO. Reporting to the authorities is required should any of these compounds exist in the vapor samples above a certain threshold.

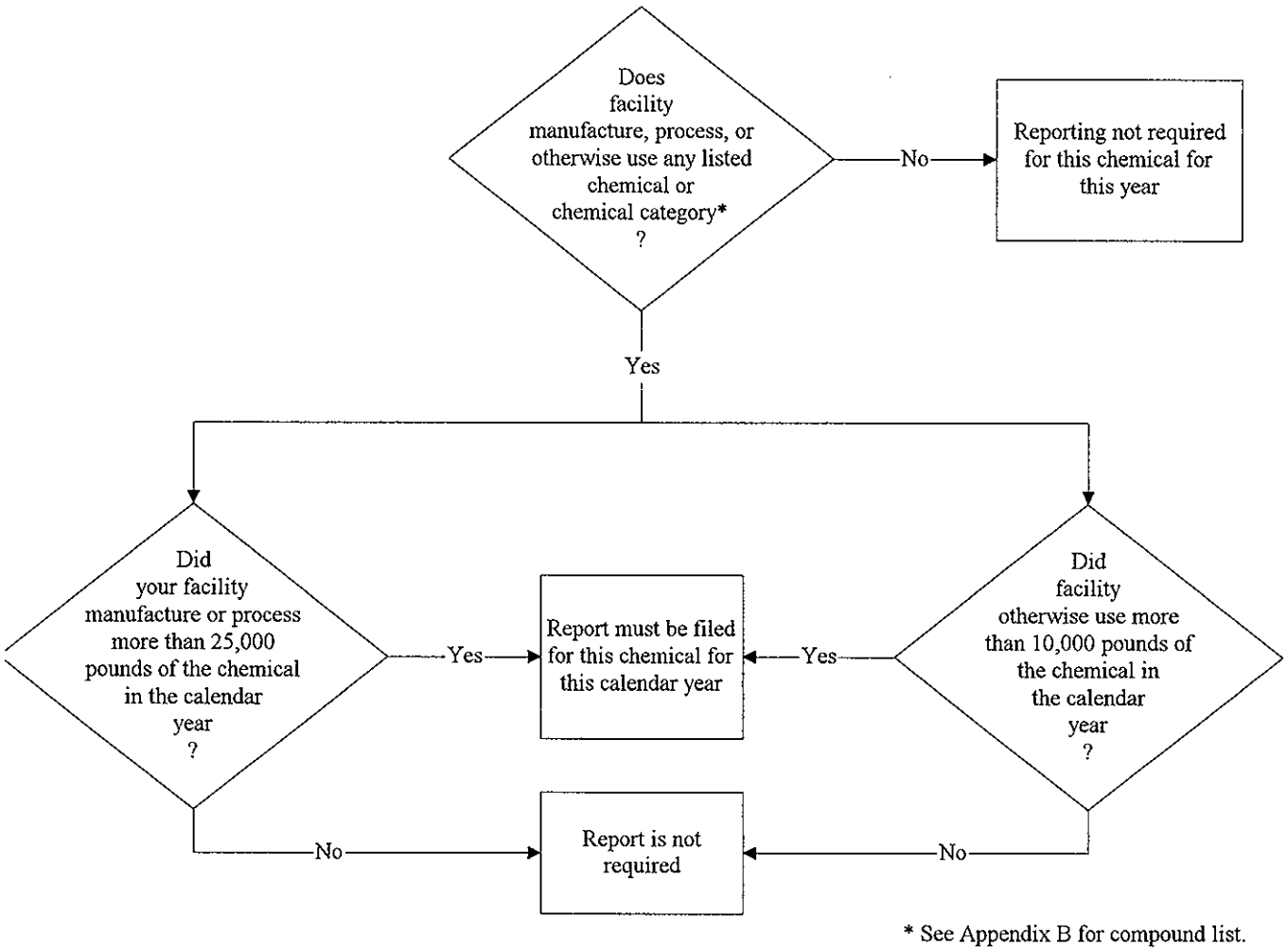
3.1.6.1 40 CFR 372 (Annual Air Emission Reporting). This section of 40 CFR 372 was published February 16, 1988, and sets forth requirements for the submission of information relating to the release of toxic chemicals. 40 CFR 372 is based on the requirements set out in Section 313 of Title III of the *Superfund Amendments and Reauthorization Act (SARA) of 1986*. The information collected under this part is intended to inform the general public and the communities surrounding covered facilities about releases of toxic chemicals, to assist research, to aid in the development of regulations, guidelines, and standards and for other purposes. This list contains the majority of known pesticides and other semi-volatile compounds.

40 CFR 372 also implements EPCRA, however, the EPCRA compounds with the regulatory thresholds are listed in 40 CFR 355, and are discussed in Section 3.1.6.2 of this DQO. The compounds are listed in Appendix A of this DQO. The extremely hazardous substances listed in EPCRA are different from the toxic compounds listed in 40 CFR 372.

The decision logic in Figure 3-5 should be followed to determine whether additional information should be obtained.

> *Note: "Manufacture" includes reactions of chemicals with existing waste. "Process" includes preparing neutralization solutions for the tanks. "Otherwise use" includes everything else. It does not include disposal and stabilization, unless it has been performed on offsite waste. "Facility" encompasses all facilities at the Hanford Site as one. Regulatory staff needs to be consulted when evaluating emission rates.*

Figure 3-5. Decision Logic – Annual Air Emission Reporting (40 CFR 372).



Requirement. From each emission unit, evaluate available data for quantifying emissions of compounds listed in 40 CFR 372. No analyses are required for this step.

Results. If a facility manufactured or processed more than 25,000 lb of the chemical, or otherwise used more than 10,000 lb of the chemical, an annual report must be filed.

3.1.6.2 40 CFR 355 (Emergency Planning and Community Right-to-Know Act of 1986). The Federal EPCRA is implemented through the regulations in 40 CFR 350, 40 CFR 355, 40 CFR 370, and 40 CFR 372. Section 355 of 40 CFR lists the compounds applicable to EPCRA and applicable to industries. If any facility or operation knows or suspects to have any of the compounds, the community needs to be informed. The EPCRA requires reporting certain chemical emissions when they exceed a specified threshold. Emissions from each unit are aggregated to determine whether a threshold has been exceeded. Because the

Hanford Site is considered one facility to which EPCRA applies, emission thresholds could be exceeded because of the number of units handling relatively small amounts of the same chemical.

The EPCRA does not require additional monitoring or measurement of the quantities or concentrations of any toxic chemical beyond that required by other laws or regulations, but it does require that emissions over a certain threshold be reported and quantified. This quantification does not have to be based on analysis, it can use other methods such as emission calculations. Generally, it is desirable to obtain at least limited sample data to support calculated numbers. This is especially true if information can be obtained at little or no additional cost, or if cumulative emissions are near the reporting threshold.

The decision logic illustrated in Figure 3-6 should be followed to determine whether additional information should be obtained.

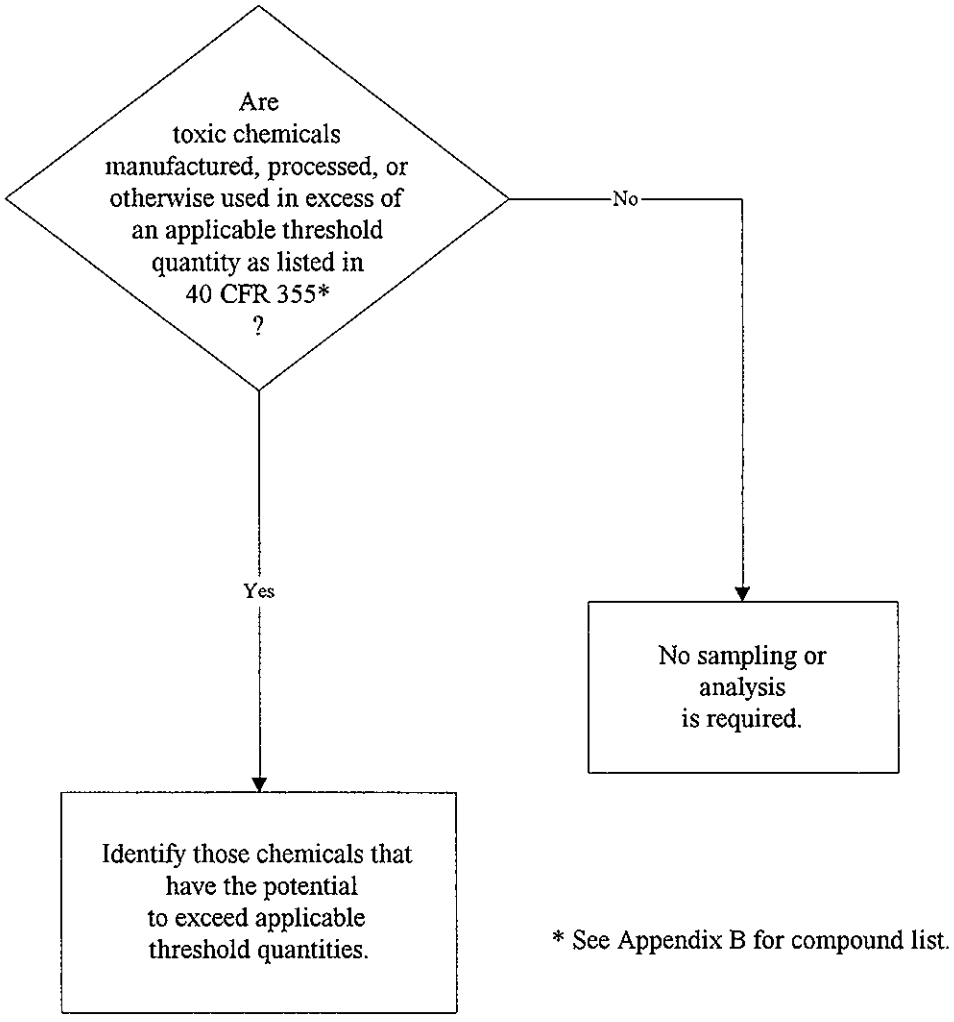
Requirement. From each emission unit, evaluate available data for quantifying emissions of compounds listed in 40 CFR 355, Appendices A and B. No analyses are required for this step.

Results. If chemical concentrations present are below the minimum levels listed in 40 CFR 355, no requirement exists to consider the quantity of the toxic chemical present in such a mixture, when determining whether an applicable threshold has been met under 40 CFR 355.

3.1.7 40 CFR 265, Subpart AA (Air Emission Standards for Process Vents)

The regulations in this subpart apply to process vents associated with distillation, fractionation, thin-film evaporation, solvent extraction, or air or steam stripping operations that manage hazardous waste with organic concentrations of at least 10 ppmw (§265.1030(b)). The evaporators at the Hanford Site possibly could be subject to this regulation; however, they are not included in the scope of this Air DQO. Therefore, no further discussion of this section is provided.

Figure 3-6. Decision Logic – *Emergency Planning and Community Right-to-Know Act of 1986* (40 CFR 355).



3.2 WAC 246-247 (RADIOACTIVE AIR EMISSIONS)

Standards and requirements for the emission of radionuclides are contained in WAC 246-247 and 40 CFR 61, Subpart H. Because requirements depend on the level of emissions, radionuclide emissions from RPP units must be quantified. Permissible quantification methods for certain stacks or vents with a significant potential for emissions are outlined in 40 CFR 61, Method 114.

Federal regulations (40 CFR 61, Subpart H) require that:

> *"Radionuclide emission measurements in conformance with the requirements of paragraph (b) (i.e., continuous monitoring) of this section be made at all release points which have a potential to discharge radionuclides into the air in quantities which could cause an effective dose equivalent (EDE) in excess of one percent of the standard."*

The standard is 10 millirem per year (mrem/yr); 1% of that is 0.1 mrem/yr effective dose equivalent (EDE). The potential to discharge is defined as emissions which would occur in the absence of all pollution control equipment during normal facility operation. At the Hanford Site, these controls may consist of one or more banks of high-efficiency particulate air (high-efficiency particulate air [HEPA]) filters. The NESHAP determinations have been performed and are documented in Crummel (1995).

It is necessary to quantify radionuclide emissions to determine monitoring and testing requirements for compliance with NESHAP. Table 3-3 lists the analytes which should be measured in order to quantify radioactive air emissions. The table includes gross alpha and gross beta which are used to verify that a source is not emitting large quantities of radionuclides other than americium-241, plutonium-239/240, cesium-137, or strontium-90.

Table 3-2. Radioactive Air Analytes Detected or Suspected of Being Released from Tank Farm Transition Project Facilities.

Radioactive Air Analytes*
Gross alpha
Gross beta
Cesium-137
Americium-241
Plutonium-239/240
Strontium-90

*Speciation of any nuclide contributing >10% of potential EDE for major stacks.

3.2.1 Minor/Major Stacks

Radionuclide emission units having the potential to emit equal to or greater than 0.1 mrem/yr of the potential EDE are considered major stacks. Speciation of radionuclides is required for all major stacks and is subject to NESHAP requirements. Minor stacks are emission sources that have potential to emit <0.1 mrem/yr EDE. Individual speciation is not required for minor stacks; however, periodic confirmatory measurements are required and record sampling is used to fulfill this requirement. Further information can be found in Crummel (1997). To determine the analytical requirements for radionuclides, the decision logic in Figure 3-7 should be used.

3.2.1.1 Requirements. Determine whether radionuclides are potentially emitted to the air from RPP facilities.

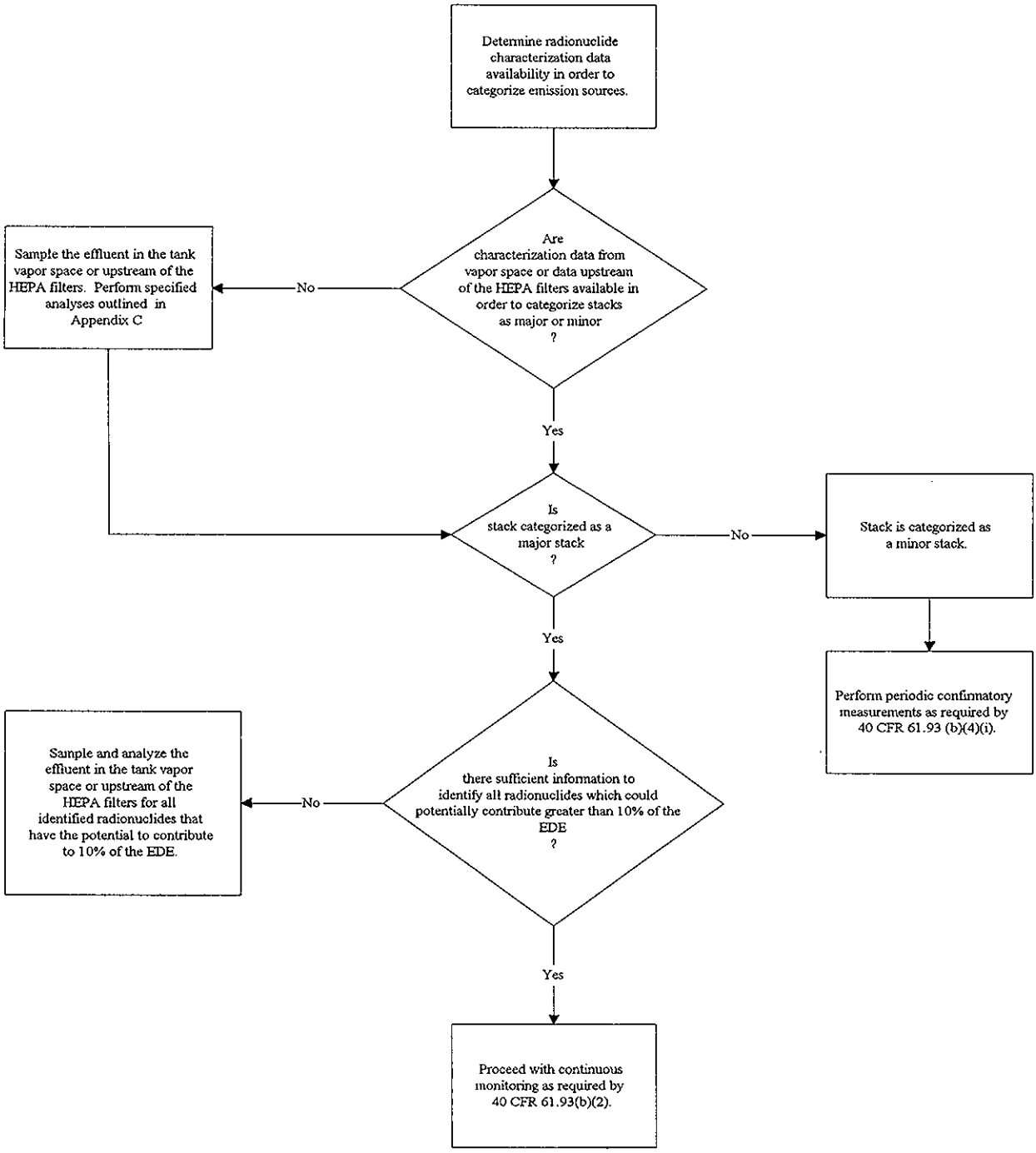
1. Obtain sufficient information to classify the emission unit as a major ($\geq$ 0.1 mrem/yr EDE) or a minor (<0.1 mrem/yr EDE) stack (WAC 246-247-075).

2. Identify all specific radionuclides that could contribute greater than 10% of the total EDE to maximally expose the public if the stack is designated as a major stack. For further information refer to WAC 246-247-110(8).

3. Determine whether NESHAP-compliant continuous monitoring is being performed for major stacks.

4. Verify that emissions from minor stacks are undergoing periodic confirmatory measurement, as required.

Figure 3-7. Decision Logic – Radioactive Air Emissions (WAC 246-247).



3.2.1.2 Results.

1. If characterization data from the tank vapor space or upstream of the HEPA filters or other approved methods are available to classify the emission unit as major or minor stack, no measuring or testing is required unless speciation is needed for the major stack.

2. If characterization data from the tank vapor space or upstream of the HEPA filters or other approved data are not available to classify emission units as major or minor stack, measuring or testing for radionuclides as listed in Table 3-4 is required.

3. If information is available for major stacks or vents to identify all radionuclides that could contribute greater than 10% of the EDE, additional measurement is not required.

4. If information is not available to calculate the EDE, measure tank vapor space or air upstream of the HEPA filter or use other approved method to obtain identified radionuclides that have the potential to contribute to 10% of the EDE.

5. If a major stack is being continuously monitored in compliance with the NESHAP continuous emission measurement criteria, no additional analysis is required.

6. If minor stacks are not being periodically monitored, perform the required periodic confirmatory measurement on at least an annual basis.

3.2.2 Rotary Mode Core Sampling Air Emissions Permit

As discussed in Section 3.1.2, permits are required for changes that could increase emissions. Because the construction of rotary mode core sampling (RMCS) systems 3 and 4 and the modification of system 2 could increase emissions, a permit was required. The permit Ecology issued for these modifications requires that TAP emissions (see WAC 173-460, Section 080) be determined before RMCS sampling. It further specifies how TAP emissions must be calculated. Continuous monitoring is required for TAPs that may be emitted at a rate equal to or greater than 50 percent of the small quantity emission (SQE) rate. The approval prohibits exceeding the SQE without prior agency approval. In addition to restricting TAP emissions, the approval also limits volatile organic compound (VOC) emissions from the RMCS exhauster to 3 pounds per day on a daily average.

To determine whether analytical data are needed, the decision logic in Figure 3-7 should be used for each sampling activity. Decision steps are organized by priority and in the most logical and efficient sequence for analyzing and solving the problem.

Required Analytes for Analysis. The analyte list is the same as the TAPs list provided in Appendix C, Table C-1 of this document. For details on calculating emissions to determine if

continuous monitoring is required, refer to DOE-RL (1998a).

When analyzing the vapor space for TAP compounds, using a GC/MS method such as SW-846 method 8260 or 8270, the laboratory shall report tentatively identified compounds (TICs) above 10% of the nearest internal standard. It should be remembered that many of these compounds are regulated at the parts per billion levels and emission rate is dependent upon flowrate. If the TAP concentration is close to the action level, the laboratory shall make a strong effort to positively identify the compound by using the appropriate calibration standard.

4.0 INPUTS

4.1 SUMMARY OF ANALYTE SELECTION LOGIC

This section defines the decision logic constructed and implemented as a part of the Air DQO process for selection and prioritization of regulated analytes to be characterized in vapor space samples. The logic provides a technically defensible basis for evaluating the potential presence of the regulated compounds in vapor and provides prioritization for analysis based on stability and toxicity.

The logic is described briefly here and described in more detail in subsequent sections. The logic involves three primary decision steps:

1. What are the regulated analytes to consider as inputs to the logic?

2. Are the regulated analytes specific to industries not associated with activities at the Hanford Site?

3. Are the regulated analytes expected to be present and/or stable in the vapor space sample?

The first step results in a set of regulated constituents for consideration. The subsequent steps focus on identifying those compounds which have further data needs which may be met through sampling and analysis. The following discussion will first present the logic for selection of organic constituents. The rationale for selection of inorganic and organometallic compounds and test parameters are described in Section 4.9.

Process knowledge was used in four areas of the logic:

- the historical data from previous tank vapor sampling were used in the inputs to identify regulated and detected analytes,

- knowledge of processes used at the Hanford Site was used to identify analytes not associated with the Hanford Site,

- reaction chemistry in vapor space, based on general literature information, and previous analyses of tank vapor samples were used to assess the stability of compounds in the air, and

- physical properties of the regulated compounds were used to determine if a compound was nonvolatile and would not be emitted in significant quantities.

An input list was created from the analytes identified by the regulatory drivers listed in Section 3.0. To manage these compounds in a logical fashion, constituents were grouped together into organic constituents, and inorganic compounds and special parameters. Inorganic

compounds and special parameters were evaluated separately as described in Section 4.9. All subsequent steps in the logic focus on selecting and prioritizing the regulated organic analytes for future characterization based on the following technical decisions. These decision steps establish the plausibility of the regulated compound's presence in the vapor samples.

A database was compiled to implement this logic, which is referred to as the Air DQO database. The diagrams in Figures 4-1 to 4-3 illustrate the process. Each decision in the process is identified with a "D" and each database query is identified with a "Q." The figure and text reference both decisions and queries as applicable. All comparisons in the database are based on a unique identifier for each compound. Usually, this identifier would be the chemical abstract services number (CAS#). In some cases, a CAS# does not exist and a unique identifier was assigned to the compound to enable comparison of compounds.

The brief explanations below describe the figures and steps in the decision logic process:

Figure 4-1: "Regulatory Input List and Logic to Segregate Regulated Detected and Regulated Non-detected Compounds for Non-radioactive Constituents."

The logic to

- define the Air DQO Input List and
- list compounds that are regulated and have been reported in TWINS vapor database and for Tank C-106 (Sasaki 1999), and will be retained for COPCs.

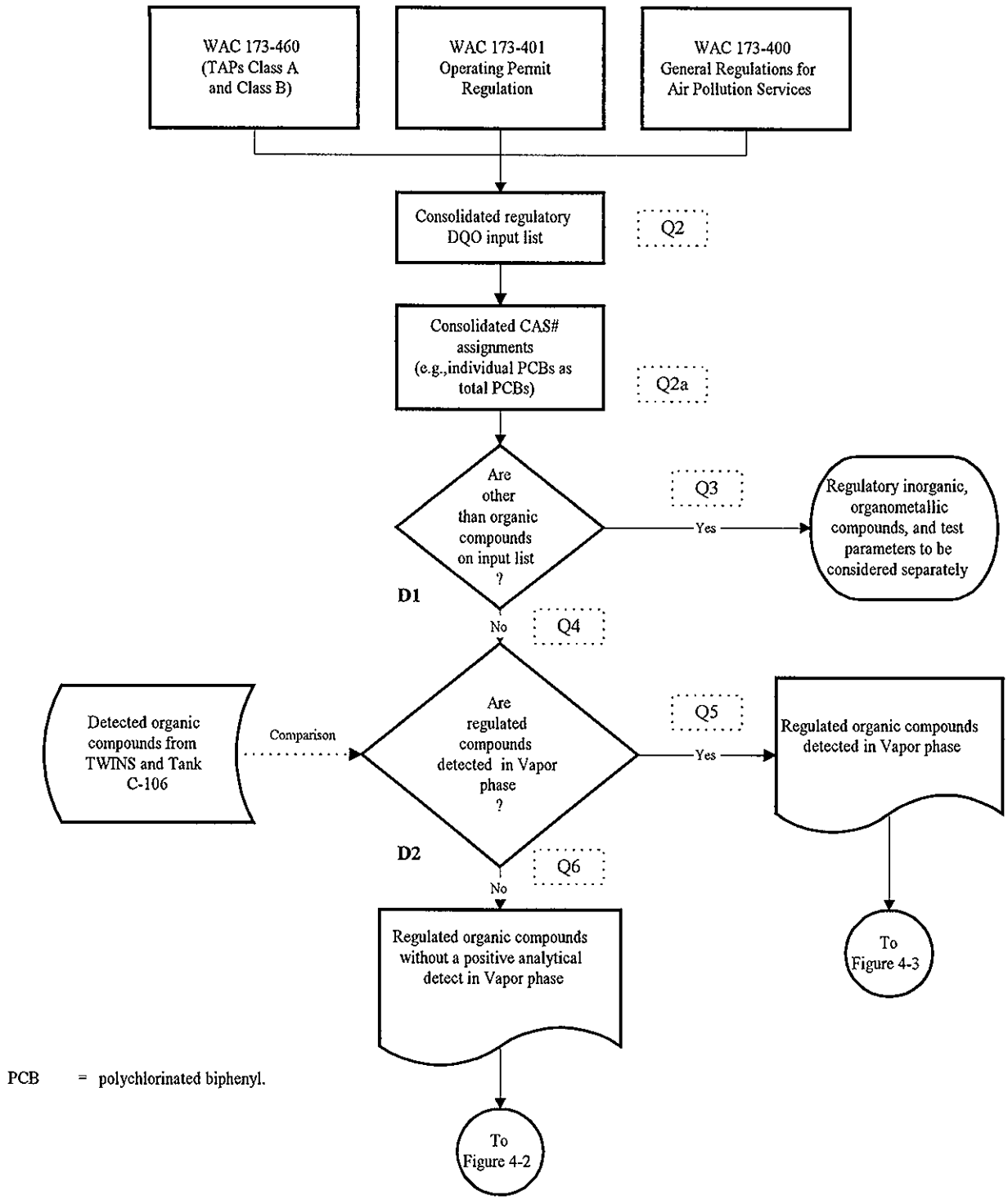
Figure 4-2: "Logic to Assess Non-detected, Regulated Compounds from Industries not Associated with Hanford."

The logic to assess whether the non-detected, regulated compounds were likely to be used at the Hanford Site.

Figure 4-3: "Logic to Assess Non-detected Compounds for Stability, Volatility, and Compilation of List of Constituents of Potential Concern."

The logic to evaluate non-detected, regulated compounds for stability, volatility, and to prepare the list of organic COPCs.

Figure 4-1. Regulatory Input List and Logic to Segregate Regulated Detected and Regulated Non-detected Compounds for Non-radioactive Constituents.



PCB = polychlorinated biphenyl.

Figure 4-2. Logic to Assess Non-detected, Regulated Compounds from Industries not Associated with Hanford.

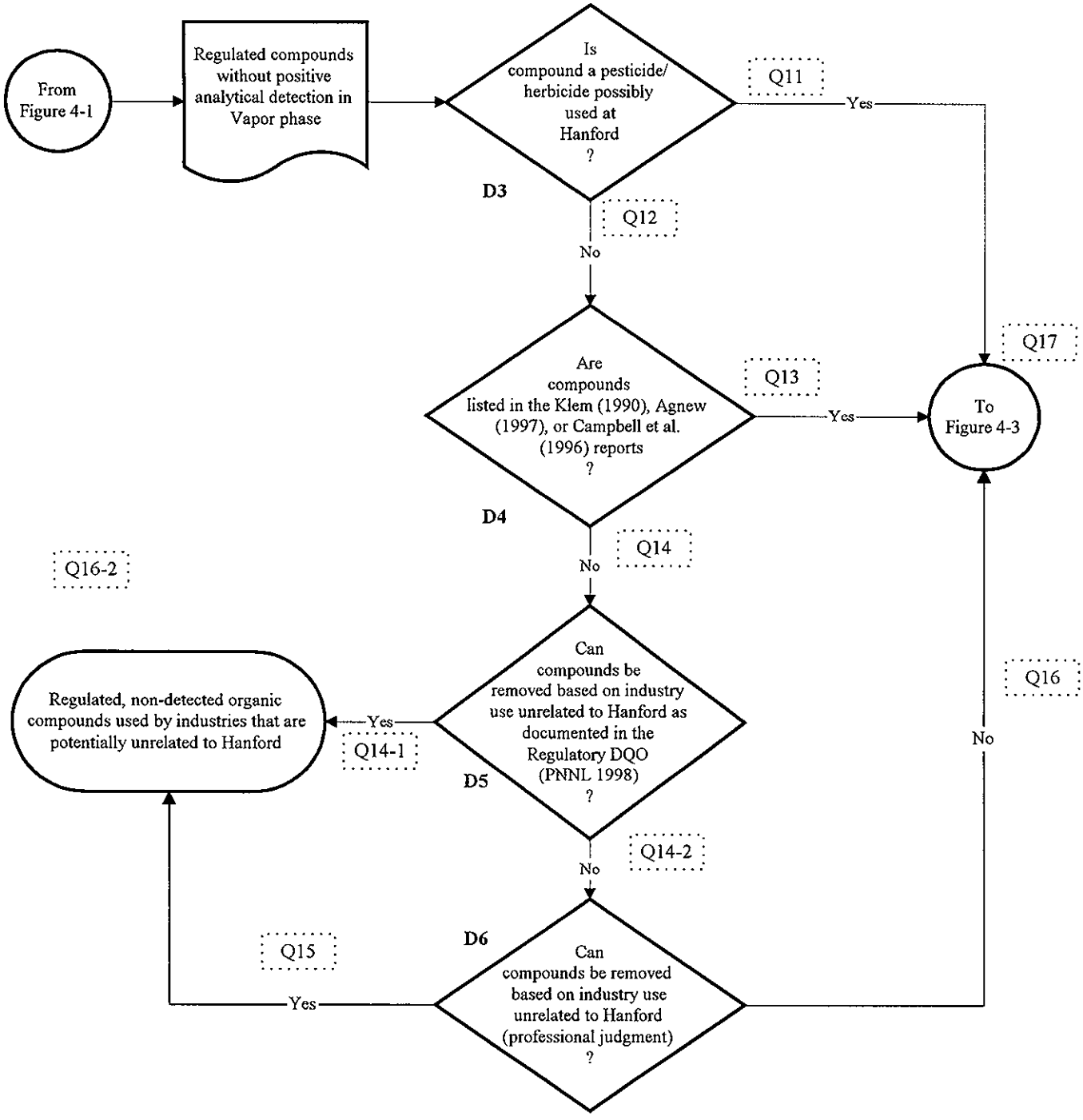
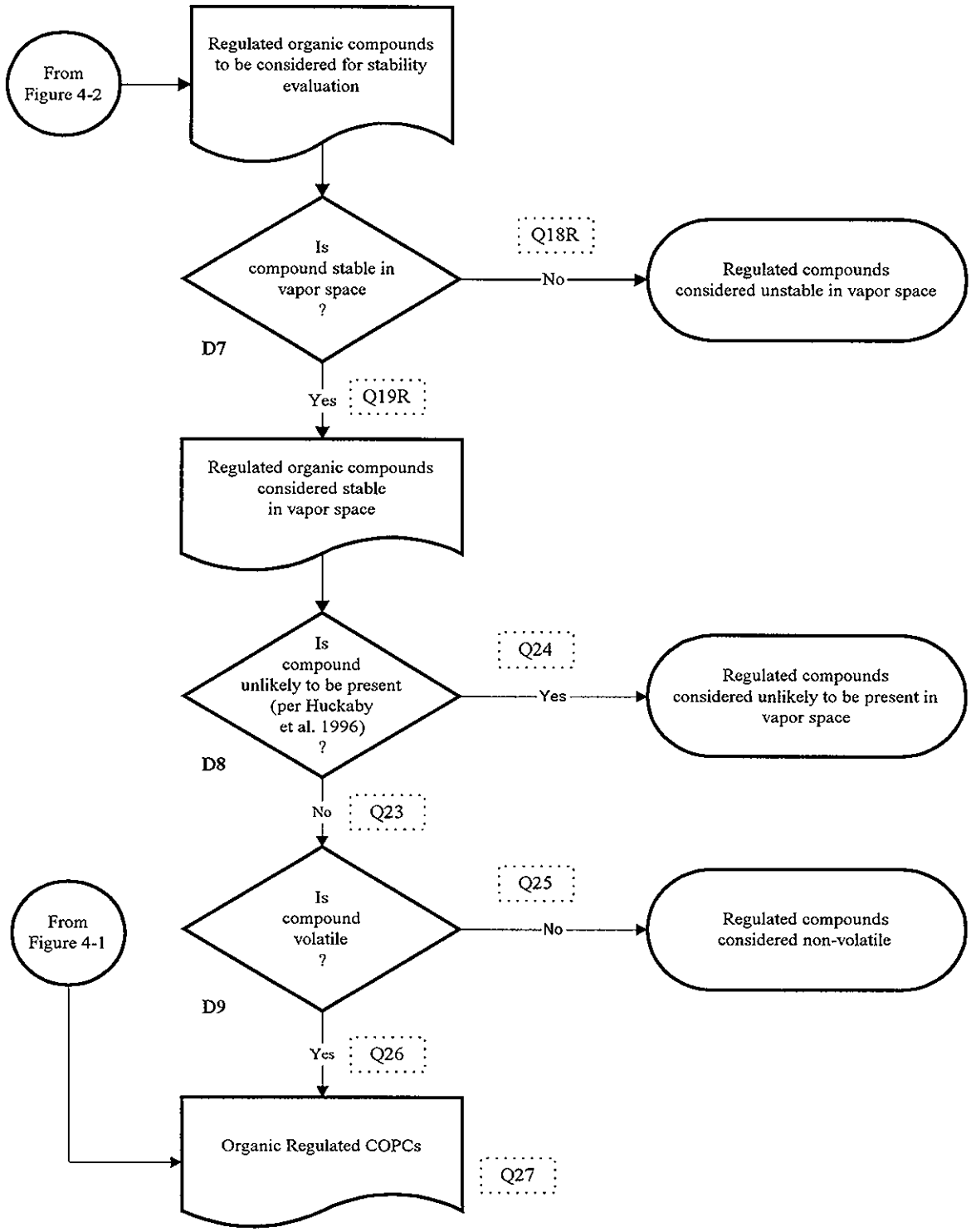


Figure 4-3. Logic to Assess Non-detected Compounds for Stability, Volatility, and Compilation of List of Constituents of Potential Concern.



The regulatory compounds were compared against the following criteria:

- Industry uses not associated with Hanford activities,
- Stability in vapor space, and
- Volatility.

The above criteria are described in detail in Sections 4.6 through 4.8. For each of the criteria, a list of compounds to be excluded from further consideration was created. These tables along with the other documentative tables from the database are presented in Attachment I. To obtain a copy of this attachment, contact Central Files at 376-5440. This DQO provides the appropriate information for all the compounds from the regulatory drivers and the tables categorize the information for the individual drivers.

4.2 REGULATED ORGANIC ANALYTE SELECTION LOGIC

The discussions in the following sections first address the starting list for analytes in this Air DQO, called the regulatory compound input list (Section 4.4). After explaining the starting list, the following group of regulated, non-detected analytes (based on the logic in Figures 4-1 through 4-3) is presented.

4.3 ORGANIC COMPOUNDS DETECTED IN SINGLE-SHELL TANK/DOUBLE-SHELL TANK WASTE

Over 9,000 analytical records were reviewed from the TWINS SST and DST solid and liquid database and the TWINS SST vapor database (databases obtained on October 25, 1997). The information obtained from the TWINS databases, including the number of detects reported in the vapor phase, were used for comparison in the Air DQO database. The analytical data presented in the TWINS databases were assumed to be verified against the analytical records. The TWINS database values were used as presented without any further validation.

In addition, the reported detections in vapor samples during sluicing from Tank C-106 (Sasaki 1999) were added to the previous TWINS data. Adding these compounds results in a conservative list of COPCs with respect to the regulations. However, no "new" regulated organic compounds were found in Tank C-106 that were not previously reported in TWINS.

4.3.1 Air Data Quality Objective Database Refinement

Operations completed to refine the Air DQO database for application to the decision logic are described in the following sections.

4.3.1.1 Treatment of Tentatively Identified Compounds. Compounds reported as tentatively identified compounds (TICs) are identified by comparison of mass spectra from the sample to libraries of spectra. The identification and quantitation are not confirmed by the running of

standards on the instrument used to analyze the sample. Therefore, significant uncertainty is associated with the identification and quantification of TICs. TICs are identified by either a compound name from best match from the library, as a compound class (e.g., aromatic), or are reported as an unknown.

The TICs identified in the TWINS vapor phase database represent the majority of reported data for regulated analytes in tank waste. The vapor phase tentatively identified compound data were retained in the Air DQO database for assessment of "number of detects."

4.3.1.2 Removal of Inorganics and Organometallics, Quality Control Reagents, and Artifacts. The original TWINS data were filtered to exclude inorganic analytes and test parameters, analytical QC reagents (i.e., analytical method surrogates and internal standards), and analytical artifacts (i.e., siloxanes from gas chromatography column degradation). Inorganic and organometallic analytes and test parameters are considered in Section 4.9.

4.3.1.3 Consolidation of Chemical Abstract Service Numbers. TWINS did not uniquely identify the compounds; therefore, cross-references were performed in the TWINS database on chemical names, and a list of synonyms consisting of over 7,500 entries was reviewed. One specific, commonly used chemical name was assigned to each CAS#. The final list of unique compounds considered in this DQO was consolidated. The CAS# is used as the key field for comparison of compounds across the database and with other databases. For example, methylene chloride and dichloromethane were consolidated as dichloromethane with CAS# 75-09-2. Compounds that were listed as mixtures specifying more than one compound were not included in the assessment. For example, xylene (CAS# 1330-20-7) was removed since the individual isomers (para, meta, and ortho) were included as individual compounds.

4.3.1.4 Oregon Graduate Institute Data. The Oregon Graduate Institute (OGI) data were flagged in the TWINS vapor database stating that either no approved QA documentation existed, or that a significant QA deficiency was associated with the reported results. All OGI analytes were confirmed by analyses from other laboratory(ies) and, therefore, the OGI data were retained in the Air DQO database.

4.3.2 Identification of Positive Detects

The remaining data were reviewed for determination of "positive detect" status. A positive response is defined as one or more detects that are not qualified as a reject or reported at or below the analytical detection limit. Duplicate samples with one reported detect were counted as a positive detect. As discussed previously in Section 4.3, the TWINS database values were used without any further validation; any prior reasons for rejecting data were not investigated.

4.3.3 Final List of Detected Organic Single-Shell Tank/ Double-Shell Tank Waste Compounds

The compiled list of organic SST/DST waste, vapor phase compounds assigned as "detects" were compared with the Air DQO Input List (Section 4.5).

4.4 AIR DATA QUALITY OBJECTIVE INPUT LISTS

The drivers were discussed in detail in Section 3.0. Attachment I, Table Att-I-1, provides the combined list for the compounds from WAC 173-460 and WAC 173-401. For 40 CFR 265, Subparts BB and CC, testing is required of the liquid waste; therefore, these parameters were not included in the input list. The radionuclides are addressed in Section 4.9. The combined Air DQO Input List contains 702 compounds (Figure 4-1, Q2).

4.4.1 Consolidation of Chemical Abstract Services Number Assignments

Isomers and congeners[1] were evaluated for potential CAS# consolidation. In the case of the cresols (ortho, meta, para), total cresol also was listed as a compound in the combined regulatory input list. The step of consolidation removed total cresol from the input list and resulted in 701 compounds following Figure 4-1, Q2a.

4.4.2 Organic Air Data Quality Objective Input List

Because this analyte selection logic applies to organics only, all other compounds, such as inorganics, organometallics, and test parameters were excluded and are considered in a separate logic described in Section 4.9 (Figure 4-1, Q3, 290 compounds). Therefore, the organic Air DQO Input List consists of 511 compounds (Figure 4-1, Q4).

4.5 REGULATED COMPOUNDS DETECTED IN VAPOR SAMPLES

The regulated organic compounds from Figure 4-1, Q4 (511 compounds) were reviewed against compounds reported as detects in the TWINS vapor database as well as in the data obtained from Tank C-106 (Sasaki 1999). This comparison resulted in 127 compounds, which were removed at this point and will be added directly to the COPCs in Figure 4-3, Q27.

The non-detected regulated compounds from Figure 4-1, Q6 (384 compounds) were evaluated against existing chemical inventories of the Hanford Site. This evaluation ensured that compounds from existing Hanford inventories would not be removed during the Hanford industry association assessment. Such inventories include:

- Pesticides/Herbicides potentially used at Hanford (PNNL 1998, Attachment II)
- Klem (1990),
- Agnew (1997), and
- Campbell et al. (1996).

[1] A congener is a compound within the same chemical class (e.g., polychlorinated biphenyls, furans or dioxins).

Chlorinated pesticides and herbicides were likely to have been used during early Hanford Site operations. Therefore, the chlorinated pesticides and herbicides were excluded from the industry assessment. This step resulted in 27 compounds (Figure 4-2, Q11) that were moved over to Figure 4-3 for the stability evaluation. The comparison to existing Hanford Site inventories (Klem 1990, Agnew 1997, and Campbell et al. 1996) resulted in 9 compounds (Figure 4-2, Q13). These compounds also were moved over to Figure 4-3 for the stability evaluation.

The non-detected regulated compounds from Figure 4-2, Q14 (348 compounds) were evaluated for potential exclusions and/or uses in industrial applications unrelated to the Hanford Site (Section 4.6).

4.6 USED IN INDUSTRIAL APPLICATIONS NOT ASSOCIATED WITH THE HANFORD SITE

The input lists selected for this Air DQO originated from non-nuclear industries and therefore, include a large number of compounds not associated with the operations at the Hanford Site. Industry uses for each non-detected regulated compound were identified and used in the evaluation of industry applications not associated with the Hanford Site. This evaluation of compounds involved the use of published DQOs, examination of published site inventories, and assignment of predominant industry uses.

4.6.1 Industries Not Associated with the Hanford Site

The regulated non-detected organic compounds were evaluated to assess potential use at the Hanford Site. This evaluation was based on published information on predominant uses from published DQOs from the Hanford Site, a number of commercial databases and best professional judgment. Compounds identified as not associated with the Hanford Site were eliminated from the selection of regulated organic compounds. Compounds previously identified in tank vapor samples were not removed in the Industry evaluation.

The remaining regulatory compounds from D4 (Figure 4-2, Q14, 348 compounds) were reviewed for specific compounds typically used in industries or applications not associated with Hanford activities (Figure 4-2, Q14-1, 157 compounds) as published in the Regulatory DQO (PNNL 1998). The strategy from the Regulatory DQO was agreed to by Ecology and the U.S. Department of Energy, Richland Operations Office. The detailed discussion is published in the Regulatory DQO, which is used as a reference in this Air DQO.

Following the same strategy, the remaining 191 compounds from Figure 4-2, Q14-2, were reviewed for applications not associated with Hanford activities. The following categories were established for industry use, as implemented in the Regulatory DQO (PNNL 1998):

- pesticides,
- military,
- dyestuff,
- pharmaceutical,
- consumer, and
- polymer.

A discussion of each category is presented with examples of the listed compounds. Material Safety Data Sheets, the Merck Index (Merck 1996), and other technical databases were consulted to evaluate the potential uses of each compound. The detailed list of compounds in each category is presented in Attachment I, Table Att-I-8.

- Pesticides. Compounds included in this category and referred to in this logic as "pesticides," include pesticides, fungicides, miticides, insecticides, rodenticides, and herbicides. Available information suggests that pesticides used at the Hanford Site were used primarily within enclosed operating facilities and offices, not the "outdoor" environment. Only compounds whose removal from consideration could be justified were eliminated from additional consideration. Examples of compounds determined not to have been used at Hanford include profenofos (CAS# 41198-08-7) and amitraz (CAS# 33089-61-1).

- Military. This category includes compounds such as explosives and chemical war agents. Examples of compounds include dinitrotoluene (CAS# 25321-14-6) and mustard gas (CAS# 505-60-2).

- Dyestuff. This category includes compounds used in the fabrication of dyes or actual dyes used in all types of materials, food, textiles, etc. Example of these compounds includes Cl solvent yellow 14 (CAS# 842-07-9).

- Pharmaceutical. This category includes chemicals used in making pharmaceuticals. An example of a compound used in pharmaceuticals is tetracycline hydrochloride (CAS# 64-75-5).

- Consumer. This category includes chemicals used in consumer products. An example is saccharin (CAS# 81-07-2), an artificial sweetener.

- Polymer. This category includes chemicals used to make polymers such as neoprene and rubbers. An example is the compound chlorendic acid (CAS# 115-28-6).

4.6.2 Analytes Removed for Industry Uses

The 162 non-detected, regulated compounds that were used in industries unrelated to the Hanford Site were removed from further consideration in this DQO (Figure 4-2, Q16-2). The 186 regulated compounds remaining after D6 (Figure 4-2, Q16) were combined with the analytes

excluded above in D3 and D4 (Figure 4-2, Q17, 222 compounds) and are carried forward to the stability evaluation in Section 4.7.

4.7 STABILITY IN TANK WASTE ENVIRONMENT

The 222 compounds from Figure 4-2, Q17, were regulated constituents expected or likely to be present in the vapor space samples and were evaluated for stability in the vapor headspace environment. Compounds listed in literature as unstable or moisture sensitive were excluded from further consideration. In Figure 4-3, Q18R, 1 compound was excluded for reasons of instability in vapor space.

Huckaby et al. (1996) The data obtained from vapor and condensed phase sampling of three tanks were compared in the report (Huckaby et al. 1996). The report establishes the likelihood of compounds being present or not. Implementing the discussions into a spreadsheet, several categories can be established. For this Air DQO, the compounds with the categories listed in Table 4-1 were removed in Figure 4-3, D8. This process resulted in the removal of 12 compounds from the analyte selection logic.

Table 4-1. Categories from Huckaby et al. (1996).*

Category	Explanation
i2	highly unlikely; particulate
i3	highly unlikely; nonvolatile
i5	highly unlikely; not stable in water or moisture
i8	highly unlikely; unstable

* Huckaby, J.L., J.A. Glissmeyer, J.E. Meacham, and L.A. Stauffer, 1996, *Comparison of Organic Constituents Found in the Condensed and Vapor Phases of Tanks 241-BY-108, 241-BY-110, and 241-C-102*, WHC-EP-0919, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

4.8 VOLATILITY

In Figure 4-3, D9 the question is "is the compound volatile?" If the compound is not volatile, then its presence in the vapor space would not be anticipated. The following questions were asked to establish volatility:

- Can the compound be analyzed by an existing analytical methods, such as SW-846 (EPA 1997), EPA-TO, Special Analytical Support "Vapor" target list, and, therefore, be categorized?

- As per EPA definitions, can the compound be categorized by its vapor pressure (Pvap) as nonvolatile? EPA definitions are: volatile (Pvap. > 0.10 mm Hg), semivolatile (Pvap < 0.1 but > 1E-7 mm Hg), and nonvolatile compounds (Pvap < 1E-7 mm Hg). Vapor pressure information was obtained from databases such as TOMES [2]and NIOSH.

- Can the compound be categorized based on its boiling point? Volatiles generally have boiling points below 200 °C, and include the chlorofluorocarbons. Semivolatiles have boiling points > 200 °C, including organic salts such as hydrochlorides and sulfates. Compounds with high boiling points (> 350 °C) and high molecular weights were grouped as nonvolatiles.

The above evaluation resulted in compounds 27 compounds excluded from this Air DQO (Figure 4-3, Q25) based on this query.

The 182 regulated non-detected stable compounds from Figure 4-3, Q26 were combined with the regulated compounds detected in vapor space from Figure 4-1, Q5 (127 compounds), and resulted in the list of organic COPCs (Appendix C, Table C-1, 309 compounds).

4.9 INORGANIC AND ORGANOMETALLIC COMPOUNDS AND TEST PARAMETERS SELECTION RATIONALE

There were 190 regulated parameters and inorganic and organometallic constituents identified in the Air DQO Input List, which were evaluated separately from the regulated organic analytes (Figure 4-1, D1). The distribution between inorganic and organometallic constituents, chemical groups and mixtures, and chemical properties is shown in Table 4-2.

Table 4-2. Summary of Regulated Compounds to be Considered.

Constituent/Parameter	Number
Regulated inorganic constituents	160
Regulated organometallic constituents	14
Regulated chemical groups and mixtures	15
Regulated chemical properties	1
Total constituents/parameters to be considered in separate logic	190

Organic compounds retain their form in different matrices. Inorganic compounds can be combined in a multitude of chemical structures, and each chemical structure has its own specific CAS#. However, when an analytical method is performed to analyze for an inorganic

[2] TOMES Database available on CD ROM at Washington State University Tri-Cities, Consolidated Information Center, Richland, Washington.

compound, this method will look for the ionic form. Therefore, to enable the comparison of inorganic compounds in regulatory requirements and tank inventories, the inorganic compounds are identified as their associated ions and metals. This step resulted in a unique list of 62 compounds (Appendix C, Table C-2).

The method of disintegrating the organometallic and inorganic compounds into their ionic form is an automated database function. A compound such as calcium hydroxide is a TAP, but in its ionic form of calcium and hydroxide it doesn't appear to be a toxic concern. This method of ionic disintegration is a tool, and should be followed up with a professional evaluation on a case-by-case basis.

The rationale for deriving the final list for analysis is addressed in terms of analytes retained and analytes excluded for analysis, and those for which alternatives to direct analysis are provided. The specific analytes and justifications for these actions are provided in the following sections.

4.9.1 Special Parameters

Several special parameters should be considered for analysis. For the screening of radionuclides on filter material, test methods for total alpha and total beta can be performed. For the regulatory drivers of 40 CFR 265, Subparts BB and CC, the actual liquid waste needs sampling if the organic content exceeds requirements. The testing of the liquid phase includes analysis for TOC and the measurement of pH. Table 4-3 summarizes the special parameters for COPCs.

Table 4-3. Special Parameters for COPCs.

CAS#	Constituent	Matrix
TOTALA	Total Alpha (AT)	Filters
TOTALB	Total Beta (TB)	Filters
pH	pH	Liquid waste
TOC	Total Organic Carbon (TOC)	Liquid waste

4.9.2 Radionuclides

As discussed in Section 3.2, a list of radionuclides should be included in every COPC list for analysis of TRWS waste samples. These radionuclides are shown in Table 4-4.

Table 4-4. Radionuclides for COPCs.

CAS#	Constituent
10045-97-3	Cesium-137
86954-36-1	Americium-241
I126	Plutonium-239
R5	Plutonium-240
10098-97-2	Strontium-90

4.9.3 Regulated Analytes to be Considered for Exclusion

The regulatory drivers were prepared for different types of waste and waste generators. Several inorganic compounds exist on the regulatory lists, which should be considered for exclusion from the list of COPCs, because their presence in the vapor sample is highly unlikely. Table 4-5 summarizes the compounds under question.

- Regulated Analytes not Included in Site Inventory, Seldom Used in Industry and not Retained for Analysis. The following regulated analytes were not listed in the Klem (1990), Agnew (1997), and Campbell et al. (1996) inventories, are seldom used in nuclear industry, and should be considered for exclusion from the list of COPCs: germanium, hafnium, osmium, indium, and tellurium.

- Carbon. Carbon is listed on the regulatory starting lists (e.g.,TAPs) as carbon graphite, dust, or inorganic compounds (e.g., COS, COF_2, CBr_4). It is unlikely that carbon in the form of graphite or dust is in the tank waste and extremely unlikely to find it in the vapor sample. Inorganic carbon should be considered for exclusion. The anions (e.g., S^{2-}, F^-, Br^-) are being analyzed.

Table 4-5. Inorganic Compounds Under Consideration for Exclusion from List of COPCs.

CAS#	Constituent
7440-56-4	Germanium
7440-58-6	Hafnium
7440-04-2	Osmium
7440-74-6	Indium
13494-80-9	Tellurium
7440-70-2	Carbon

5.0 BOUNDARIES

The scope of this document covers all RPP facilities that release or have the potential to release hazardous or radioactive air pollutants to the ambient atmosphere. These include DSTs, DCRTs, SSTs, IMUSTs, and tank farms maintenance and paint shops. The following paragraphs discuss each of the facilities.

5.1 DOUBLE-SHELL TANKS, DOUBLE-CONTAINED RECEIVING TANKS, SINGLE-SHELL TANKS, AND INACTIVE, MISCELLANEOUS UNDERGROUND STORAGE TANKS

There are 47 tanks (28 DSTs and 19 SSTs) actively ventilated by 8 exhausters, 2 backup exhausters, and 7 tank (or tank farm) annulus exhausters. There are 130 passively vented tanks. Waste stored in the DST system includes waste from the Plutonium-Uranium Extraction (PUREX) Plant, Z Plant (Plutonium Finishing Plant), B Plant, T Plant, 222-S Laboratory, 100 Areas, 300 Areas, 400 Areas, and SSTs. The DSTs use separate ventilation systems for the primary tank and annulus ventilation. The primary tank ventilation system provides a negative pressure in the tanks to prevent the escape of untreated hazardous and/or radioactive particulates to the atmosphere. DST headspaces are typically saturated or nearly saturated with water vapor and contain trace levels of organics. Substantial levels of ammonia (NH_3) have been measured in some tanks.

The DCRTs function as receiver tanks, lift stations, and vent stations for SST or DST waste. The DCRTs have tank ventilation systems. The exhausted air passes through a heater, prefilter, and HEPA filters; then it is monitored for radiation. The DSTs and DCRTs are classified as emission units according to the definition of emissions unit in WAC 173-401, Section 200(11). Sections 6.0 and 8.0 of this document provide the strategy for sampling efforts.

The SSTs that are passively vented may be actively ventilated in the future. In order to perform best available control technology and toxic best available control technology evaluations, it will be necessary to assess radionuclide and nonradionuclide concentrations. The SSTs are required to use reasonably available control technology according to WAC 173-400, Section 040, "General Standards for Maximum Emissions" and as low as reasonably achievable control technology (ALARCT) according to WAC 246-247.

The 50 IMUSTs identified to date are located in the 200 East and 200 West Areas of the Hanford Site. These tanks may contain chemical and radiological hazardous materials and represent a potential hazard. The condition of these tanks and the volume of waste contained in each lack a high degree of accuracy and certainty (Farley 1995). The IMUSTs containing waste should undergo sampling efforts. Sampling requirements for IMUSTs will be addressed in this document.

5.2 MAINTENANCE AND PAINT SHOPS

There are nine maintenance and paint shops in RPP. Maintenance and paint shops can be classified as categorically exempt insignificant emission units according to WAC 173-401, Section 532(33). Quantification of emissions from these units is not required and the activities occurring in these units are exempt from operating regulations (WAC 173-401).

6.0 DECISION RULES

Decision rules for needed analyses were formed by applying the regulatory drivers discussed in Section 3.0 (logic charts) to the equipment subject to these requirements (described in Section 5.0). The rules are based on the combination of best management practice and specific regulatory requirements. The rules are based on the assumption that process knowledge should be confirmed by some representative level of actual analytical results. Decision rules are presented for two purposes:

- Establishing when to collect samples and
- Establishing criteria to evaluate data.

6.1 ESTABLISHING WHEN TO COLLECT SAMPLES

If there are limited existing emission data or if the existing data do not represent current operations for some emission sources, additional data are required. Once process knowledge has been confirmed by analytical information, continuing analyses can be reduced and/or eliminated. Decision rules for these situations cannot be addressed because the reliability of process knowledge has not been verified.

In applying the decision rules, the following considerations should be used.

1. The stated analyses should be performed within the next 5 years. If a source is modified, analyses will be conducted before permit application.

2. If there are already analytical data on a particular source, and new/additional analyses indicated by this document are not thought to be needed, obtain concurrence from the Environmental Cleanup and Compliance Project that additional data are not required.

3. In most cases, the analyses required by this document will be used to confirm process knowledge and to document actual versus worst-case emission rates.

Currently available analytical data should be examined to determine whether changes in operations or other factors might have triggered a need to verify emissions. Items which could trigger changes include the following:

- new waste types being processed or stored,
- intrusive operations taking place in the waste system, and
- changes in storage or operating conditions.

6.2 EVALUATION CRITERIA FOR DATA

Decision rules provide an explanation of how the decisions will be made once data are obtained. The rules apply to both new and existing data. In order to establish the decision rules, the statistical parameter (mean, highest value, etc.) must be presented along with the list of COPC to which it applies. Tables 1-1, 1-2 and 1-3 present the drivers for the application of the regulations to a specific boundary or tank type. Table 6-1 presents applicable statistical parameters along with the relevant COPCs and action levels. The action levels vary by regulation and compound. Therefore, the COPCs are presented in detail in Appendix E, Table E-1, with the associated action levels per the regulation. Note that regulations found in 40 CFR 265 Subparts BB and CC specify sampling of the waste, not the headspace above the waste. All other regulations apply to the headspace above the waste.

In order to generate decision rules for a particular tank, follow the process below:

1. Assess applicability of regulations (Tables 1-1, 1-2, and 1-3).

2. Assess whether process knowledge or added sampling is needed, using Sections 3.0 and 6.1.

3. Use Tables 6-1, 6-2, and 6-3 to write decision rules for a specific tank.

Because it is impossible to write all the combinations of regulations with each of the types of tanks, Tables 1-1, 1-2, and 1-3 and Tables 6-1, 6-2, and 6-3 allow one to create a decision rule. Examples of the use of these tables to create decision rules are:

- Example 1: For a given IMUST, the headspace was analyzed for the TAPs in Appendix E, Table E-1, and the 24-hr weighted average from three samples was compared to the TAPs limits in Table E-1. If the 24-hr result is above the action limit in Table E-1, appropriate emission controls must be placed on the IMUST tank.

- Example 2: An IMUST is suspected of containing organic waste. If the average of four liquid samples from the surface of the waste contains greater than 500 ppmw organics, then tank must be managed per 40 CFR 265.1085.

Table 6-1. Regulatory Drivers, Statistical Parameters, and COPCs/Action Levels.

Citation for Regulatory Driver	Title of Regulatory Driver	Statistical Parameter	COPCs and Associated Action Levels
40 CFR 265, Subpart BB	Air Emission Standards for Equipment Leaks	Highest value obtained in actual waste or process knowledge	TOC <10 % by weight
40 CFR 265, Subpart CC	Air Emission Standards for Tanks, Surface Impoundments and Containers	Average of 4 measurements of waste or process knowledge	VOC <500 ppmw
WAC 173-400	General Regulations for Air Pollution Sources	Thresholds above which the law applies are based on either tons/year or are based on WAC 173-460, TAPs levels as noted below.	See Table 3-2 for details.
WAC 173-401	Operating Permit Regulations	No discussion is presented in the regulations requiring averaging. Insignificant emission units and associated limits are in tons/year.	See Appendix C, Table C-1 for details.
WAC 173-460	Controls for New Sources of Toxic Air Pollutants (TAPs)	Small quantity emission (SQE) rates for Class A TAPS estimate total pounds per year. For Class B SQE estimate over a 24-hr period and calculate in pounds/yr or pounds/hr. Depending on the compound, annual or 24-hr averages can be calculated as an alternative for SQE rates for Class A and B TAPs.	See Appendix C, Table C-1 for details.
WAC 246-247, 40 CFR 61, Subpart H	Radiation Protection – Air Emissions	Review WAC 173-040, -050 and -060	Table 3-4 or other primary dose drivers specific to tank contents.

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7.0 DECISION ERROR LIMITS

The purpose of this step in the DQO process is to assess the consequences of making an incorrect decision as a result of an error, to estimate the allowable error rate, and to use this information to calculate the number of samples (EPA 1994). The parameters listed below are considered in the error assessment and used to calculate the number of samples.

- level of false positives, Type I error with probability α,
- level of false negatives, Type II error with probability β,
- action level, and
- variance (standard deviation or relative standard deviation).

Normally, the result of the decision error assessment is a recommendation as to the number of samples and the sampling design. Typically, the Type I and II errors, action levels, and variance are known or estimated and the number of samples calculated based on these parameters.

In order to evaluate the decision error one must state a hypothesis. The EPA and other statistical guidance recommend that one state a conservative hypothesis (e.g., worst case). The hypothesis is that the waste concentration exceeds the action limits.

The two decision errors that can be made are:

- mistakenly concluding that the waste is below the action limit (also called Type I error)
- mistakenly concluding that the waste is above the action limit (also called power or Type II error).

For volatile organic and total organic analysis of actual waste which is required for actual waste analysis, SW-846 Chapter 9 (EPA 1997) recommends that one uses an upper 90% confidence limit based on a one-sided distribution. This translates to a Type I error of 10%. The upper 90% confidence limit is compared to the action limit per SW-846 guidance. SW-846 does not recommend an error rate for mistakenly concluding that the waste is above the action limit. The *Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)* document (NRC 1997), which is the latest guidance from the U.S. Nuclear Regulatory Commission, EPA, and DOE, does not specify an error rate for mistakenly concluding that the waste is above the action limit. One can evaluate the trade-offs between the cost versus the number of samples required to evaluate the latter decision error. It is recommended but not required that a rate of 20% be used. This is consistent with the rates being used for waste evaluation by other contractors on the site and consistent with sampling designs being approved by EPA and Ecology. Table 7-1 shows the recommended decision errors to be evaluated if multiple samples are collected from the waste.

Since no requirement for levels of decision error is presented in the air analysis methods, the SW-846 (EPA 1997) decision error levels are recommended as targets for headspace analysis for organics, anions, and ammonia.
For radionuclides, the result of evaluation of the air regulations typically result in monitoring the record samplers and CAMs as opposed to collection of waste samples. Since only one record

sampler/CAM is present at a given time, and a variance cannot be calculated from one sample, no decision error evaluation is recommended for radionuclide air samples.

EPA DQO guidance recommends that one also specify the gray region or the minimum detectable difference (EPA 1994). In this case, the upper bound of the gray region is the action limit. The lower bound is based on the typical percent difference between replicates and is specified for organics, anions, and ammonia in Table 7-1.

Table 7-1. Decision Errors.

Media	COPC Class	Target Type I Error	Target Type II Error	Upper Bound of Gray Region	Lower Bound of Gray Region
Headspace	Volatile organics (TOC), ammonia and anions	10%	20%	Action limit	50%
	Radionuclides	NA	NA	NA	NA
Waste surface	Volatile organics (TOC)	10%	20%	Action limit	50%

NA = not applicable.
TOC = total organic carbon determined from volatile organic analysis.

8.0 OPTIMIZATION GUIDELINES

This section describes the number of samples required, the sampling and analysis methods based on general waste stream knowledge, QC, and reporting criteria. The sampling and analysis design may be further optimized using the decision error evaluation from Section 7.0. Optimization (e.g., alterations in the number and frequency of sample collection) may be implemented in the sampling and analysis plan as long as RPP Environmental concurs with the optimization. Further optimization of sampling can be performed once the analytical data are available and are validated against emission estimates and error rates in Section 7.0. Power curves may be used after data is collected per Section 7.0.

Whenever "quantify" is used, both chemical composition and flowrate are required, otherwise, only a concentration measurement is required. Section 6.2 discusses how decision rules are derived under the different applicable drivers and types of waste.

8.1 MAJOR STACKS

These stacks (see Appendix B) are determined to have a potential offsite impact greater than 0.1 mrem/yr EDE. Radionuclide emissions from all stacks should be quantified. Quantification must include all compounds listed in Table 4-4 and speciation of all radionuclides which comprise 10% or more of the potential offsite EDE (WAC 246-247, Section 110(8) and 40 CFR 61, Part 93). A continuous monitoring system meeting regulatory requirements must also be maintained on these stacks.

8.2 MINOR STACKS CONNECTED TO TANKS OR OTHER PROCESS EQUIPMENT

These stacks (see Appendix B) are determined to have a potential to emit less than 0.1 mrem/yr EDE. Radionuclide emissions from all stacks should be quantified. Quantification must include all constituents listed in Table 4-4, but additional speciation is not required. Periodic confirmatory measurements are required. Record samplers are used to fulfill the periodic sampling requirement. The results of Record Sampling are placed in annual reports titled "Radionuclide Air Emissions Report for the Hanford Site Calendar Year 19XX." The report for 1998 was issued by Diediker and Rhoads (1999).

8.3 MINOR STACKS CONNECTED TO BUILDING VENTILATION SYSTEMS

These units are miscellaneous stacks associated with venting buildings and should have minimal emissions. See Appendix C, Table C-1 for a listing of minor stacks. Analysis of radionuclides is not necessary if the dispersible source term in the building is very low, however, minor stacks require periodic confirmatory measurement. Analysis for the TAPs and other analytes is not required if calculations show that the levels are below those listed in the Appendix E. Periodic confirmatory measurements are required, but this does not have to be continuous monitoring as required for major stacks. If sampling is required, collect one sample four times per year within the next three years for permitting or every time waste is disturbed or new waste is added to facility.

8.4 SINGLE-SHELL AND DOUBLE-SHELL TANKS

SSTs no longer receive new waste, but they are being used to store waste until the waste is retrieved. DSTs are used to store waste for extended periods and may continue to receive new shipments of waste. When a vapor sample is taken, analysis must include all chemicals listed in Appendix E. If process data are insufficient (per Sections 3.0 and 6.0), samples of the waste must be collected per Section 8.8 and vapor samples must be collected per Section 8.9.

For tanks that do not have active ventilation, one sample will be collected from the headspace of the tank. For tanks that are actively vented, a sample will be collected from the exit of the exhaust system. Information on sampling tank headspace can be found in the SAP for Tank C-106 (Sasaki 1999).

8.5 PAINT, METAL, AND MAINTENANCE SHOPS

These units are buildings used for support purposes. Emissions are assumed to be mainly from chemical use, such as commercially purchased solvents. No analyses are needed as long as material safety data sheets specify the quantity of all EPCRA Section 313 constituents present in materials and chemical use records are kept. If the material safety data sheets do not have information on EPCRA constituents, analyze solvents for the chemicals listed in Appendix B having an asterisk in the column labeled EPCRA Section 313 if it is thought that these chemicals may be present.

8.6 MISCELLANEOUS TANKS (INCLUDING DOUBLE-CONTAINED RECEIVING, FLUSH, SETTLING, DECONTAMINATION AND CATCH TANKS, IMUSTS)

These units are small tanks used during waste shipments that are not used to store waste (other than a tank heel) for extended periods of time. Waste passes through these tanks on its way to the long-term storage tank. Emissions from these sources are thought to be variable; the greatest emissions occur during waste shipments or treatment. If current emission data are not available

from the exhausters listed in Appendix C associated with all SSTs, DSTs, DCRTs, or IMUSTs in or through which waste is stored or transferred, headspace should be sampled for the radionuclides/chemicals listed in Table 4-4 and Appendix E. For IMUSTs, one must assess whether sampling of the headspace is required per 40 CFR 265 Subparts BB and CC. In order to make the assessment, data or process knowledge from the actual waste is needed. If data or process knowledge are not available to assess whether organics exceed criteria listed in Table 1-1, surface samples of the waste are required. At least four surface samples should be collected. Four samples are specified by 40 CFR Subpart CC, 265.1084(3)(ii)(A). The number may be decreased to two if compliance with this regulation is not applicable per Table 1-1 of this document.

8.7 ROTARY MODE CORE SAMPLING EXHAUSTER

The RMCS permits (Section 7.0 and Appendix B of DOE-RL [1998a] and Section 9.0 of DOE-RL [1997]) describe the process for determining whether sampling and analysis is required and what should be analyzed. The sampling and analysis should be performed per Section 8.8.

8.8 SAMPLING AND ANALYSIS OF SLUDGE/SUPERNATE WASTE

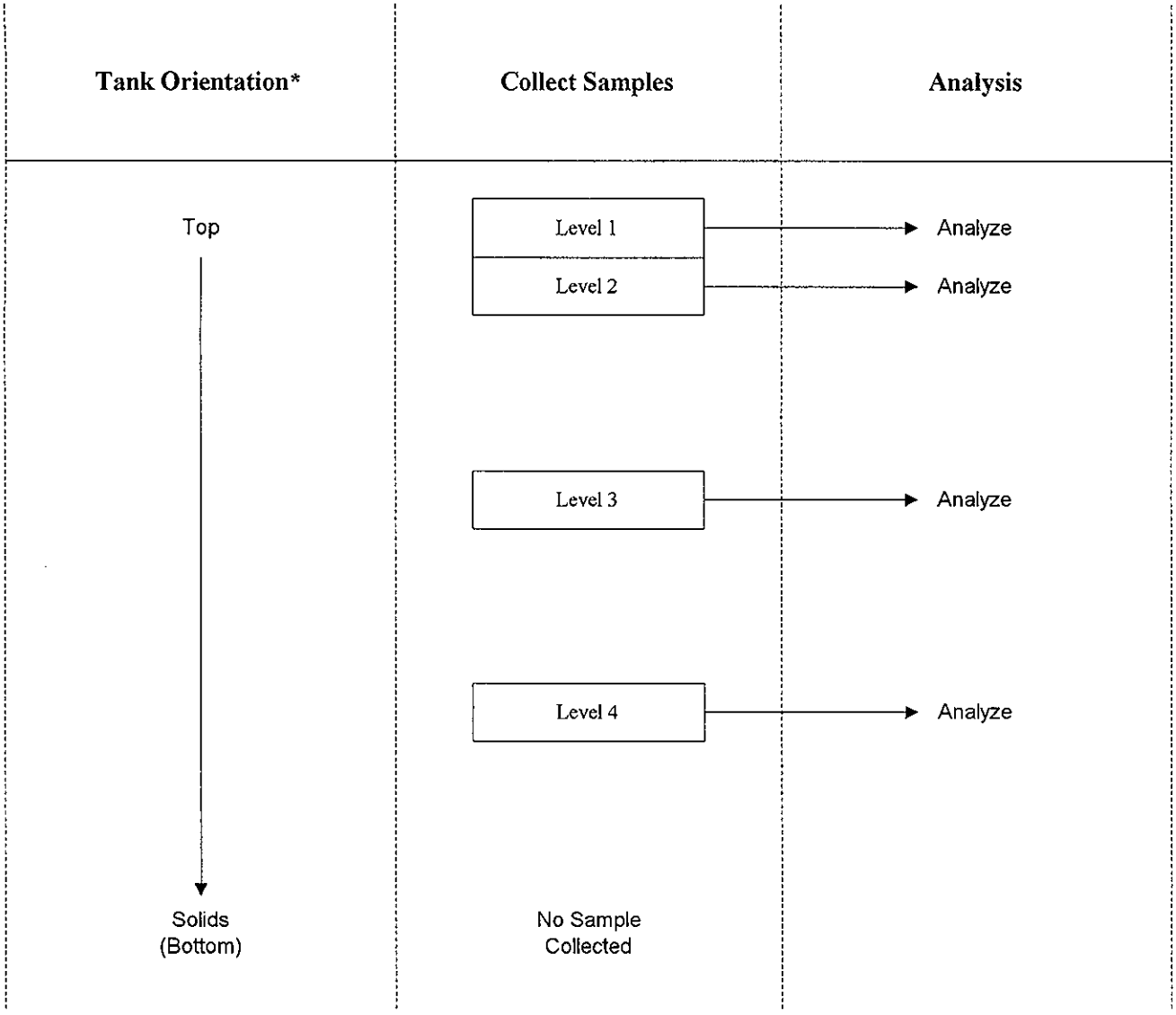
8.8.1 Sample Collection

The regulations found in 40 CFR 265, Subparts BB and CC, require sampling of the actual waste. 40 CFR 265 Subpart BB does not specify a required minimum number of samples to collect, but requires that samples shall be representative of the highest total organic content of hazardous waste (40 CFR 265.1063(g)). This could include a sample of the solid material, if it is anticipated to contain the highest total organic content. For most tanks, the top layer would be suspect of containing most of the organics. 40 CFR 265 Subpart CC requires the collection of a minimum of four samples which shall be representative of the complete range of waste stream composition (40 CFR 265.1084(a)(3)(ii)(B)). This means that collection of only surface samples would not represent the tank waste. Tanks containing both liquid/supernate and sludge/solids are included in the scope.

A generic grab and core sampling scheme is presented in Figure 8-1. For any tank with known strata, the sample depth should be adjusted to include strata that are likely to contain organics. For supernate, sample collection grab samples are collected. The equipment used for grab sampling is an open device attached to a string. The device is about a foot long. If 40 CFR 265 Subpart BB applies, the following is the recommended strategy:

- If the liquid level (LL) of waste is <101 cm (40 in.), one grab sample will be obtained from the surface. If 40 CFR 265 Subpart CC applies, the total minimum number of samples is four. It is recommended that two samples be collected from the surface. While this biases the average, the surface does contribute the most to the organic vapor composition.

Figure 8-1. Sampling Strategy for Quantification of Organics in Waste for 40 CFR 265 Subparts BB and CC.



*See Section 8.8.1

- If 101 cm (40 in.)<LL<250 cm (100 in.), obtain one grab sample that is representative of the waste.
- If LL>250 cm (100 in.), obtain grab samples with at least one grab sample per 250 cm (100 in.).

For sludge/solid samples, collect one core and assure that at least one segment is collected for each waste level for a minimum of three levels and a maximum of five levels.

8.8.2 Sample Analysis

In order to meet 40 CFR 265 Subparts BB and CC, one must either use process data or sample the waste to assess the organic content per Table 1-1 and Section 3.1. This section discusses sampling of the waste to allow assessment against this requirement. 40 CFR 265 Subpart BB, 265.1063(d) list appropriate methods for waste analysis. Any of the methods listed in the regulation may be used. The regulation allows use of SW-846 (EPA 1997) Method 8270 (GC/MS) and TOC, Method 9060, which is written for only aqueous waste. Should RPP choose to use thermal gravimetric analysis or alter Method 9060 for solid radioactive waste, a method modification must be approved.

40 CFR 265 Subpart CC, 265.1084(a) lists the allowed waste analysis procedures. Subpart CC lists methods 8260 and 8270. Based on this information, the latest version of 8260B is recommended to comply with Subparts BB and for compliance with Subpart CC methods 8260B and 8270C are recommended. The methods are listed in Table 8-1 with specified QC. Alternate methods that meet the regulatory criteria may be used if RPP Environmental Engineering approves the change. EPA approval is also needed for thermal gravimetric analysis since this analysis is for RCRA compliance.

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8.9 VAPOR AND PARTICULATE SAMPLING AND ANALYSIS

8.9.1 Nonradionuclide Sampling

Samples should be collected from two distinct headspace volumes per tank and at different heights to account for spatial variability. The preferred methods of sample collection involve sorbent traps with packing for polar volatiles, polar semivolatiles, and nonpolar compounds, and SUMMA[1] canisters for compounds that are not captured efficiently in traps. SUMMA canister, sorbent train and particulate filter samples will be collected per procedure LO-080-400, "Vapor Sampling Using Non-Electrical Vapor Sampling (NEVS) System."

8.9.1.1 Preparation of Sampling Containers.

SUMMA canister samples, triple sorbent trap (TST) samples, sorbent tube train (STT) samples, and polyurethane foam (PUF) samples will be collected and sent to the laboratory for analysis; field and trip blanks will accompany the samples. Particulate filter samples will be collected for radiation screening of the samples. The laboratory shall prepare the SUMMA canisters, TSTs, STTs, and PUFs for sample collection. The laboratory shall also prepare the particulate filter assemblies for use at the sampling location; each particulate filter assembly shall contain two particulate filters mounted in series.

An inert tube is lowered into the tank headspace to assure representative sampling. This method provides the ability to collect samples quickly and without a special sampling probe. The disadvantages of this method include a limited ability to sample some volatile organic vapors under certain circumstances (for example, acetone in a high-humidity tank) and the breaking of the tank containment with each sampling event.

8.9.1.2 Vapor Sampling Activities. Vapor samples will be collected through a Teflon[2] or inert tubing such as stainless steel sampling tube which extends down to two locations one near the surface and a second closer to the top of the tank. Sampling equipment will be connected to the sample tube via a Swage Lok[3] fitting and checked for leaks both before and after sample collection.

Cleanliness of the NEVS system shall be checked and verified. Two ambient air SUMMA samples shall be taken as field and system blanks. A field blank will be taken directly into a SUMMA canister, upwind of the tank sampling riser. A system blank will be collected by sampling ambient air through the entire length of the NEVS sample line.

The Characterization Project Office (CPO) sampling activities will adhere to the methodology accepted for air samples. Methods such as those used for the Tank C-106 (Sasaki 1999) sluicing tests are acceptable.

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[1] SUMMA is a trademark of Molectrics, Inc., Cleveland, Ohio.

[2] Teflon is a registered trademark of E. I. DuPont De Nemours and Company.

[3] Swage Lok is a registered trademark of the Swage Lok Company, Solon, Ohio.

Tubing used in the collection of vapor samples must be stainless steel, Teflon, or Teflon-coated and the length of the tubing used should be minimized. No C-flex or tygon tubing should be used upstream of the sample containers.

The samples shall include the following QC samples: one TST, STT, and PUF ambient air field blank, and one TST, STT, and PUF trip blank. The trip and field blanks are to accompany the vapor samples to the laboratory.

Records shall include the following information for each sample collected: sample number, start and stop times for the collection of each sample, the VOC reading at the start of the collection of each sample, sample volumes, and any anomalous sampling conditions.

Particulate filter samples shall undergo radiation screening analysis. The remaining samples shall be stored until radiation screening is completed and the samples can be released for analysis. Upon completion of the radiation screening and release of the samples, the samples shall be transferred to the laboratory for analysis.

Without previous data it is difficult to specify the sample volume and duration. These numbers affect the detection limits that result from sampling. Table 8-2 lists the typical volumes and durations for initial sampling. The duration and volume should be adjusted based on any previous data from either the waste or previous headspace samples.

Table 8-2. Sample Volume and Duration.

Sample/Activity	Sample Volume	Sample duration or Flow Rate[1]
Samples		
Collect particulate filter samples	1 L	$\leq$ 500 mL/min
Collect SUMMA canister	200 mL	2 min
Collect TST	200 mL	2 min
Collect STT	6 L	$\leq$ 500 mL/min
Collect PUF trap	25 L	$\leq$ 5 L/min
Blanks		
Store TST Trip Blank	--	--
Store STT Trip Blank	--	--
Store PUF Trip Blank	--	--
Open, close, and store TST Field Blank	--	--
Open, close, and store STT Field Blank	--	--
Open, close, and store PUF Field Blank	--	--

[1]The CPO may adjust sample durations and flow rates as necessary to collect the samples.

8.9.2 Radionuclide Sampling

Test methods for measuring radionuclide air emissions from stationary sources are outlined in 40 CFR 61, Appendix B, Method 114. This method provides requirements for the following: stack monitoring and sample collection methods appropriate for radionuclides, radiochemical methods which are used in determining the amounts of radionuclides collected by the stack sampling, and QA methods which are conducted in conjunction with these measurements. All references to other materials described in Method 114 are adopted for incorporation into this section.

8.9.3 Radiation Screening

Surveys using particulate filter samples will be used during the process test to allow the samples to obtain a radiological release and ensure that the samples meet the laboratory acceptance criteria. Particulate filter samples will be collected and sent to the laboratory for analysis of both the upstream and downstream particulate filters in each particulate filter assembly. Analytical procedures are specified in Section 8.9.4. If the specified limits are exceeded, the survey samples will be recounted every few days until the activity drops below the limits, allowing release of the samples. The results from the radiation screening shall be submitted to the

laboratory and the Process Engineering and RPP Environmental Engineering point-of-contact for vapor sampling for evaluation.

8.9.4 Laboratory Analysis Requirements

The responsibilities of the analytical laboratories are given in this section. Additional QC and deliverable requirements are given in Section 8.10.

Vapor samples shall be analyzed by the laboratory for compounds listed in Appendix C. STTs shall be analyzed for ammonia and oxides of nitrogen (nitric oxide and nitrogen dioxide). SUMMA canisters shall be analyzed for total non-methane hydrocarbons, hydrogen, nitrous oxide, methane, carbon monoxide, carbon dioxide, and selected organic analytes. TSTs shall be analyzed for selected organic analytes. PUF samples shall be analyzed for tributyl phosphate (TBP) and dibutyl phosphate (DBP).

Required analytes for organics are those listed in Appendix C, Table C-1. Radionuclide COPCs are listed in Table 4-4. Quantitation limit goals for the Class A and B TAPs in these tables are documented in Tables C-1 and C-2. The organic compounds will be examined and reported as TICs. A determination is to be made for all other peaks that are at least 10% of the nearest internal standard. If possible, peaks smaller than 10% of the nearest internal standard should also be identified. All major constituents in the sample should be identified, and the laboratory should attempt to obtain positive identification by analyzing with the appropriate standards.

It is expected that, at a minimum, the laboratory will be directed to analyze all trip blanks, field blanks, and at least two samples from each tank or system being monitored. Before the receipt of the samples at the laboratory, the Process Engineering point-of-contact for vapor sampling shall provide the laboratory with a list identifying the stack samples to be analyzed.

Particulate filter samples shall be analyzed at the appropriate facility as discussed in Section 8.9.3 and in accordance with Table 8-3.

If any requested analyses cannot be performed, the Process Engineering point-of-contact for vapor sampling shall be notified.

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8.10 QUALITY ASSURANCE AND QUALITY CONTROL

Vapor sampling and analysis shall be performed in accordance with approved QA plans. These plans are required to meet the HASQARD (DOE-RL 1998b) requirements. Validation of this compliance shall be either by a HASQARD assessment stating their quality program satisfactorily meets the appropriate requirements, or the quality program plan and applicable procedures will be submitted and approved prior to work performance on sampling or analytical work.

8.10.1 Sample Collection

Sampling shall be performed in accordance with approved procedures and work plans included within the job control system. All data sheets and log entries completed during the performance of sampling shall be copied and included within the job control system package. Each sample shall be uniquely identified and shall be traceable to the sampling location.

8.10.2 Sample Custody

Chain-of-custody will be carefully maintained to assure sample control at all times.

8.10.3 Trip Blanks and Field Blanks for Vapor and Particulate Samples

Trip Blanks are sampling devices prepared and handled in the same manner as samples, except that they are never opened in the field. Field Blanks are sampling devices prepared and handled in the same manner as the samples, but no tank gases are drawn through them.

8.10.4 Solid/Supernate/Liquid Sample QC

Sample QC and criteria are listed in Table 8-1. A duplicate or matrix spike duplicate, matrix spike, LCS, and method blank will be processed for every preparation batch of up to 20 samples of the same matrix (sludge and supernate are separate matrices) per SW-846, Chapter 1 (EPA 1997) and HASQARD (DOE-RL 1998b).

8.10.5 Laboratory Operations

Analytical procedures that are to be used for a sample and analysis plan shall be written and approved prior to the performance of analytical work within the laboratory. Analytical QC requirements are identified in Tables 8-1 and 8-3. The laboratory shall also use calibration and calibration check standards appropriate for the analytical instrumentation being used (see DOE

[1998] for definitions of QC samples and standards). The criteria presented are goals for demonstrating reliable method performance. It is understood that the laboratory will follow its internal QC system for required actions whenever QC failures occur. If sample QC failures occur or if all analyses cannot be performed (e.g., insufficient sample), analysts shall consult with supervisors/customers to determine the proper action. The laboratory should provide a suggested course of action at that time. All sample QC failures and limitations on the associated data shall be discussed in the narrative of the data report. Proper notification of all data not meeting QC requirements shall be included with the data.

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9.0 REFERENCES

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APPENDIX A

REGULATORY DRIVERS

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APPENDIX A

REGULATORY DRIVERS

Table A-1. Regulatory Drivers. (27 sheets)

CAS #	Constituent	40 CFR 355	40 CFR 372	WAC 173-460	WAC 173-401
100-00-5	p-Nitrochlorobenzene			X	
100-01-6	4-Nitroaniline		X	X	
100-02-7	4-Nitrophenol		X	X	X
100-25-4	1,4-Dinitrobenzene		X		
100-37-8	Diethylaminoethanol			X	
100-41-4	Ethyl benzene		X	X	X
100-42-5	Styrene		X	X	X
100-44-7	Benzyl chloride	X	X	X	X
100-61-8	N-Methylbenzenamine			X	
100-63-0	Phenylhydrazine			X	
100-74-3	N-Ethylmorpholine			X	
100-75-4	N-Nitrosopiperidine		X		
10025-67-9	Sulfur monochloride			X	
10025-73-7	Chromic chloride	X			X
10025-87-3	Phosphorus oxychloride	X		X	
10026-13-8	Phosphorus pentachloride	X		X	
10028-15-6	Ozone	X	X		
10034-93-2	Hydrazine sulfate		X		
10035-10-6	Hydrogen bromide			X	
10045-94-0	Mercuric nitrate				X
10049-04-4	Chlorine dioxide		X	X	
10061-02-6	trans-1,3-Dichloropropene		X		
101-05-3	Anilazine		X		
101-14-4	4,4'-Methylenebis(2-chloroaniline)		X	X	X
101-61-1	4,4'-Methylenebis(N, N-dimethyl)benzenamine		X		
101-68-8	Methylene bis(phenyl isocyanate)		X	X	X
101-77-9	4,4-Methylene dianiline		X	X	X
101-80-4	4,4'-Diaminodiphenyl ether		X	X	
101-84-8	Diphenyl ether			X	
101-90-6	Diglycidyl resorcinol ether		X	X	
10102-43-9	Nitric oxide	X		X	
10102-44-0	Nitrogen dioxide	X			
101200-48-0	Tribenuron methyl		X		
102-54-5	Dicyclopentadienyl iron			X	
102-81-8	2-N-Dibutylaminoethanol			X	
10210-68-1	Cobalt carbonyl as Co	X		X	X
10222-01-2	2,2-Dibromo-3-nitrilopropionamide		X		

Table A-1. Regulatory Drivers. (27 sheets)

CAS #	Constituent	40 CFR 355	40 CFR 372	WAC 173-460	WAC 173-401
10294-33-4	Boron tribromide			X	
10294-34-5	Boron trichloride	X	X		
103-85-5	Phenylthiourea	X			
104-12-1	p-Chlorophenyl isocyanate		X		
104-94-9	p-Anisidine		X		
10453-86-8	Resmethrin		X		
105-46-4	sec-Butyl acetate			X	
105-60-2	Caprolactam, vapor			X	X
105-60-2a	Caprolactam, dust			X	
105-67-9	2,4-Dimethylphenol		X		
10595-95-6	N-Nitrosomethylethylamine			X	
106-35-4	3-Heptanone			X	
106-42-3	p-Xylene		X		
106-44-5	4-Methylphenol		X		X
106-46-7	1,4-Dichlorobenzene		X	X	X
106-47-8	4-Chloroaniline		X		
106-49-0	p-Toluidine			X	
106-50-3	p-Phenylenediamine		X	X	X
106-51-4	p-Benzoquinone		X	X	X
106-87-6	Vinyl cyclohexene dioxide			X	
106-88-7	1,2-Epoxybutane		X	X	X
106-89-8	Epichlorohydrin	X	X	X	X
106-92-3	Allyl glycidyl ether			X	
106-93-4	Ethylene dibromide		X	X	X
106-97-8	Butane			X	
106-99-0	1,3-Butadiene		X	X	X
107-02-8	Acrolein	X	X	X	X
107-05-1	3-Chloropropene		X	X	X
107-06-2	1,2-Dichloroethane		X	X	X
107-07-3	Ethylene chlorohydrin	X		X	
107-11-9	Allylamine	X	X		
107-12-0	Propionitrile	X			
107-13-1	Acrylonitrile	X	X	X	X
107-15-3	Ethylene diamine	X		X	
107-16-4	2-Hydroxyacetonitrile	X			
107-18-6	2-Propen-1-ol	X	X	X	
107-19-7	Propargyl alcohol		X	X	
107-20-0	Chloroacetaldehyde			X	
107-21-1	Ethylene glycol		X	X	X
107-30-2	Chloromethyl methyl ether	X	X	X	X

Table A-1. Regulatory Drivers. (27 sheets)

CAS #	Constituent	40 CFR 355	40 CFR 372	WAC 173-460	WAC 173-401
107-31-3	Formic acid, methyl ester			X	
107-41-5	Hexylene glycol			X	
107-49-3	Tetraethyl pyrophosphate	X		X	
107-66-4	Dibutylphosphate			X	
107-87-9	2-Pentanone			X	
107-98-2	Propylene glycol monomethyl ether			X	
108-03-2	1-Nitropropane			X	
108-05-4	Acetic acid vinyl ester	X	X	X	X
108-10-1	4-Methyl-2-pentanone (MIBK)		X	X	X
108-11-2	Methyl isobutyl carbinol			X	
108-18-9	Diisopropylamine			X	
108-20-3	Bis(isopropyl) ether			X	
108-21-4	Isopropyl acetate			X	
108-24-7	Acetic anhydride			X	
108-31-6	Maleic anhydride (2,5-Furandione)		X	X	X
108-38-3	m-Xylene		X		
108-39-4	m-Cresol		X		X
108-43-0	Chlorophenols			X	
108-44-1	m-Toluidine			X	
108-45-2	1,3-Phenylenediamine		X		
108-46-3	Resorcinol (1,3-Benzenediol)			X	
108-60-1	Bis(2-Chloroisopropyl) ether		X		
108-83-8	Diisobutyl ketone			X	
108-84-9	sec-Hexyl acetate			X	
108-87-2	Methylcyclohexane			X	
108-88-3	Toluene		X	X	X
108-90-7	Chlorobenzene		X	X	X
108-91-8	Cyclohexylamine	X		X	
108-93-0	Cyclohexanol		X	X	
108-94-1	Cyclohexanone			X	
108-95-2	Phenol	X	X	X	X
108-98-5	Thiophenol	X		X	
109-06-8	2-Methylpyridine		X		
109-59-1	Isopropoxyethanol			X	
109-60-4	n-Propyl acetate			X	
109-66-0	n-Pentane			X	
109-73-9	n-Butylamine			X	
109-77-3	Malononitrile	X	X		
109-79-5	n-Butyl mercaptan			X	
109-86-4	2-Methoxyethanol		X	X	X

Table A-1. Regulatory Drivers. (27 sheets)

CAS #	Constituent	40 CFR 355	40 CFR 372	WAC 173-460	WAC 173-401
109-87-5	Methylal			X	
109-89-7	Diethylamine			X	
109-94-4	Ethyl formate			X	
109-99-9	Tetrahydrofuran			X	
110-00-9	Furan	X			
110-12-3	5-Methyl-2-hexanone			X	
110-19-0	Isobutyl acetate			X	
110-43-0	2-Heptanone			X	
110-49-6	2-Methoxyethyl acetate			X	
110-54-3	n-Hexane		X		X
110-54-3D	Hexane, other isomers			X	
110-57-6	trans-1,4-Dichloro-2-butene	X	X		
110-62-3	n-Valeraldehyde			X	
110-80-5	2-Ethoxyethanol		X	X	X
110-82-7	Cyclohexane		X	X	
110-83-8	Cyclohexene			X	
110-86-1	Pyridine		X	X	
110-89-4	Piperidine	X			
110-91-8	Morpholine			X	
111-15-9	2-Ethoxyethyl acetate			X	
111-30-8	Glutaraldehyde			X	
111-40-0	Diethylene triamine			X	
111-42-2	Diethanolamine		X	X	X
111-44-4	Bis(2-chloroethyl) ether	X	X	X	X
111-46-6D	Glycol ethers			X	X
111-65-9	n-Octane			X	
111-69-3	Hexanedinitrile	X			
111-76-2	2-Butoxyethanol			X	X
111-84-2	n-Nonane			X	
111-91-1	Bis(2-Chloroethoxy)methane		X		
1114-71-2	Pebulate		X		
111512-56-2	1,1-dichloro-1,2,3,3,3-pentafluoropropane (HCFC-225eb)		X		
111984-09-9	3,3'-Dimethoxybenzidine hydrochloride		X		
1120-71-4	1,3-Propane sultone		X	X	X
1129-41-5	Metolcarb (3-methylcholanthrene)	X			
1134-23-2	Cycloate		X		
114-26-1	Propoxur		X	X	X
115-07-1	Propene		X		
115-28-6	Chlorendic acid		X		
115-29-7	Endosulfan	X		X	

Table A-1. Regulatory Drivers. (27 sheets)

CAS #	Constituent	40 CFR 355	40 CFR 372	WAC 173-460	WAC 173-401
115-32-2	Dicofol		X		
115-86-6	Triphenyl phosphate			X	
115-90-2	Fensulfothion	X		X	
116-06-3	Aldicarb	X	X		
1163-19-5	Decabromodiphenyl oxide		X		
117-79-3	2-Aminoanthraquinone		X	X	
117-81-7	Bis(2-ethylhexyl) phthalate		X	X	X
118-52-5	1,3-Dichloro-5,5-Dimethyl hydantoin			X	
118-74-1	Hexachlorobenzene		X	X	X
118-96-7	2,4,6-Trinitrotoluene			X	
1189-85-1	tert-Butyl chromate, as CrO3			X	
119-38-0	Isolan	X			
119-90-4	3,3'-Dimethoxybenzidine		X	X	X
119-93-7	3,3'-Dimethylbenzidine.		X	X	X
120-12-7	Anthracene		X		
120-36-5	Dichloroprop		X		
120-58-1	Isosafrole		X		
120-71-8	p-Cresidine		X		
120-80-9	Catechol		X	X	X
120-82-1	1,2,4-Trichlorobenzene		X	X	X
120-83-2	2,4-Dichlorophenol		X		
12035-72-2	Nickel refinery dust				X
12079-65-1	Manganese cyclopentadienyl tricarbonyl			X	
121-14-2	2,4-Dinitrotoluene		X	X	X
121-44-8	Triethylamine		X	X	X
121-45-9	Trimethyl phosphite			X	
121-69-7	Dimethylaniline		X	X	X
121-75-5	Malathion		X	X	
121-82-4	Cyclonite			X	
12108-13-3	Methylcyclopentadienylmanganese tricarbonyl	X		X	X
12122-67-7	Zineb		X		
12125-02-9	Ammonium chloride (fume)			X	
122-34-9	Simazine		X		
122-39-4	N,N-Diphenylamine		X	X	
122-60-1	Phenyl glycidyl ether			X	
122-66-7	1,2-Diphenylhydrazine		X	X	X
123-19-3	4-Heptanone			X	
123-31-9	Hydroquinone	X	X	X	X
123-38-6	n-Propionaldehyde		X	X	X
123-42-2	Diacetone alcohol			X	

Table A-1. Regulatory Drivers. (27 sheets)

CAS #	Constituent	40 CFR 355	40 CFR 372	WAC 173-460	WAC 173-401
123-51-3	3-Methyl-1-butanol			X	
123-63-7	Paraldehyde		X		
123-72-8	n-Butyl aldehyde		X		
123-73-9	trans-2-Buten-1-al	X			
123-86-4	Acetic acid n-butyl ester			X	
123-91-1	1,4-Dioxan		X	X	X
123-92-2	Isoamyl acetate			X	
124-40-3	Dimethylamine		X	X	
124-73-2	Dibromotetrafluoroethane (Halon 2402)		X		
12427-38-2	Maneb		X		
126-72-7	Tris(2,3-dibromopropyl) phosphate		X		
126-73-8	Tributyl phosphate			X	
126-85-2	Nitrogen mustard N-oxide			X	
126-98-7	2-Methyl-2-propenenitrile	X	X	X	
126-99-8	Chloroprene		X	X	
12604-58-9	Ferrovanadium dust			X	
127-18-4	1,1,2,2-Tetrachloroethene		X	X	X
127-19-5	N,N-Dimethylacetamide			X	
127564-92-5	Dichloropentafluoropropane		X		
128-03-0	Potassium dimethyldithiocarbamate		X		
128-04-1	Sodium dimethyldithiocarbamate		X		
128-37-0	2,6-Bis(tert-butyl)-4-methylphenol			X	
128-66-5	CI Vat Yellow 4		X		
128903-21-9	2,2-Dichloro-1,1,1,3,3-pentafluoropropane (HCFC-225aa)		X		
129-00-0	Pyrene	X			
129-15-7	2-Methyl-1-nitroanthraquinone			X	
1300-73-8	Xylidine			X	
1303-28-2	Arsenic pentoxide	X			
1303-86-2	Boron oxide			X	
1303-96-4Ca	Borates, anhydrous			X	
1303-96-4Cb	Borates, pentahydrate			X	
1303-96-4Cc	Borates, decahydrate			X	
1304-82-1	Bismuth telluride			X	
1305-62-0	Calcium hydroxide			X	
1305-78-8	Calcium oxide			X	
1309-37-1	Iron oxide fume, Fe2O3 as Fe			X	
1309-48-4	Magnesium oxide fume			X	
1309-64-4	Antimony trioxide, as Sb			X	X
131-11-3	Dimethyl phthalate		X	X	X
131-52-2	Sodium pentachlorophenate		X		

Table A-1. Regulatory Drivers. (27 sheets)

CAS #	Constituent	40 CFR 355	40 CFR 372	WAC 173-460	WAC 173-401
1310-58-3	Potassium hydroxide			X	
1310-73-2	Sodium hydroxide			X	
13121-70-5	Cyhexatin			X	
1313-27-5	Molybdenum trioxide		X		
1314-13-2	Zinc oxide, fume			X	
1314-20-1	Thorium dioxide		X	X	
1314-62-1	Vanadium pentoxide	X		X	
1314-80-3	Phosphorus pentasulfide			X	
1314-84-7	Zinc phosphide (<10%)	X			
1319-77-3	Cresol polymers		X	X	X
13194-48-4	Ethoprop	X	X		
132-27-4	Sodium o-phenylphenoxide		X		
132-64-9	Dibenzofuran		X	X	X
1320-18-9	2,4-D propylene glycol butyl ether ester		X		
1321-64-8	Pentachloronaphthalene			X	
1321-65-9	Trichloronaphthalene			X	
1321-74-0	Divinyl benzene			X	
1327-53-3	Arsenic trioxide	X			
133-06-2	Captan		X	X	X
133-07-3	Folpet		X		
133-90-4	Chloramben		X	X	X
1330-20-7	Xylene		X	X	X
1332-21-4	Asbestos (fiberous)		X	X	X
1333-86-4	Carbon black			X	
1335-87-1	Hexachloronaphthalene		X	X	
1335-88-2	Tetrachloronaphthalene			X	
13356-08-6	Fenbutatin oxide		X		
1336-36-3	Polychlorinated biphenyls (PCBs)		X	X	X
1338-23-4	Methyl ethyl ketone peroxide			X	
134-29-2	o-Anisidine hydrochloride		X		
134-32-7	alpha-Naphthylamine		X	X	
13410-01-0	Sodium selenate	X			X
1344-28-1	Aluminum oxide (fibrous forms)		X		
1345-04-6	Antimony trisulfide				X
13463-39-3	Nickel carbonyl	X			X
13463-40-6	Iron pentacarbonyl, as Fe	X	X	X	
13474-88-9	1,1-Dichloro-1,2,2,3,3-pentafluoropropane (HCFC-225cc)		X		
13494-80-9C	Tellurium & compounds as Te			X	
135-20-6	Cupferron		X	X	
13530-65-9	Zinc chromates			X	

Table A-1. Regulatory Drivers. (27 sheets)

CAS #	Constituent	40 CFR 355	40 CFR 372	WAC 173-460	WAC 173-401
13552-44-8	4,4-Methylenedianiline dihydrochloride			X	
136-45-8	Dipropyl isocinchomeronate		X		
136-78-7	Sesone			X	
136013-79-1	1,3-Dichloro-1,1,2,3,3-pentafluoropropane (HCFC-225ea)		X		
13684-56-5	Desmedipham		X		
137-05-3	Methyl-2-cyanoacrylate			X	
137-26-8	Thiram		X	X	
137-41-7	Potassium n-methyldithiocarbamate		X		
137-42-8	Metam Sodium		X		
138-22-7	n-Butyl lactate			X	
138-93-2	Disodium cyanodithioimidocarbonate		X		
13838-16-9	Enflurane			X	
139-13-9	Nitrilotriacetic acid		X		
139-65-1	4,4'-Thiodianiline		X	X	
139-91-3	5-(Morpholinomethyl)-3-amino-2-oxazolidinone (furaltudone)			X	
1395-21-7	Subtilisins			X	
140-88-5	Ethylacrylate		X	X	X
141-32-2	Butylacrylate		X	X	
141-43-5	Ethanolamine			X	
141-66-2	Dicrotophos	X		X	
141-78-6	Acetic acid ethyl ester			X	
141-79-7	4-Methyl-3-penten-2-one			X	
142-59-6	Nabam		X		
142-64-3	Piperazine dihydrochloride			X	
142-82-5	n-Heptane			X	
143-33-9	Sodium cyanide	X			X
144-49-0	Fluoroacetic acid	X			
144-62-7	Oxalic acid			X	
14484-64-1	Ferbam		X	X	
1464-53-5	1,2,3,4-Diepoxybutane	X	X		
1477-55-0	m-Xylene-a,a'-diamine			X	
148-01-6	Dinitolamide			X	
148-79-8	Thiabendazole		X		
149-30-4	2-Mercaptobenzothiazole		X		
14977-61-8	Chromylchloride			X	
150-50-5	Merphos		X		
150-68-5	Monuron		X		
150-76-5	4-Methoxyphenol			X	
151-50-8	Potassium cyanide	X			X

Table A-1. Regulatory Drivers. (27 sheets)

CAS #	Constituent	40 CFR 355	40 CFR 372	WAC 173-460	WAC 173-401
151-56-4	Ethyleneimine	X	X	X	X
151-67-7	Halothane			X	
152-16-9	Octamethylpyrophosphoramide	X			
156-10-5	p-Nitrosodiphenylamine		X		
156-62-7	Calcium cyanamide		X	X	X
1563-66-2	Carbofuran	X	X	X	
1582-09-8	Trifluralin		X	X	X
15972-60-8	Alachlor		X		
16071-86-6	CI Direct Brown 95		X		
1615-80-1	N,N'-Diethylhydrazine			X	
16219-75-3	Ethylidene norbornene			X	
1634-04-4	Methyl tert-butyl ether		X	X	X
1649-08-7	1,2-dichloro-1,1-difluoroethane (HCFC-132b)		X		
16543-55-8	N-Nitrosonornicotine		X		
16752-77-5	Methomyl	X		X	
16842-03-8	Cobalt hydrocarbonyl			X	
1689-84-5	Bromoxynil		X		
1689-99-2	3,5-Dibromo-4-hydroxybenzonitrile		X		
1694-09-3	Benzyl violet 4b			X	
16984-48-8	Fluoride			X	
1717-00-6	1,1-Dichloro-1-fluoroethane		X		
1746-01-6	TCDD			X	X
17702-41-9	Decaborane	X		X	
17702-57-7	Formparanate	X			
17804-35-2	Benomyl		X	X	
1836-75-5	Nitrofen		X	X	
1861-40-1	Benefin		X		
189-55-9	Dibenzo[a,i]pyrene			X	X
189-64-0	Dibenzo[a,h]pyrene			X	
1897-45-6	Chlorothalonil		X		
19044-88-3	Oryzalin		X		
191-30-0	Dibenzo(a,l)pyrene			X	
1910-42-5	Paraquat dichloride	X	X		
1912-24-9	Atrazine		X	X	
1918-00-9	Dicamba		X		
1918-02-1	Picloram		X	X	
1918-16-7	Propachlor		X		
192-65-4	Dibenzo[a,e]pyrene			X	
1928-43-4	2,4-D 2-ethylhexyl ester		X		
19287-45-7	Diborane	X		X	

Table A-1. Regulatory Drivers. (27 sheets)

CAS #	Constituent	40 CFR 355	40 CFR 372	WAC 173-460	WAC 173-401
1929-73-3	2,4-D butoxyethyl ester		X		
1929-82-4	Nitrapyrin		X	X	
193-39-5	Indeno(1,2,3-cd)pyrene			X	X
1937-37-7	CI Direct Black 38		X		
19624-22-7	Pentaborane	X		X	
19666-30-9	Oxydiazon		X		
1982-69-0	Sodium dicamba		X		
1983-10-4	Tributyltin fluoride		X		
2032-65-7	Methiocarb	X	X		
20325-40-0	3,3'-Dimethoxybenzidine dihydrochloride		X		
20354-26-1	Methazole		X		
2039-87-4	o-Chlorostyrene			X	
205-82-3	Benzo[j]fluoranthene			X	
205-99-2	Benzo(b)fluoranthene			X	X
207-08-9	Benzo(k)fluoranthene			X	
20816-12-0	Osmium tetroxide		X	X	
20859-73-8	Aluminum phosphide	X	X		
2095-58-1	Boron trifluoride		X	X	
2104-64-5	EPN	X		X	
21087-64-9	Metribuzin		X	X	
21351-79-1	Cesium hydroxide			X	
2155-70-6	Tributyltin methacrylate		X		
2164-07-0	Dipotassium endothall		X		
2164-17-2	Fluometuron		X		
21725-46-2	Cyanazine		X		
2179-59-1	Allyl propyl disulfide			X	
218-01-9	Chrysene				X
2212-67-1	Molinate		X		
22224-92-6	Fenamiphos	X		X	
2234-13-1	Octachloronaphthalene		X	X	
2238-07-5	Diglycidyl ether	X		X	
224-42-0	Dibenz[a,j]acridine			X	
226-36-8	Dibenz[a,h]acridine			X	
22781-23-3	Bendiocarb		X		
2300-66-5	Dimethylamine dicamba		X		
2303-16-4	Diallate		X		
2303-17-5	Triallate		X		
2312-35-8	Propargite		X		
23135-22-0	Oxamyl	X			
23422-53-9	Formetanate hydrochloride	X			

Table A-1. Regulatory Drivers. (27 sheets)

CAS #	Constituent	40 CFR 355	40 CFR 372	WAC 173-460	WAC 173-401
23564-05-8	Thiophanate-methyl		X		
23564-06-9	Thiophanate ethyl		X		
2385-85-5	Mirex			X	
23950-58-5	Pronamide		X		
2425-06-1	Captafol			X	
2426-08-6	n-Butyl glycidyl ether			X	
2439-01-2	Chinomethionat		X		
2439-10-3	Dodine		X		
2465-27-2	Auramine (technical grade)			X	
25013-15-4	Vinyl toluene			X	
2524-03-0	Dimethyl chlorothiophosphate	X	X		
25311-71-1	Isofenphos		X		
25321-14-6	Dinitrotoluene		X		
25321-22-6	Dichlorobenzene		X		
25376-45-8	Toluenediamine		X		
2551-13-7	Trimethyl benzene			X	
2551-62-4	Sulfur hexafluoride			X	
25639-42-3	Methylcyclohexanol			X	
26002-80-2	Phenothrin		X		
2602-46-2	CI Direct Blue 6		X		
26140-60-3	Terphenyls			X	
2631-37-0	Promecarb	X			
26419-73-8	Tirpate	X			
2646-17-5	Oil orange SS			X	
26471-62-5	Toluene diisocyanate		X		
2655-15-4	2,3,5-Trimethylphenyl methylcarbamate		X		
26628-22-8	Sodium azide	X	X	X	
26644-46-2	Triforine		X		
26952-21-6	Iso-ocytl alcohol			X	
26952-23-8	Dichloropropene			X	
2698-41-1	o-Chlorobenylidene malonitrile			X	
2699-79-8	Sulfuryl fluoride		X	X	
2702-72-9	2,4-D sodium salt		X		
27314-13-2	Norflurazon		X		
2763-96-4	5-(Aminomethyl)-3-isoxazolol	X			
28057-48-9	D-trans Allethrin		X		
28249-77-6	Thiobencarb		X		
28300-74-5	Antimony potassium tartrate				X
2832-40-8	CI Disperse Yellow 3		X		
2837-89-0	2-Chloro-1,1,1,2-tetrafluoroethane (HCFC-124)		X		

Table A-1. Regulatory Drivers. (27 sheets)

CAS #	Constituent	40 CFR 355	40 CFR 372	WAC 173-460	WAC 173-401
28407-37-6	CI Direct Blue 218		X		
28434-86-8	3,3'-Dichloro-4,4'-diaminodiphenyl ether			X	
287-92-3	Cyclopentane			X	
29191-52-4	Anisidine (o-,p- isomers)			X	
2921-88-2	Chlorpyrifos			X	
29232-93-7	Pirimiphos methyl		X		
297-97-2	O,O-Diethyl O-pyrazinyl phosphoro- thioate	X			
2971-38-2	2,4-D chlorocrotyl ester		X		
2971-90-6	Clopidol			X	
298-00-0	Methyl parathion	X	X	X	
298-02-2	Phorate	X		X	
298-04-4	Disulfoton	X		X	
299-84-3	Ronnel			X	
299-86-5	Crufomate			X	
300-76-5	Naled		X	X	
301-04-2	Lead acetate			X	
301-12-2	Oxydemeton methyl		X		
302-01-2	Hydrazine	X	X	X	X
302-70-5	Nitrogen mustard N-oxide hydrochloride			X	
30560-19-1	Acephate		X		
306-83-2	2,2-Dichloro-1,1,1-trifluoroethane (HCFC-123)		X		
3068-88-0	B-Butyrolactone			X	
309-00-2	Aldrin	X	X	X	
3118-97-6	CI Solvent Orange 7		X		
31218-83-4	Propetamphos		X		
314-40-9	Bromacil		X	X	
315-18-4	Mexacarbate	X			
319-84-6	alpha-BHC		X	X	
319-85-7	beta-BHC			X	
330-54-1	Diuron		X	X	
330-55-2	Linuron		X		
33089-61-1	Amitraz		X		
333-41-5	Diazinon		X	X	
3333-52-6	Tetramethyl succinonitrile			X	
334-88-3	Diazomethane		X	X	X
3383-96-8	Temephos		X	X	
34014-18-1	Tebuthiuron		X		
34077-87-7	Dichlorotrifluoroethane		X		
34590-94-8	Dipropylene glycol methyl ether			X	
353-50-4	Carbon oxyfluoride			X	

Table A-1. Regulatory Drivers. (27 sheets)

CAS #	Constituent	40 CFR 355	40 CFR 372	WAC 173-460	WAC 173-401
353-59-3	Bromochlorodifluoromethane (Halon 1211)		X		
35367-38-5	Diflubenzuron		X		
354-11-0	1,1,1,2-Tetrachloro-2-fluoroethane (HCFC-121a)		X		
354-14-3	1,1,2,2-Tetrachloro-1-fluoroethane (HCFC-121)		X		
354-23-4	1,2-Dichloro-1,1,2-trifluoroethane (HCFC-123a)		X		
354-25-6	1-Chloro-1,1,2,2-tetrafluoroethane (HCFC-124a)		X		
35400-43-2	Sulprofos		X	X	
3547-04-4	DDE (p,p'-Dichlorodiphenyldichloroethylene)			X	X
35554-44-0	Imazalil		X		
35691-65-7	1-Bromo-1-(bromomethyl)-1,3-propanedicarbonitrile		X		
357-57-3	Brucine		X		
3653-48-3	Methoxone - sodium salt (4-Chloro-2-methylphenoxy acetate sodium salt)		X		
3687-31-8	Lead arsenate, as Pb3 (A2O4)2			X	
3689-24-5	Tetraethyldithiopyrophosphate (TEDP)	X		X	
3697-24-3	5-Methylchrysene			X	
3761-53-3	Ponceau MX		X	X	
3825-26-1	Ammonium perfluorooctanoate			X	
38727-55-8	Diethatyl ethyl		X		
39156-41-7	2,4-Diaminoanisole sulfate		X		
39196-18-4	Thiofanox	X			
39300-45-3	Dinocap		X		
39515-41-8	Fenpropathrin		X		
4016-14-2	Isopropyl glycidyl ether (IGE)			X	
40487-42-1	Pendimethalin		X		
4080-31-3	1-(3-Chloroallyl)-3,5,7-triaza-1-azoniaadamantane chloride		X		
4098-71-9	Isophorone diisocyanate	X		X	
41198-08-7	Profenofos		X		
4170-30-3	2-Butenaldehyde	X	X	X	
41766-75-0	3,3'-Dimethylbenzidine dihydrofluoride		X		
420-04-2	Cyanamide			X	
422-44-6	1,2-dichloro-1,1,2,3,3-pentafluoropropane (HCFC-225bb)		X		
422-48-0	2,3-dichloro-1,1,1,2,3-pentafluoropropane (HCFC-225ba)		X		
422-56-0	3,3-dichloro-1,1,1,2,2-pentafluoropropane (HCFC-225ca)		X		
42874-03-3	Oxyfluorfen		X		
431-86-7	1,2-dichloro-1,1,3,3,3-pentafluoropropane (HCFC-225da)		X		
43121-43-3	Triadimefon		X		

Table A-1. Regulatory Drivers. (27 sheets)

CAS #	Constituent	40 CFR 355	40 CFR 372	WAC 173-460	WAC 173-401
4549-40-0	N-Nitrosomethylvinylamine		X		
460-19-5	Cyanogen			X	
460-35-5	3-chloro-1,1,1-trifluoropropane (HCFC-253fb)		X		
463-51-4	Ketene			X	
463-58-1	Carbon oxide sulfide (COS)		X	X	X
465-73-6	Isodrin	X	X		
4680-78-8	CI Acid Green 3		X		
4685-14-7	Paraquat			X	
479-45-8	Tetryl			X	
492-80-8	Auramine		X		
50-00-0	Formaldehyde	X	X	X	X
50-07-7	Mitomycin C	X			
50-29-3	4,4-DDT			X	
50-32-8	Benzo(a)pyrene			X	X
504-24-5	4-Aminopyridine	X			
504-29-0	2-Aminopyridine			X	
50471-44-8	Vinclozolin		X		
505-60-2	Mustard gas	X	X		
506-61-6	Potassium silver cyanide	X			
506-68-3	Cyanogen bromide	X			
506-77-4	Cyanogen chloride			X	
507-55-1	1,3-dichloro-1,1,2,2,3-pentafluoropropane (HCFC-225cb)		X		
509-14-8	Tetranitromethane	X		X	
51-03-6	Piperonyl Butoxide		X		
51-12-5	Cyanides, as CN			X	X
51-21-8	Fluorouracil (5-Fluorouracil)	X	X		
51-28-5	2,4-Dinitrophenol		X	X	X
51-75-2	Nitrogen mustard	X	X		
51-79-6	Ethyl carbamate (urethane)		X		X
510-15-6	Chlorobenzilate		X	X	X
51235-04-2	Hexazinone		X		
5124-30-1	Methylene-bis-(4-cyclo-hexylisocyanate)			X	
51338-27-3	Diclofop-ME		X		
51630-58-1	Fenvalerate		X		
52-51-7	2-Bromo-2-nitropropane-1,3-diol (Bronopol)		X		
52-68-6	Trichlorfon		X		
52-85-7	Famphur		X		
5234-68-4	Carboxin		X		
52645-53-1	Permethrin		X		
528-29-0	Dinitrobenzene, all isomers		X	X	

Table A-1. Regulatory Drivers. (27 sheets)

CAS #	Constituent	40 CFR 355	40 CFR 372	WAC 173-460	WAC 173-401
53-70-3	Dibenz[a,h]anthracene			X	X
53-96-3	2-Acetylaminofluorene		X	X	X
531-82-8	N-(4-(5-Nitro-2-furyl)-2-thiazolyl)acetamide			X	
532-27-4	a-Chloroacetophenone		X	X	X
533-74-4	Dazomet		X		
534-52-1	4,6-Dinitro-o-cresol	X	X	X	X
53404-19-6	Bromacil, lithium salt		X		
53404-37-8	2,4-D 2-ethyl-4-methylpentyl ester		X		
53404-60-7	Dazomet, sodium salt		X		
5344-82-1	1-(o-Chlorophenyl)thiourea	X			
54-11-5	Nicotine	X		X	
540-59-0	1,2-Dichloroethylene		X	X	
540-73-8	1,2-Dimethylhydrazine			X	X
540-84-1	2,2,4-Trimethylpentane			X	X
540-88-5	tert-Butyl acetate			X	
541-41-3	Ethyl chloroformate		X		
541-53-7	Dithiobiuret, syb 2,4-Dithiobiuret	X	X		
541-73-1	1,3-Dichlorobenzene		X		
541-85-5	Ethyl amyl ketone			X	
542-75-6	1,3-Dichloropropene		X		X
542-76-7	3-Chloropropionitrile	X	X		
542-88-1	Dichloromethyl ether	X	X	X	X
542-92-7	Cyclopentadiene			X	
55-18-5	N-Nitrosodiethylamine		X	X	
55-21-0	Benzamide		X		
55-38-9	Fenthion		X	X	
55-63-0	Nitroglycerin		X	X	
55-91-4	Diisopropylfluorophosphate (DFP)	X			
552-30-7	Trimellitic anhydride			X	
55290-64-7	Dimethipin		X		
554-13-2	Lithium carbonate		X		
55406-53-6	3-Iodo-2-propynyl n-butylcarbamate		X		
555-84-9	1-(5-Nitrofurfurylidene)amino)-2-imidazolidinone			X	
556-52-5	Glycidol			X	
556-61-6	Methyl isothiocyanate	X	X		
55720-99-5	Chlorinated diphenyl oxide			X	
55738-54-0	Trans-2((Dimethylamino)methylimino)-5-(2-(5-nitro-2-furyl) vinyl-1,3,4-oxadiazole			X	
558-13-4	Carbon tetrabromide			X	
5598-13-0	Chlorpyrifos methyl		X		
56-23-5	Carbon tetrachloride		X	X	X

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CAS #	Constituent	40 CFR 355	40 CFR 372	WAC 173-460	WAC 173-401
56-35-9	Bis(tributyltin) oxide		X		
56-38-2	Parathion	X	X	X	X
56-55-3	Benzo(a)anthracene			X	X
563-12-2	Ethion	X		X	
563-47-3	3-Chloro-2-methyl-1-propene		X		
563-80-4	3-Methyl-2-butanone			X	
569-64-2	CI Basic Green 4		X		
57-14-7	1,1-Dimethylhydrazine	X	X	X	X
57-24-9	Strychnine	X		X	
57-33-0	Pentobarbital sodium		X		
57-41-0	Phenytoin		X		
57-47-6	Physostigmine	X			
57-57-8	B-Propiolactone	X	X	X	X
57-64-7	Physostigmine salicylate	X			
57-74-9	Chlordane	X	X	X	X
57-97-6	7,12-Dimethylbenz[a]anthracene				X
5714-22-7	Sulfur pentafluoride			X	
57213-69-1	Triclopyr, triethylammonium salt		X		
576-26-1	2,6-Dimethylphenol		X		
58-89-9	gamma-BHC (Lindane)	X	X	X	X
583-60-8	o-Methylcyclohexanone			X	
584-84-9	2,4-Toluene diisocyanate	X		X	X
59-87-0	Nitrofurazone			X	
59-89-2	N-Nitrosomorpholine		X	X	X
5902-51-2	Terbacil		X		
591-78-6	2-Hexanone			X	
592-62-1	Methyl azoxymethyl acetate			X	
593-60-2	Vinyl bromide			X	X
59355-75-8	Methyl acetylene-propadiene mixture (MAPP)			X	
594-42-3	Perchloromethyl mercaptan	X	X	X	
594-72-9	1,1-Dichloro-1-nitroethane			X	
59669-26-0	Thiodicarb		X		
60-09-3	4-Aminoazobenzene		X		
60-11-7	p-Dimethylaminoazobenzene		X	X	X
60-29-7	Ethyl ether			X	
60-34-4	Methylhydrazine	X	X	X	X
60-35-5	Acetamide		X	X	X
60-41-3	Strychnine {strychnidin-10-one}	X			
60-51-5	Dimethoate	X	X		
60-57-1	Dieldrin			X	

Table A-1. Regulatory Drivers. (27 sheets)

CAS #	Constituent	40 CFR 355	40 CFR 372	WAC 173-460	WAC 173-401
600-25-9	1-Chloro-1-nitropropane			X	
60168-88-9	Fenarimol		X		
602-87-9	5-Nitroacenaphthene			X	
60207-90-1	Propiconazole		X		
603-34-9	Triphenyl amine			X	
606-20-2	2,6-Dinitrotoluene		X		
61-82-5	Amitrole		X	X	
612-82-8	3,3'-Dimethylbenzidine dihydrochloride		X		
612-83-9	3,3'-Dichlorobenzidine dihydrochloride		X		
613-35-4	N,N-Diacetylbenzidine			X	
615-05-4	2,4-Diaminoanisole		X		
615-28-1	1,2-Phenylenediamine dihydrochloride		X		
615-53-2	N-Nitroso-N-methylurethane			X	
62-38-4	Phenylmercury acetate	X			X
62-53-3	Aniline	X	X	X	X
62-55-5	Thioacetamide (Ethanethioamide)		X		
62-56-6	Thiourea		X		
62-73-7	Dichlorvas	X	X	X	X
62-74-8	Fluoroacetic acid, sodium salt (Fratol)	X	X	X	
62-75-9	N-Nitroso-N,N-dimethylamine	X	X	X	X
621-64-7	N-Nitroso-di-n-propylamine		X		
62207-76-5	Fluomine	X			X
624-18-0	1,4-Phenylenediamine dihydrochloride		X		
624-83-9	Methyl isocyanate	X	X	X	X
62476-59-9	Acifluorfen, sodium salt		X		
626-17-5	m-Phthalodinitrile			X	
626-38-0	sec-Amyl acetate			X	
627-13-4	Nitric acid, propyl ester			X	
628-63-7	n-Amyl acetate			X	
628-96-6	Ethylene glycol dinitrate			X	
62924-70-3	Flumetralin		X		
63-25-2	Carbaryl		X	X	X
63-92-3	Phenoxybenzamine hydrochloride			X	
630-20-6	1,1,1,2-Tetrachloroethane		X		
636-21-5	o-Toluidine hydrochloride		X	X	
638-21-1	Phenylphosphine			X	
639-58-7	Triphenyltin chloride	X	X		
63938-10-3	Chlorotetrafluoroethane		X		
64-00-6	m-Cumenyl methylcarbamate	X			
64-17-5	Ethyl alcohol			X	

Table A-1. Regulatory Drivers. (27 sheets)

CAS #	Constituent	40 CFR 355	40 CFR 372	WAC 173-460	WAC 173-401
64-18-6	Formic acid		X	X	
64-19-7	Acetic acid			X	
64-67-5	Diethyl sulfate		X	X	X
64-75-5	Tetracycline hydrochloride		X		
640-19-7	Fluoroacetamide	X			
64091-91-4	4-(Methylnitrosamino)-1-(3-pyridyl)-1-butanone			X	
6423-43-4	Propylene glycol dinitrate			X	
644-64-4	Dimetilan	X			
6459-94-5	CI Acid Red 114		X		
6484-52-2	Ammonium nitrate (solution)		X		
64902-72-3	Chlorsulfuron		X		
64969-34-2	3,3'-Dichlorobenzidinesulfate		X		
6533-73-9	Thallium(I) carbonate	X			
66441-23-4	Fenoxaprop ethyl		X		
67-45-8	Furazolidone			X	
67-56-1	Methyl alcohol		X	X	X
67-63-0	2-Propyl alcohol		X	X	
67-64-1	2-Propanone (Acetone)			X	
67-66-3	Chloroform	X	X	X	X
67-72-1	Hexachloroethane		X	X	X
67485-29-4	Hydramethylnon		X		
68-11-1	Thioglycolic acid			X	
68-12-2	Dimethylformamide		X	X	X
68-76-8	Triaziquone		X		
680-31-9	Hexamethylphosphoramide		X	X	X
68085-85-8	Cyhalothrin		X		
681-84-5	Methyl silicate			X	
68359-37-5	Cyfluthrin		X		
684-16-2	Hexafluoroacetone			X	
684-93-5	N-Nitroso-N-methylurea		X	X	X
68476-85-7	Liquified petroleum gas			X	
6923-22-4	Monocrotophos	X		X	
69409-94-5	Fluvalinate		X		
696-28-6	Dichlorophenylarsine	X		X	
69806-50-4	Fluazifop-butyl		X		
70-30-4	Hexachlorophene		X		
709-98-8	Propanil		X		
71-23-8	n-Propyl alcohol			X	
71-36-3	n-Butanol		X	X	
71-43-2	Benzene		X	X	X

Table A-1. Regulatory Drivers. (27 sheets)

CAS #	Constituent	40 CFR 355	40 CFR 372	WAC 173-460	WAC 173-401
71-55-6	1,1,1-Trichloroethane		X	X	X
71751-41-2	Abamectin		X		
72-20-8	Endrin	X		X	
72-43-5	Methoxychlor		X	X	X
72-57-1	Trypan blue		X		
72178-02-0	Fomesafen		X		
72490-01-8	Fenoxycarb		X		
7287-19-6	Prometryn		X		
74-83-9	Bromomethane	X	X	X	X
74-85-1	Ethylene		X		
74-87-3	Chloromethane		X	X	X
74-88-4	Iodomethane		X	X	X
74-89-5	Methylamine			X	
74-90-8	Hydrogen cyanide	X	X	X	
74-93-1	Thiomethanol	X	X	X	
74-95-3	Dibromomethane		X		
74-96-4	Ethyl bromide			X	
74-97-5	Bromochloromethane			X	
74-99-7	Methylacetylene			X	
74051-80-2	Sethoxydim		X		
7429-90-5	Aluminum		X	X	
7429-90-5Ca	Aluminum, Al alkyls			X	
7429-90-5Cb	Aluminum, as AL pyro powders			X	
7429-90-5Cc	Aluminum, as Al soluble salts			X	
7429-90-5Ce	Aluminum, as Al welding fumes			X	
7439-89-6D	Iron salts, soluble as Fe			X	
7439-92-1	Lead		X		
7439-92-1D	Lead compounds			X	
7439-96-5	Manganese		X		X
7439-96-5Ca	Manganese dust & compounds			X	
7439-96-5Cb	Manganese fume			X	
7439-97-6	Mercury		X		X
7439-97-6Ca	Mercury, Aryl & inorganic cmpd			X	
7439-97-6Cb	Mercury, as Hg Alkyl compounds			X	
7439-97-6Cc	Mercury, vapors except alkyl			X	
7439-98-7Ca	Molybdenum, insoluble cpds			X	
7439-98-7Cb	Molybdenum, as Mo soluble cpds			X	
7440-02-0	Nickel		X		X
7440-02-0C	Nickel compounds			X	
7440-06-4	Platinum, metal			X	

Table A-1. Regulatory Drivers. (27 sheets)

CAS #	Constituent	40 CFR 355	40 CFR 372	WAC 173-460	WAC 173-401
7440-06-4C	Platinum, soluble salts as Pt			X	
7440-16-6	Rhodium			X	
7440-16-6Ca	Rhodium, insoluble compounds			X	
7440-16-6Cb	Rhodium, soluble compounds			X	
7440-22-4	Silver		X	X	
7440-22-4Da	Silver, soluble compounds as Ag			X	
7440-25-7C	Tantalum, metal & oxide dusts			X	
7440-28-0	Thallium		X		
7440-28-0C	Thallium, soluble compounds, Tl			X	
7440-31-5	Tin, oxide & inorganic except SnH4			X	
7440-31-5a	Tin, metal			X	
7440-31-5C	Tin, organic compounds, as Sn			X	
7440-33-7Ca	Tungsten, insoluble compounds			X	
7440-33-7Cb	Tungsten, soluble compounds			X	
7440-36-0	Antimony		X		X
7440-36-0C	Antimony & compounds as Sb			X	
7440-38-2	Arsenic		X		X
7440-38-2C	Arsenic and inorganic arsenic compounds			X	
7440-39-3	Barium		X		
7440-39-3Da	Barium, soluble compounds Ba			X	
7440-41-7	Beryllium		X	X	X
7440-43-9	Cadmium		X	X	X
7440-47-3	Chromium		X	X	X
7440-47-3Da	Chromium, hexavalent metal and compounds			X	
7440-47-3Db	Chromium (II) compounds, as Cr			X	
7440-47-3Dc	Chromium (III) compounds, Cr			X	
7440-48-4	Cobalt		X		X
7440-48-4a	Cobalt as Co metal dust and fume			X	
7440-50-8	Copper		X	X	
7440-50-8C	Copper, Dusts and mists, as Cu			X	
7440-58-6	Hafnium			X	
7440-61-1C	Uranium, insoluble & soluble			X	
7440-62-2	Vanadium		X		
7440-65-5C	Yttrium, metal and compounds as Y			X	
7440-66-6	Zinc		X		
7440-67-7C	Zirconium compounds, as Zr			X	
7440-74-6C	Indium, & compounds as In			X	
7446-09-5	Sulfur dioxide	X			
7446-18-6	Thallium(I) sulfate	X			
7446-27-7	Lead phosphate			X	

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CAS #	Constituent	40 CFR 355	40 CFR 372	WAC 173-460	WAC 173-401
748-79-4	Mercuric chloride				X
7488-56-4	Selenium sulfide				X
75-00-3	Chloroethane		X	X	X
75-01-4	1-Chloroethene		X	X	X
75-04-7	Ethylamine			X	
75-05-8	Acetonitrile		X	X	X
75-07-0	Acetaldehyde		X	X	X
75-08-1	Ethyl mercaptan			X	
75-09-2	Dichloromethane (Methylene Chloride)		X	X	X
75-12-7	Formamide			X	
75-15-0	Carbon disulfide	X	X	X	X
75-21-8	Oxirane	X	X	X	X
75-25-2	Tribromomethane		X	X	X
75-27-4	Bromodichloromethane		X		
75-31-0	Isopropylamine			X	
75-34-3	1,1-Dichloroethane		X	X	X
75-35-4	1,1-Dichloroethene		X	X	X
75-43-4	Dichlorofluoromethane		X	X	
75-44-5	Phosgene	X	X	X	X
75-45-6	Chlorodifluoromethane		X	X	
75-47-8	Iodoform			X	
75-50-3	Trimethylamine			X	
75-52-5	Nitromethane			X	
75-55-8	2-Methylaziridine	X	X	X	X
75-56-9	Propylene oxide	X	X	X	X
75-61-6	Difluorodibromomethane			X	
75-63-8	Trifluorobromomethane		X	X	
75-65-0	2-Methyl-2-propanol		X	X	
75-68-3	1,1-Difluoro-1-chloroethane		X		
75-69-4	Trichlorofluoromethane		X	X	
75-71-8	Dichlorodifluoromethane		X	X	
75-72-9	Chlorotrifluoromethane [3,4]		X		
75-74-1	Tetramethyl lead, as Pb	X		X	X
75-77-4	Trimethylchlorosilane	X	X		
75-78-5	Dimethyldichlorosilane	X	X		
75-79-6	Methyltrichlorosilane	X	X		
75-86-5	2-Methyllactonitrile	X	X		
75-88-7	2-Chloro-1,1,1-trifluoroethane (HCFC-133a)		X		
75-99-0	2,2-Dichloropropionic acid			X	
7550-45-0	Titanium tetrachloride	X	X	X	X

Table A-1. Regulatory Drivers. (27 sheets)

CAS #	Constituent	40 CFR 355	40 CFR 372	WAC 173-460	WAC 173-401
7553-56-2	Iodine			X	
7572-29-4	Dichloroacetylene			X	
7580-67-8	Lithium hydride	X		X	
759-73-9	N-Nitroso-N-ethylurea		X	X	
759-94-4	EPTC		X		
76-01-7	Pentachloroethane		X		
76-02-8	Trichloroacetyl chloride	X	X		
76-03-9	Trichloroacetic acid			X	
76-06-2	Chloropicrin		X	X	
76-11-9	1,1,1,2-Tetrachloro-2,2-difluoroethane			X	
76-12-0	1,1,2,2-Tetrachloro-1,2-difluoroethane			X	
76-13-1	1,2,2-Trichlorotrifluoroethane (Freon 113)		X	X	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane		X	X	
76-15-3	Chloropentafluoroethane		X	X	
76-22-2	Camphor, synthetic			X	
76-44-8	Heptachlor		X	X	X
76-87-9	Triphenyltin hydroxide		X		
7616-94-6	Perchloryl fluoride			X	
7631-90-5	Sodium bisulfite			X	
7632-00-0	Sodium nitrite		X		
764-41-0	1,4-Dichloro-2-butene		X	X	
7646-85-7	Zinc chloride fume			X	
7647-01-0	Hydrogen chloride	X	X	X	X
765-34-4	Glycidylaldehyde			X	
76578-14-8	Quizalofop-ethyl		X		
7664-38-2	Phosphoric acid		X	X	
7664-39-3	Hydrogen fluoride	X	X	X	X
7664-41-7	Ammonia	X	X	X	
7664-93-9	Sulfuric acid	X	X	X	
768-52-5	N-Isopropylaniline			X	
7681-57-4	Sodium metabisulfite			X	
7696-12-0	Tetramethrin		X		
7697-37-2	Nitric acid/Nitrate	X	X	X	
77-47-4	Hexachlorocyclopentadiene	X	X	X	X
77-73-6	Dicyclopentadiene		X	X	
77-78-1	Dimethyl sulfate	X	X	X	X
7719-09-7	Thionyl chloride			X	
7719-12-2	Phosphorus trichloride	X		X	
7722-84-1	Hydrogen peroxide	X		X	
7722-88-5	Tetrasodium pyrophosphate			X	

Table A-1. Regulatory Drivers. (27 sheets)

CAS #	Constituent	40 CFR 355	40 CFR 372	WAC 173-460	WAC 173-401
7723-14-0	Phosphorus	X	X	X	X
7726-95-6	Bromine	X	X	X	
77501-63-4	Lactofen		X		
7758-01-2	Potassium bromate		X		
7758-97-6	Lead chromate, as Cr			X	
7773-06-0	Ammonium sulfamate			X	
7782-41-4	Fluorine	X	X	X	
7782-49-2	Selenium		X		X
7782-49-2C	Selenium compounds, as Se			X	
7782-50-5	Chlorine	X	X	X	X
7782-65-2	Germanium tetrahydride			X	
7782-82-3	Sodium selenite				X
7783-00-8	Selenium dioxide	X			
7783-06-4	Hydrogen sulfide	X	X	X	
7783-07-5	Hydrogen selenide, as Se	X		X	
7783-20-2	Ammonium sulfate		X		
7783-41-7	Oxygen difluoride			X	
7783-54-2	Nitrogen trifluoride			X	
7783-60-0	Sulfur tetrafluoride	X		X	
7783-70-2	Antimony pentafluoride	X			X
7783-79-1	Selenium hexafluoride, as Se			X	X
7783-80-4	Tellurium hexafluoride, as Te	X		X	
7784-42-1	Arsine	X		X	X
7786-34-7	Mevinphos	X	X	X	
7789-30-2	Bromine pentafluoride			X	
7790-91-2	Chlorine trifluoride			X	
7791-12-0	Thallium(I) chloride	X			
78-00-2	Tetraethyl lead	X		X	X
78-10-4	Ethyl silicate			X	
78-30-8	Triorthocresyl phosphate			X	
78-34-2	Dioxathion	X		X	
78-48-8	S,S,S-Tributyltrithiophosphate (DEF)		X		
78-59-1	Isophorone			X	X
78-82-0	2-Cyanopropane	X			
78-83-1	2-Methylpropyl alcohol			X	
78-84-2	2-Methylpropionaldehyde		X		
78-87-5	1,2-Dichloropropane		X	X	X
78-88-6	2,3-Dichloropropene		X		
78-92-2	1-Methylpropyl alcohol		X	X	
78-93-3	2-Butanone (Methyl ethyl ketone)		X	X	X

Table A-1. Regulatory Drivers. (27 sheets)

CAS #	Constituent	40 CFR 355	40 CFR 372	WAC 173-460	WAC 173-401
78-94-4	3-Buten-2-one	X			
7803-51-2	Phosphine	X	X	X	X
7803-52-3	Stibine			X	
7803-62-5	Silicon tetrahydride			X	
79-00-5	1,1,2-Trichloroethane		X	X	X
79-01-6	1,1,2-Trichloroethylene		X	X	X
79-04-9	Chloroacetyl chloride			X	
79-06-1	Acrylamide	X	X	X	X
79-09-4	Propanoic acid			X	
79-10-7	2-Propenoic acid		X	X	X
79-11-8	Chloroacetic acid	X	X	X	X
79-19-6	Thiosemicarbazide	X	X		
79-20-9	Methyl acetate			X	
79-21-0	Peracetic acid	X	X		
79-22-1	Methyl chlorocarbonate	X	X		
79-24-3	Nitroethane			X	
79-27-6	Acetylene tetrabromide			X	
79-34-5	1,1,2,2-Tetrachloroethane		X	X	X
79-41-4	Methacrylic acid			X	
79-44-7	Dimethylcarbamoyl chloride		X	X	X
79-46-9	2-Nitropropane		X	X	X
794-93-4	Panfuran S (dihydroxymethylfuratrizine)			X	
80-05-7	4,4-Isopropylidenediphenol		X		
80-15-9	Cumene hydroperoxide		X		
80-62-6	Methyl methacrylate		X	X	X
8001-35-2	Toxaphene	X	X	X	X
8001-58-9	Creosote		X	X	
8002-74-2	Paraffin wax fume			X	
8003-34-7	Pyrethrum			X	
8006-64-2	Turpentine			X	
8012-95-1	Oil mist, mineral			X	
8022-00-2	Methyl demeton			X	
8030-30-6	Rubber solvent (Naphtha)			X	
8032-32-4	VM & P Naphtha			X	
8052-42-4	Asphalt (petroleum) fumes			X	
8065-48-3	Demeton	X		X	
81-07-2	Saccharin		X		
81-81-2	Warfarin (>0.3%)	X		X	
81-88-9	CI Food Red 15		X		
812-04-4	1,1-Dichloro-1,2,2-trifluoroethane (HCFC-123b)		X		

Table A-1. Regulatory Drivers. (27 sheets)

CAS #	Constituent	40 CFR 355	40 CFR 372	WAC 173-460	WAC 173-401
82-28-0	1-Amino-2-methylanthraquinone		X		
82-68-8	Pentachloronitrobenzene (PCNB)		X	X	X
822-06-0	Hexamethylene diisocyanate			X	X
82657-04-3	Bifenthrin		X		
83-26-1	Pindone			X	
83-79-4	Rotenone			X	
834-12-8	Ametryn		X		
838-88-0	4,4'-Methylenebis(2-methylaniline)			X	
84-66-2	Diethyl phthalate			X	
84-74-2	Di-n-butylphthalate		X	X	X
842-07-9	CI Solvent Yellow 14		X		
85-00-7	Diquat			X	
85-01-8	Phenanthrene		X		
85-44-9	Phthalic anhydride		X	X	X
86-30-6	N-Nitrosodiphenylamine		X	X	
86-50-0	Azinphos-methyl	X		X	
86-88-4	alpha-Naphthylthiourea	X		X	
87-62-7	2,6-Xylidine		X		
87-68-3	Hexachlorobutadiene		X	X	X
87-86-5	Pentachlorophenol		X	X	X
872-50-4	N-Methyl-2-pyrrolidone		X		
88-06-2	2,4,6-Trichlorophenol		X	X	X
88-72-2	Nitrotoluene			X	
88-75-5	2-Nitrophenol		X		
88-85-7	2-sec-Butyl-4,6-dinitrophenol; syn Dinoseb	X	X		
88-89-1	Picric acid		X	X	
88671-89-0	Myclobutanil		X		
89-72-5	o-sec-Butylphenol			X	
90-04-0	o-Anisidine		X	X	X
90-43-7	2-Phenylphenol		X		
90-94-8	Michler's ketone		X		
9006-42-2	Metiram		X		
90454-18-5	Dichloro-1,1,2-trifluoroethane		X		
90982-32-4	Chlorimuron ethyl		X		
91-08-7	Tolylene diisocyanate {1,3-diisocyanatomethylbenzene}	X	X		
91-20-3	Naphthalene		X	X	X
91-22-5	Quinoline		X	X	X
91-59-8	2-Napthylamine		X		
91-94-1	3,3 -Dichlorobenzidine		X	X	X
92-52-4	1,1`-Biphenyl		X	X	X

Table A-1. Regulatory Drivers. (27 sheets)

CAS #	Constituent	40 CFR 355	40 CFR 372	WAC 173-460	WAC 173-401
92-67-1	4-Aminobiphenyl		X	X	X
92-84-2	Phenothiazine			X	
92-87-5	Benzidine		X	X	X
92-93-3	4-Nitrobiphenyl		X	X	X
924-16-3	N-Nitrosodi-n-butylamine		X	X	
924-42-5	N-Methylolacrylamide		X		
93-65-2	Mecoprop = MCPP		X		
93-76-5	2,4,5-T			X	
94-11-1	2,4-D isopropyl ester		X		
94-36-0	Benzoyl Peroxide		X	X	
94-58-6	Dihydrosafrole		X		
94-59-7	Safrole		X		
94-74-6	MCPA		X		
94-75-7	2,4-D		X	X	X
94-80-4	2,4-D butyl ester		X		
94-82-6	2,4-DB		X		
944-22-9	Fonofos	X		X	
95-13-6	Indene			X	
95-47-6	o-Xylene		X		
95-48-7	o-Cresol	X	X		X
95-49-8	o-Chlorotoluene			X	
95-50-1	1,2-Dichlorobenzene		X	X	
95-53-4	o-Toluidine (2-methylaniline)		X	X	X
95-54-5	1,2-Phenylenediamine		X		
95-63-6	1,2,4-Trimethylbenzene		X		
95-69-2	P-Chloro-o-toluidine		X		
95-80-7	Toluene-2,4-diamine		X	X	X
95-95-4	2,4,5-Trichlorophenol		X	X	X
957-51-7	Diphenamid		X		
96-09-3	Styrene oxide		X	X	X
96-12-8	1,2-Dibromo-3-chloropropane		X	X	X
96-18-4	1,2,3-Trichloropropane		X	X	
96-22-0	3-Pentanone			X	
96-33-3	Methyl acrylate		X	X	
96-45-7	Ethylenethiourea		X	X	X
96-69-5	Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl) sulfide			X	
961-11-5	Tetrachlorvinphos		X		
97-23-4	Dichlorophene		X		
97-56-3	o-Aminoazotoluene		X	X	
97-77-8	Disulfiram			X	

Table A-1. Regulatory Drivers. (27 sheets)

CAS #	Constituent	40 CFR 355	40 CFR 372	WAC 173-460	WAC 173-401
98-00-0	Furfuryl alcohol			X	
98-01-1	Furfural			X	
98-05-5	Benzenearsonic acid	X			
98-07-7	Benzotrichloride	X	X	X	X
98-51-1	p-tert-Butyltoluene			X	
98-82-2	Cumene			X	
98-82-8	(1-Methylethyl)benzene		X		X
98-83-9	Methylstyrene			X	
98-86-2	Acetophenone		X	X	X
98-87-3	Benzal chloride	X	X		
98-88-4	Benzoyl chloride		X		
98-95-3	Nitrobenzene	X	X	X	X
989-38-8	CI Basic Red 1		X		
99-30-9	Dichloran		X		
99-55-8	5-Nitro-o-toluidine		X		
99-59-2	5-Nitro- o-anisidine		X		
99-65-0	1,3-Dinitrobenzene		X		
999-61-1	2-Hydroxypropyl acrylate			X	
I4	Aluminum smelter polyaromatic hydrocarbon emissions			X	
I51	Cotton dust, raw			X	
NA20	Welding fumes			X	
NA22	Fine mineral fibers			X	
NA23	Fibrous glass dust			X	
NA24	Dioxins and furans			X	
NA25	Coke oven emissions			X	X
PAH	Polyaromatic hydrocarbons (PAH)			X	X
UN6	Isopropyl oils			X	
UN8	Nitrofurans			X	

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APPENDIX B

TANK FARM TRANSITION PROJECT UNITS EMITTING OR HAVING THE POTENTIAL TO EMIT HAZARDOUS OR RADIOACTIVE GASES

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APPENDIX B

TANK FARM TRANSITION PROJECT UNITS EMITTING OR HAVING THE POTENTIAL TO EMIT HAZARDOUS OR RADIOACTIVE GASES

Table B-1. Tank Farm Transition Project Units Emitting or Having the Potential to Emit Hazardous and/or Radioactive Gases. (7 Sheets)

Stack Number or Emission Point	Facility
200E Paint	200 East Paint Shop
200W Paint	200 West Paint Shop
204AR	Waste Unloading Facility
213-W-TK-1	200 West Decontamination Tank - near 272-WA. Documentation is being researched to determine whether the tank has received waste in the past. It has and continues to receive rain water and is periodically pumped. Prior to being pumped, tank water was sampled and clean released.
216-BY-201	200 East Flush Tank - north of BY Tank Farm
216-TY-201	200 West Flush Tank - east of TY Tank Farm
231-W-151-001	200 West Vault/Tank - settling, out of service 1974
231-W-151-002	200 West Vault/Tank - settling, out of service 1974
241-A-302B	200 East Catch Tank - out of service 1980 (isolated 9/85 and stabilized 1990), monitored by leak detection
241-AX-151	200 East Diverter Station with several tanks inside, outside Tank Farm A - individual tanks will have separate entries
241-B-103	200 East Single-Shell Tank Farm B
241-B-104	200 East Single-Shell Tank Farm B
241-B-105	200 East Single-Shell Tank Farm B
241-B-106	200 East Single-Shell Tank Farm B
241-B-107	200 East Single-Shell Tank Farm B
241-B-108	200 East Single-Shell Tank Farm B
241-B-109	200 East Single-Shell Tank Farm B
241-B-110	200 East Single-Shell Tank Farm B
241-B-111	200 East Single-Shell Tank Farm B
241-B-112	200 East Single-Shell Tank Farm B
241-B-201	200 East Single-Shell Tank Farm B
241-B-202	200 East Single-Shell Tank Farm B
241-B-203	200 East Single-Shell Tank Farm B
241-B-204	200 East Single-Shell Tank Farm B
241-B-301	200 East Catch Tank - out of service 1984 and isolated
241-B-302B	200 East Catch Tank - out of service 1985 (May 6, 1985 interim stabilized and isolated)
241-BX-101	200 East Single-Shell Tank Farm BX
241-BX-102	200 East Single-Shell Tank Farm BX
241-BX-103	200 East Single-Shell Tank Farm BX
241-BX-104	200 East Single-Shell Tank Farm BX

Table B-1. Tank Farm Transition Project Units Emitting or Having the Potential to Emit Hazardous and/or Radioactive Gases. (7 Sheets)

Stack Number or Emission Point	Facility
241-BX-105	200 East Single-Shell Tank Farm BX
241-BX-106	200 East Single-Shell Tank Farm BX
241-BX-107	200 East Single-Shell Tank Farm BX
241-BX-108	200 East Single-Shell Tank Farm BX
241-BX-109	200 East Single-Shell Tank Farm BX
241-BX-110	200 East Single-Shell Tank Farm BX
241-BX-111	200 East Single-Shell Tank Farm BX
241-BX-112	200 East Single-Shell Tank Farm BX
241-BX-302A	200 East Catch Tank - out of service 1985 (isolated and stabilized)
241-BX-302B	200 East Catch Tank - out of service 1985 (isolated and stabilized 1985)
241-BX-302C	200 East Catch Tank - out of service 1985 (isolated and stabilized)
241-BY-101	200 East Single-Shell Tank Farm BY
241-BY-102	200 East Single-Shell Tank Farm BY
241-BY-103	200 East Single-Shell Tank Farm BY
241-BY-104	200 East Single-Shell Tank Farm BY
241-BY-105	200 East Single-Shell Tank Farm BY
241-BY-106	200 East Single-Shell Tank Farm BY
241-BY-107	200 East Single-Shell Tank Farm BY
241-BY-108	200 East Single-Shell Tank Farm BY
241-BY-109	200 East Single-Shell Tank Farm BY
241-BY-110	200 East Single-Shell Tank Farm BY
241-C-101	200 East Single-Shell Tank Farm C
241-C-102	200 East Single-Shell Tank Farm C
241-C-103	200 East Single-Shell Tank Farm C
241-C-104	200 East Single-Shell Tank Farm C
241-C-105	200 East Single-Shell Tank Farm C
241-C-106	200 East Single-Shell Tank Farm C
241-C-107	200 East Single-Shell Tank Farm C
241-C-108	200 East Single-Shell Tank Farm C
241-C-109	200 East Single-Shell Tank Farm C
241-C-110	200 East Single-Shell Tank Farm C
241-C-111	200 East Single-Shell Tank Farm C
241-C-112	200 East Single-Shell Tank Farm C
241-C-201	200 East Single-Shell Tank Farm C
241-C-202	200 East Single-Shell Tank Farm C
241-C-203	200 East Single-Shell Tank Farm C
241-C-204	200 East Single-Shell Tank Farm C

Table B-1. Tank Farm Transition Project Units Emitting or Having the Potential to Emit Hazardous and/or Radioactive Gases. (7 Sheets)

Stack Number or Emission Point	Facility
241-C-301	200 East Catch Tank - out of service 1983 (isolated), monitored by leak detector
241-ER-311	200 East Catch Tank - Southwest of B Plant
241-S-101	200 West Single-Shell Tank Farm S
241-S-102	200 West Single-Shell Tank Farm S
241-S-103	200 West Single-Shell Tank Farm S
241-S-104	200 West Single-Shell Tank Farm S
241-S-105	200 West Single-Shell Tank Farm S
241-S-106	200 West Single-Shell Tank Farm S
241-S-107	200 West Single-Shell Tank Farm S
241-S-108	200 West Single-Shell Tank Farm S
241-S-109	200 West Single-Shell Tank Farm S
241-S-110	200 West Single-Shell Tank Farm S
241-S-111	200 West Single-Shell Tank Farm S
241-S-112	200 West Single-Shell Tank Farm S
241-S-302A	200 West Catch Tank - out of service 1991 (isolated)
241-S-302B	200 West Catch Tank - out of service 1985 (isolated and stabilized)
241-SX-101	200 West Single-Shell Tank Farm SX
241-SX-102	200 West Single-Shell Tank Farm SX
241-SX-103	200 West Single-Shell Tank Farm SX
241-SX-104	200 West Single-Shell Tank Farm SX
241-SX-105	200 West Single-Shell Tank Farm SX
241-SX-106	200 West Single-Shell Tank Farm SX
241-SX-107	200 West Single-Shell Tank Farm SX
241-SX-108	200 West Single-Shell Tank Farm SX
241-SX-109	200 West Single-Shell Tank Farm SX
241-SX-110	200 West Single-Shell Tank Farm SX
241-SX-111	200 West Single-Shell Tank Farm SX
241-SX-112	200 West Single-Shell Tank Farm SX
241-SX-113	200 West Single-Shell Tank Farm SX
241-SX-114	200 West Single-Shell Tank Farm SX
241-SX-115	200 West Single-Shell Tank Farm SX
241-SX-302	200 West Catch Tank - out of service 1983 (isolated and stabilized 1984)
241-T-101	200 West Single-Shell Tank Farm T
241-T-102	200 West Single-Shell Tank Farm T
241-T-103	200 West Single-Shell Tank Farm T
241-T-104	200 West Single-Shell Tank Farm T
241-T-105	200 West Single-Shell Tank Farm T

Table B-1. Tank Farm Transition Project Units Emitting or Having the Potential to Emit Hazardous and/or Radioactive Gases. (7 Sheets)

Stack Number or Emission Point	Facility
241-T-106	200 West Single-Shell Tank Farm T
241-T-107	200 West Single-Shell Tank Farm T
241-T-108	200 West Single-Shell Tank Farm T
241-T-109	200 West Single-Shell Tank Farm T
241-T-110	200 West Single-Shell Tank Farm T
241-T-111	200 West Single-Shell Tank Farm T
241-T-112	200 West Single-Shell Tank Farm T
241-T-201	200 West Single-Shell Tank Farm T
241-T-202	200 West Single-Shell Tank Farm T
241-T-203	200 West Single-Shell Tank Farm T
241-T-204	200 West Single-Shell Tank Farm T
241-T-301B	200 West Catch Tank - out of service 1985 (isolated and stabilized July 1985)
241-TX-101	200 West Single-Shell Tank Farm TX
241-TX-102	200 West Single-Shell Tank Farm TX
241-TX-103	200 West Single-Shell Tank Farm TX
241-TX-104	200 West Single-Shell Tank Farm TX
241-TX-105	200 West Single-Shell Tank Farm TX
241-TX-106	200 West Single-Shell Tank Farm TX
241-TX-107	200 West Single-Shell Tank Farm TX
241-TX-108	200 West Single-Shell Tank Farm TX
241-TX-109	200 West Single-Shell Tank Farm TX
241-TX-110	200 West Single-Shell Tank Farm TX
241-TX-111	200 West Single-Shell Tank Farm TX
241-TX-112	200 West Single-Shell Tank Farm TX
241-TX-113	200 West Single-Shell Tank Farm TX
241-TX-114	200 West Single-Shell Tank Farm TX
241-TX-115	200 West Single-Shell Tank Farm TX
241-TX-116	200 West Single-Shell Tank Farm TX
241-TX-117	200 West Single-Shell Tank Farm TX
241-TX-118	200 West Single-Shell Tank Farm TX
241-TX-302A	200 West Catch Tank - out of service 1982 (isolated and stabilized 1984)
241-TX-302B	200 West Catch Tank - (isolated and stabilized in 1954); monitored by leak detector
241-TX-302BR	200 West Catch Tank - out of service 1954 (isolated in 1954) Contents unknown
241-TX-302XB	200 West Catch Tank - out of service 1985 (isolated and stabilized June 1985)
241-TY-101	200 West Single-Shell Tank Farm TY
241-TY-102	200 West Single-Shell Tank Farm TY
241-TY-103	200 West Single-Shell Tank Farm TY

Table B-1. Tank Farm Transition Project Units Emitting or Having the Potential to Emit Hazardous and/or Radioactive Gases. (7 Sheets)

Stack Number or Emission Point	Facility
241-TY-104	200 West Single-Shell Tank Farm TY
241-TY-105	200 West Single-Shell Tank Farm TY
241-TY-106	200 West Single-Shell Tank Farm TY
241-TY-107	200 West Single-Shell Tank Farm TY
241-TY-302A	200 West Catch Tank - out of service 1981 (isolated and stabilized June 1985)
241-TY-302B	200 West Catch Tank - out of service 1981 (isolated and stabilized)
241-U-101	200 West Single-Shell Tank Farm U
241-U-102	200 West Single-Shell Tank Farm U
241-U-103	200 West Single-Shell Tank Farm U
241-U-104	200 West Single-Shell Tank Farm U
241-U-105	200 West Single-Shell Tank Farm U
241-U-106	200 West Single-Shell Tank Farm U
241-U-107	200 West Single-Shell Tank Farm U
241-U-108	200 West Single-Shell Tank Farm U
241-U-109	200 West Single-Shell Tank Farm U
241-U-110	200 West Single-Shell Tank Farm U
241-U-111	200 West Single-Shell Tank Farm U
241-U-112	200 West Single-Shell Tank Farm U
241-U-201	200 West Single-Shell Tank Farm U
241-U-202	200 West Single-Shell Tank Farm U
241-U-203	200 West Single-Shell Tank Farm U
241-U-204	200 West Single-Shell Tank Farm U
241-Z-8	200 West Settling Tank - out of service 1962 (isolated and stabilized), liquid removed
242-T-135	200 West Decontaminated Tank - Outside of 242-T Evaporator
242-TA-R1	200 West Receiver Tank for Z Plant, very hot radiologically
243S-TK-1	200 West Decontamination Tank - Can be added to IMUST list
244AR	Sludge Vault Storage and Processing
244-BXR-001	200 East Vault – Uranium recovery - out of service 1957 (isolated 1985)
244-BXR-002	200 East Vault – Uranium recovery - out of service 1957 (isolated 1985)
244-BXR-003	200 East Vault – Uranium recovery - out of service 1957 (isolated 1985), soft sludge in sump
244-BXR-011	200 East Vault – Uranium recovery - out of service 1957 soft sludge in sump
244-TXR-001	200 West Vault – Uranium recovery - out of service 1956; (accumulator tank stabilized in 1984 - questionable integrity) (isolated); minimum sludge in sump
244-TXR-002	200 West Vault – Uranium recovery - out of service 1956 (stabilized in 1984 and isolated)
244-TXR-003	200 West Vault – Uranium recovery - out of service 1956 (stabilized in 1984 and isolated); minimum sludge in sump
244-UR-001	200 West Vault – Uranium recovery - out of service 1957 (isolated and stabilized in 1985); liquid and sludge in sump

Table B-1. Tank Farm Transition Project Units Emitting or Having the Potential to Emit Hazardous and/or Radioactive Gases. (7 Sheets)

Stack Number or Emission Point	Facility
244-UR-002	200 West Vault – Uranium recovery - out of service 1957 (isolated and stabilized in 1985)
244-UR-003	200 West Vault – Uranium recovery - out of service 1957 or 1976 (isolated and stabilized in 1985); liquid and sludge in sump
244-UR-004	200 West Vault – Uranium recovery - out of service 1957 or 1976 (isolated and stabilized in 1985); minimum heel
2715EC	200 East Paint Shop
272AW	200 East Maintenance Shop
272S	Insulator Paint Shop (200 West area)
272WA	200 West Maintenance Shop
277W	Sheet Metal Boiler Shop
296-A-12[1]	244-AR Vessel Vent
296-A-13[2]	244-AR Cell & Canyon Exhauster
296-A-17[1]	241-AY/AZ Tank Farms Exhauster
296-A-18[2]	241-AY-101 Tank Annulus Exhauster
296-A-19[2]	241-AY-102 Tank Annulus Exhauster
296-A-20[2]	241-AZ Tank Farm Annulus Exhauster
296-A-21[2]	242-A Evaporator Building Ventilation
296-A-22[1]	242-A Evaporator Vessel Ventilation
296-A-25[2]	244-A Double Contained Receiver Tank Exhauster
296-A-26[2]	204-AR Railcar Unloading Facility Exhauster
296-A-27[2]	241-AW Tank Farms Exhauster
296-A-28[2]	241-AW Tank Annulus Exhauster
296-A-29[2]	241-AN Tank Farm Exhauster
296-A-30[2]	241-AN Tank Annulus Exhauster
296-A-40[1]	241-AP Tank Farm Exhauster
296-A-41[1]	241-AP Tank Annulus Exhauster
296-B-28[1]	244-BX Double Contained Receiver Tank Exhauster
296-C-5[1]	244-CR Vault Exhauster
296-C-07[2]	103-C Vapor Mixer Stack
296-P-16[1]	241-C-105/106 Tank Exhauster
296-P-22[2]	241-SY Tank Annulus Exhauster
296-P-23[2]	241-SY Tank Farm Exhauster
296-P-26[1]	241-AY/AZ Tank Farms Backup Exhauster
296-P-28[2]	241-SY Tank Farm Backup Exhauster
296-P-31[2]	209-E Building Exhauster
296-P-32[1]	Rotary Mode Core Sampling Truck Exhauster
296-P-33[1]	Rotary Mode Core Sampling Truck Exhauster

Table B-1. Tank Farm Transition Project Units Emitting or Having the Potential to Emit Hazardous and/or Radioactive Gases. (7 Sheets)

Stack Number or Emission Point	Facility
296-S-15[1]	241-SX Tank Farm Exhauster
296-S-18[2]	242-S Evaporator Building Ventilation
296-S-22[1]	244-S Double Contained Receiver Tank Exhauster
296-S-25[1]	241-SY Tank Farm Replacement Exhauster
296-T-17[2]	242-T Evaporator Building Ventilation
296-T-18[1]	244-TX Double Contained Receiver Tank Exhauster
296-U-11[1]	244-U Double Contained Receiver Tank Exhauster
296-W-03[2]	213-W Waste Compactor

[1] Major stack for radionuclides.

[2] Minor stack for radionuclides.

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APPENDIX C

CONSTITUENTS OF POTENTIAL CONCERN

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APPENDIX C

CONSTITUENTS OF POTENTIAL CONCERN

Table C-1. Regulated Organic Constituents of Potential Concern as Applicable to the Regulatory Drivers (309 Compounds). (10 Sheets)

CAS #	Constituent	WAC 173-401[1] Threshold tons/yr	WAC 173-460[2] TAPs A and B		Action Limit based on 1,000 cfm mg/m^3
			TAP 10-6 Risk ASIL ug/m^3 annual average	TAP ASIL ug/m^3 24-hr average	
100-00-5	p-Nitrochlorobenzene			2	2.6
100-02-7	4-Nitrophenol	0.5	N/A	N/A	2.6
100-37-8	Diethylaminoethanol			170	346.8
100-41-4	Ethyl benzene	0.5		1000	667
100-42-5	Styrene	0.5		1000	667
100-61-8	N-Methylbenzenamine			7.3	2.6
100-63-0	Phenylhydrazine			1.5	2.6
100-74-3	N-Ethylmorpholine			77	160
101-84-8	Diphenyl ether			23	26.6
101-90-6	Diglycidyl resorcinol ether		N/A	N/A	
102-81-8	2-N-Dibutylaminoethanol			47	80
105-46-4	sec-Butyl acetate			3200	667
106-35-4	3-Heptanone			780	667
106-44-5	4-Methylphenol	0.5			
106-46-7	1,4-Dichlorobenzene	0.5	1.5		
106-50-3	p-Phenylenediamine	0.5		0.33	2.6
106-87-6	Vinyl cyclohexene dioxide			200	346.8
106-88-7	1,2-Epoxybutane	0.5		20	26.6
106-92-3	Allyl glycidyl ether			77	160
106-93-4	Ethylene dibromide	0.05	0.0045		
106-97-8	Butane			6300	
106-99-0	1,3-Butadiene	0.035	0.0036		
107-02-8	Acrolein	0.04		0.02	2.6
107-05-1	3-Chloropropene	0.5		1	2.6
107-06-2	1,2-Dichloroethane	0.4	0.038		
107-07-3	Ethylene chlorohydrin			11	26.6
107-13-1	Acrylonitrile	0.15	0.015		
107-15-3	Ethylene diamine			83	160
107-18-6	2-Propen-1-ol			17	26.6
107-21-1	Ethylene glycol	0.5		420	667

Table C-1. Regulated Organic Constituents of Potential Concern as Applicable to the Regulatory Drivers (309 Compounds). (10 Sheets)

CAS #	Constituent	WAC 173-401[1] Threshold tons/yr	WAC 173-460[2] TAPs A and B		Action Limit based on 1,000 cfm mg/m^3
			TAP 10-6 Risk ASIL ug/m^3 annual average	TAP ASIL ug/m^3 24-hr average	
107-31-3	Formic acid, methyl ester			820	667
107-87-9	2-Pentanone			2300	667
107-98-2	Propylene glycol monomethyl ether			2000	667
108-03-2	1-Nitropropane			20	26.6
108-05-4	Acetic acid vinyl ester	0.5		200	346.8
108-10-1	4-Methyl-2-pentanone (MIBK)	0.5		680	667
108-11-2	Methyl isobutyl carbinol			350	667
108-18-9	Diisopropylamine			67	160
108-20-3	Bis(isopropyl) ether			3500	667
108-21-4	Isopropyl acetate			3500	667
108-39-4	m-Cresol	0.5			
108-43-0	Chlorophenols		0.18		
108-83-8	Diisobutyl ketone			480	667
108-84-9	sec-Hexyl acetate			980	667
108-87-2	Methylcyclohexane			5400	667
108-88-3	Toluene	0.5		400	667
108-90-7	Chlorobenzene	0.5		150	346.8
108-91-8	Cyclohexylamine			140	346.8
108-93-0	Cyclohexanol			690	667
108-94-1	Cyclohexanone			330	667
108-95-2	Phenol	0.1		63	160
109-59-1	Isopropoxyethanol			350	667
109-60-4	n-Propyl acetate			2800	667
109-66-0	n-Pentane			6000	
109-73-9	n-Butylamine			50	80
109-79-5	n-Butyl mercaptan			6	2.6
109-86-4	2-Methoxyethanol	0.5		20	26.6
109-89-7	Diethylamine			100	266.8
109-94-4	Ethyl formate			1000	667
109-99-9	Tetrahydrofuran			2000	667
110-12-3	5-Methyl-2-hexanone			780	667
110-19-0	Isobutyl acetate			2400	667
110-43-0	2-Heptanone			780	667

Table C-1. Regulated Organic Constituents of Potential Concern as Applicable to the Regulatory Drivers (309 Compounds). (10 Sheets)

CAS #	Constituent	WAC 173-401[1] Threshold tons/yr	WAC 173-460[2] TAPs A and B		Action Limit based on 1,000 cfm mg/m^3
			TAP 10-6 Risk ASIL ug/m^3 annual average	TAP ASIL ug/m^3 24-hr average	
110-49-6	2-Methoxyethyl acetate			80	160
110-54-3	n-Hexane	0.5			
110-62-3	n-Valeraldehyde			590	667
110-82-7	Cyclohexane			3400	667
110-83-8	Cyclohexene			3400	667
110-86-1	Pyridine			53	80
111-15-9	2-Ethoxyethyl acetate			90	160
111-40-0	Diethylene triamine			14	26.6
111-42-2	Diethanolamine	0.5		43	80
111-44-4	Bis(2-chloroethyl) ether	0.03	0.003		
111-65-9	n-Octane			4700	667
111-76-2	2-Butoxyethanol	0.5		400	667
111-84-2	n-Nonane			3500	667
117-81-7	Bis(2-ethylhexyl) phthalate	0.5	2.5		
118-74-1	Hexachlorobenzene	0.005	0.0022		
120-82-1	1,2,4-Trichlorobenzene	0.5		120	266.8
121-45-9	Trimethyl phosphite			33	80
121-69-7	Dimethylaniline	0.5		83	160
122-39-4	N,N-Diphenylamine			33	2.6
122-60-1	Phenyl glycidyl ether			2000	667
123-19-3	4-Heptanone			780	667
123-31-9	Hydroquinone	0.5		6.7	2.6
123-38-6	n-Propionaldehyde	0.5	N/A	N/A	2.6
123-42-2	Diacetone alcohol			790	667
123-51-3	3-Methyl-1-butanol			1200	667
123-86-4	Acetic acid n-butyl ester			2400	667
123-91-1	1,4-Dioxan	0.5	0.032		
123-92-2	Isoamyl acetate			1700	667
124-40-3	Dimethylamine			60	160
126-73-8	Tributyl phosphate			7.3	2.6
126-98-7	2-Methyl-2-propenenitrile			9	2.6
127-18-4	1,1,2,2-Tetrachloroethene	0.5	1.1		
127-19-5	N,N-Dimethylacetamide			120	266.8

Table C-1. Regulated Organic Constituents of Potential Concern as Applicable to the Regulatory Drivers (309 Compounds). (10 Sheets)

CAS #	Constituent	WAC 173-401[1] Threshold tons/yr	WAC 173-460[2] TAPs A and B		Action Limit based on 1,000 cfm mg/m^3
			TAP 10-6 Risk ASIL ug/m^3 annual average	TAP ASIL ug/m^3 24-hr average	
128-37-0	2,6-Bis(tert-butyl)-4-methylphenol			33	80
131-11-3	Dimethyl phthalate	0.5		17	26.6
1321-64-8	Pentachloronaphthalene			1.7	2.6
1321-65-9	Trichloronaphthalene			17	26.6
133-06-2	Captan	0.5		17	26.6
1335-87-1	Hexachloronaphthalene			0.67	2.6
1335-88-2	Tetrachloronaphthalene			6.7	2.6
1336-36-3	Polychlorinated biphenyls (PCBs)	0.0045	0.0045		
1338-23-4	Methyl ethyl ketone peroxide			5	2.6
133-90-4	Chloramben	0.5	N/A	N/A	2.6
134-32-7	alpha-Naphthylamine		N/A	N/A	
135-20-6	Cupferron		N/A	N/A	
137-05-3	Methyl-2-cyanoacrylate			30	80
138-22-7	n-Butyl lactate			83	160
139-65-1	4,4'-Thiodianiline		N/A	N/A	
140-88-5	Ethylacrylate	0.5		66	160
141-32-2	Butylacrylate			170	346.8
141-43-5	Ethanolamine			25	26.6
141-78-6	Acetic acid ethyl ester			4800	667
141-79-7	4-Methyl-3-penten-2-one			200	346.8
142-82-5	n-Heptane			5500	667
144-62-7	Oxalic acid			3.3	2.6
148-01-6	Dinitolamide			17	26.6
150-76-5	4-Methoxyphenol			17	26.6
16219-75-3	Ethylidene norbornene			83	160
1634-04-4	Methyl tert-butyl ether	0.5		500	667
1746-01-6	TCDD	0.0000003	0.00000003		
1836-75-5	Nitrofen		N/A	N/A	
189-55-9	Dibenzo[a,i]pyrene	0.005	N/A	N/A	
189-64-0	Dibenzo[a,h]pyrene		N/A	N/A	
191-30-0	Dibenzo(a,l)pyrene		N/A	N/A	
1918-02-1	Picloram			33	80
192-65-4	Dibenzo[a,e]pyrene		N/A	N/A	

Table C-1. Regulated Organic Constituents of Potential Concern as Applicable to the Regulatory Drivers (309 Compounds). (10 Sheets)

CAS #	Constituent	WAC 173-401[1] Threshold tons/yr	WAC 173-460[2] TAPs A and B		Action Limit based on 1,000 cfm mg/m^3
			TAP 10-6 Risk ASIL ug/m^3 annual average	TAP ASIL ug/m^3 24-hr average	
2039-87-4	o-Chlorostyrene			940	667
2234-13-1	Octachloronaphthalene			0.33	2.6
2238-07-5	Diglycidyl ether			1.7	2.6
224-42-0	Dibenz[a,j]acridine		N/A	N/A	
226-36-8	Dibenz[a,h]acridine		N/A	N/A	
2425-06-1	Captafol			0.33	2.6
25013-15-4	Vinyl toluene			800	667
2551-13-7	Trimethyl benzene			420	667
25639-42-3	Methylcyclohexanol			780	667
26140-60-3	Terphenyls			16	26.6
26952-21-6	Iso-ocytl alcohol			890	667
26952-23-8	Dichloropropene			20	
2698-41-1	o-Chlorobenylidene malonitrile			1.3	2.6
287-92-3	Cyclopentane			5700	667
2921-88-2	Chlorpyrifos			0.67	2.6
302-01-2	Hydrazine	0.002	0.0002		
3068-88-0	B-Butyrolactone		N/A	N/A	
314-40-9	Bromacil			33	80
319-84-6	alpha-BHC			1.7	
319-85-7	beta-BHC			1.7	
3333-52-6	Tetramethyl succinonitrile			9.3	2.6
34590-94-8	Dipropylene glycol methyl ether			2000	667
3697-24-3	5-Methylchrysene		N/A	N/A	
3825-26-1	Ammonium perfluorooctanoate			0.33	2.6
4016-14-2	Isopropyl glycidyl ether (IGE)			790	667
4098-71-9	Isophorone diisocyanate			0.15	2.6
4170-30-3	2-Butenaldehyde			20	26.6
420-04-2	Cyanamide			6.7	2.6
50-00-0	Formaldehyde	0.5	0.077		
504-29-0	2-Aminopyridine			6.3	2.6
5124-30-1	Methylene-bis-(4-cyclo-hexylisocyanate)			0.18	2.6
51-28-5	2,4-Dinitrophenol	0.5	N/A	N/A	2.6

Table C-1. Regulated Organic Constituents of Potential Concern as Applicable to the Regulatory Drivers (309 Compounds). (10 Sheets)

CAS #	Constituent	WAC 173-401[1] Threshold tons/yr	WAC 173-460[2] TAPs A and B		Action Limit based on 1,000 cfm mg/m^3
			TAP 10-6 Risk ASIL ug/m^3 annual average	TAP ASIL ug/m^3 24-hr average	
531-82-8	N-(4-(5-Nitro-2-furyl)-2-thiazolyl)acetamide		N/A	N/A	
540-59-0	1,2-Dichloroethylene			2600	667
540-84-1	2,2,4-Trimethylpentane	0.5	N/A	N/A	2.6
540-88-5	tert-Butyl acetate			3200	667
541-85-5	Ethyl amyl ketone			440	667
542-75-6	1,3-Dichloropropene	0.5			26.6
542-92-7	Cyclopentadiene			680	667
556-52-5	Glycidol			250	346.8
55738-54-0	trans-2((Dimethylamino) methylimino)-5-(2-(5-nitro-2-furyl) vinyl-1,3,4-oxadiazole		N/A	N/A	
56-23-5	Carbon tetrachloride	0.5	0.067		
563-80-4	3-Methyl-2-butanone			2300	667
57-14-7	1,1-Dimethylhydrazine	0.004		4	2.6
57-57-8	B-Propiolactone	0.1		5	2.6
583-60-8	o-Methylcyclohexanone			760	667
584-84-9	2,4-Toluene diisocyanate	0.05		0.12	
58-89-9	gamma-BHC (Lindane)	0.005	0.0026		
591-78-6	2-Hexanone			67	160
592-62-1	Methyl azoxymethyl acetate		N/A	N/A	
593-60-2	Vinyl bromide	0.5		73	160
594-42-3	Perchloromethyl mercaptan			2.5	2.6
594-72-9	1,1-Dichloro-1-nitroethane			40	80
59-89-2	N-Nitrosomorpholine	0.05	N/A	N/A	
600-25-9	1-Chloro-1-nitropropane			33	80
602-87-9	5-Nitroacenaphthene		N/A	N/A	
60-29-7	Ethyl ether			4000	
603-34-9	Triphenyl amine			17	26.6
60-34-4	Methylhydrazine	0.03		1.2	2.6
60-35-5	Acetamide	0.5	N/A	N/A	2.6
624-83-9	Methyl isocyanate	0.1		0.16	2.6
626-17-5	m-Phthalodinitrile			17	26.6
626-38-0	sec-Amyl acetate			2200	667

Table C-1. Regulated Organic Constituents of Potential Concern as Applicable to the Regulatory Drivers (309 Compounds). (10 Sheets)

CAS #	Constituent	WAC 173-401[1] Threshold tons/yr	WAC 173-460[2] TAPs A and B		Action Limit based on 1,000 cfm mg/m^3
			TAP 10-6 Risk ASIL ug/m^3 annual average	TAP ASIL ug/m^3 24-hr average	
627-13-4	Nitric acid, propyl ester			360	667
62-75-9	N-Nitroso-N,N-dimethylamine	0.0005	0.000071		
628-63-7	n-Amyl acetate			1800	667
628-96-6	Ethylene glycol dinitrate			1	2.6
64091-91-4	4-(Methylnitrosamino)-1-(3-pyridyl)-1-butanone		N/A	N/A	
64-17-5	Ethyl alcohol			6300	
64-18-6	Formic acid			31	80
64-19-7	Acetic acid			83	160
64-67-5	Diethyl sulfate	0.5	N/A	N/A	2.6
67-56-1	Methyl alcohol	0.5		870	667
67-63-0	2-Propyl alcohol			3300	667
67-64-1	2-Propanone (Acetone)			5900	667
67-66-3	Chloroform	0.45	0.043		
67-72-1	Hexachloroethane	0.5		32	80
68-11-1	Thioglycolic acid			13	26.6
68-12-2	Dimethylformamide	0.5		30	80
681-84-5	Methyl silicate			20	26.6
684-16-2	Hexafluoroacetone			2.3	2.6
71-23-8	n-Propyl alcohol			1600	667
71-36-3	n-Butanol			500	667
71-43-2	Benzene	0.5	0.12		
71-55-6	1,1,1-Trichloroethane	0.5		6400	
74-83-9	Bromomethane	0.5		5	2.6
74-87-3	Chloromethane	0.5		340	667
74-89-5	Methylamine			43	80
74-96-4	Ethyl bromide			3000	667
74-97-5	Bromochloromethane			3500	667
74-99-7	Methylacetylene			5500	667
75-00-3	Chloroethane	0.5		10000	
75-01-4	1-Chloroethene	0.1	0.012		
75-04-7	Ethylamine			60	160
75-05-8	Acetonitrile	0.5		220	346.8

Table C-1. Regulated Organic Constituents of Potential Concern as Applicable to the Regulatory Drivers (309 Compounds). (10 Sheets)

CAS #	Constituent	WAC 173-401[1] Threshold tons/yr	WAC 173-460[2] TAPs A and B		Action Limit based on 1,000 cfm mg/m^3
			TAP 10-6 Risk ASIL ug/m^3 annual average	TAP ASIL ug/m^3 24-hr average	
75-07-0	Acetaldehyde	0.5	0.45		
75-08-1	Ethyl mercaptan			4.3	2.6
75-09-2	Dichloromethane (Methylene Chloride)	0.5	0.56		
75-12-7	Formamide			60	160
75-15-0	Carbon disulfide	0.5		100	266.8
75-21-8	Oxirane	0.1	0.01		
75-25-2	Tribromomethane	0.5	0.91		
75-31-0	Isopropylamine			40	80
75-34-3	1,1-Dichloroethane	0.003		2700	667
75-35-4	1,1-Dichloroethene	0.2		67	160
75-43-4	Dichlorofluoromethane			130	346.8
75-45-6	Chlorodifluoromethane			12000	
75-50-3	Trimethylamine			80	160
75-52-5	Nitromethane			830	667
75-55-8	2-Methylaziridine	0.5		16	26.6
75-56-9	Propylene oxide	0.5	0.27		
75-61-6	Difluorodibromomethane			2900	667
75-63-8	Trifluorobromomethane			20000	
75-65-0	2-Methyl-2-propanol			1000	667
75-69-4	Trichlorofluoromethane			19000	
75-71-8	Dichlorodifluoromethane			16000	
7572-29-4	Dichloroacetylene			1.3	2.6
76-03-9	Trichloroacetic acid			22	26.6
76-11-9	1,1,1,2-Tetrachloro-2,2-difluoroethane			14000	667
76-12-0	1,1,2,2-Tetrachloro-1,2-difluoroethane			14000	667
76-13-1	1,2,2-Trichlorotrifluoroethane (Freon 113)			27000	667
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane			23000	
76-15-3	Chloropentafluoroethane			21000	
768-52-5	N-Isopropylaniline			37	80
77-47-4	Hexachlorocyclopentadiene	0.1		0.33	2.6

Table C-1. Regulated Organic Constituents of Potential Concern as Applicable to the Regulatory Drivers (309 Compounds). (10 Sheets)

CAS #	Constituent	WAC 173-401[1] Threshold tons/yr	WAC 173-460[2] TAPs A and B		Action Limit based on 1,000 cfm mg/m^3
			TAP 10-6 Risk ASIL ug/m^3 annual average	TAP ASIL ug/m^3 24-hr average	
77-73-6	Dicyclopentadiene			100	266.8
78-10-4	Ethyl silicate			280	667
78-59-1	Isophorone	0.5		93	160
78-83-1	2-Methylpropyl alcohol			510	667
78-87-5	1,2-Dichloropropane	0.5		4	
78-92-2	1-Methylpropyl alcohol			1000	667
78-93-3	2-Butanone (Methyl ethyl ketone)	0.5		1000	667
79-00-5	1,1,2-Trichloroethane	0.5		180	346.8
79-01-6	1,1,2-Trichloroethylene	0.5	0.59		
79-04-9	Chloroacetyl chloride			0.67	2.6
79-09-4	Propanoic acid			100	266.8
79-10-7	2-Propenoic acid	0.5		0.3	2.6
79-11-8	Chloroacetic acid	0.1	N/A	N/A	2.6
79-20-9	Methyl acetate			2000	667
79-24-3	Nitroethane			1000	667
79-27-6	Acetylene tetrabromide			47	80
79-34-5	1,1,2,2-Tetrachloroethane	0.15		23	26.6
79-41-4	Methacrylic acid			230	346.8
8003-34-7	Pyrethrum			1.7	2.6
822-06-0	Hexamethylene diisocyanate	0.02		0.11	
82-68-8	Pentachloronitrobenzene (PCNB)	0.15		1.7	2.6
84-66-2	Diethyl phthalate			17	26.6
84-74-2	Di-n-butylphthalate	0.5		17	26.6
87-68-3	Hexachlorobutadiene	0.5		0.7	2.6
87-86-5	Pentachlorophenol	0.35	0.33		
88-06-2	2,4,6-Trichlorophenol	0.5	0.32		
88-72-2	Nitrotoluene			37	80
88-89-1	Picric acid			0.33	2.6
89-72-5	o-sec-Butylphenol			100	266.8
91-20-3	Naphthalene	0.5		170	346.8
91-22-5	Quinoline	0.003	N/A	N/A	2.6
92-52-4	1,1`-Biphenyl	0.5		4.3	2.6
92-93-3	4-Nitrobiphenyl	0.5	N/A	N/A	2.6

Table C-1. Regulated Organic Constituents of Potential Concern as Applicable to the Regulatory Drivers (309 Compounds). (10 Sheets)

CAS #	Constituent	WAC 173-401[1] Threshold tons/yr	WAC 173-460[2] TAPs A and B		Action Limit based on 1,000 cfm mg/m^3
			TAP 10-6 Risk ASIL ug/m^3 annual average	TAP ASIL ug/m^3 24-hr average	
93-76-5	2,4,5-T		N/A	N/A	80
94-75-7	2,4-D	0.5		33	
95-13-6	Indene			160	346.8
95-48-7	o-Cresol	0.5			
95-49-8	o-Chlorotoluene			860	667
95-50-1	1,2-Dichlorobenzene			1000	667
95-95-4	2,4,5-Trichlorophenol	0.5	N/A	N/A	2.6
96-09-3	Styrene oxide	0.5	N/A	N/A	
96-12-8	1,2-Dibromo-3-chloropropane	0.004		0.2	2.6
96-22-0	3-Pentanone			2300	667
96-33-3	Methyl acrylate			120	266.8
96-69-5	Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl) sulfide			33	80
97-56-3	o-Aminoazotoluene		N/A	N/A	
98-00-0	Furfuryl alcohol			130	346.8
98-01-1	Furfural			26	26.6
98-51-1	p-tert-Butyltoluene			200	346.8
98-82-2	Cumene			820	667
98-82-8	(1-Methylethyl)benzene	0.5			667
98-83-9	Methylstyrene			810	667
98-86-2	Acetophenone	0.5	N/A	N/A	2.6
98-95-3	Nitrobenzene	0.5		1.7	2.6
999-61-1	2-Hydroxypropyl acrylate			9.3	2.6

[1] WAC 173-401, 1993, "Operating Permit Regulation," *Washington Administrative Code*, as amended.

[2] WAC 173-460, 1991, "Controls For New Sources Of Toxic Air Pollutants," *Washington Administrative Code*, as amended.

ASIL = acceptable source impact level.
N/A = Compound is a TAP, however no ASIL value is established for it.
TAP = toxic air pollutant.
WAC = *Washington Administrative Code*.

Table C-2. Regulated Parameters and Inorganic Constituents of Potential Concern (62 Compounds). (2 Sheets)

CAS #	Constituent	Action Limit based on 1,000 cfm mg/m^3
7429-90-5	Aluminum	
86954-36-1	Am-241	
7664-41-7	Ammonia	
7440-36-0	Antimony	2.6
7440-38-2	Arsenic	
7440-39-3	Barium	2.6
7440-41-7	Beryllium	
7440-69-9	Bismuth	
7440-42-8	Boron	
7726-95-6	Bromine	
7440-43-9	Cadmium	
7440-70-2	Calcium	
630-08-0	Carbon monoxide	
3812-32-6	Carbonate	
7782-50-5	Chlorine	
7440-47-3	Chromium	2.6
7440-48-4	Cobalt	
7440-50-8	Copper	2.6
10045-97-3	Cs-137	
57-12-5	Cyanide	
7782-41-4	Fluorine	
7553-56-2	Iodine	
7439-89-6	Iron	
7439-92-1	Lead	
7439-93-2	Lithium	
7439-95-4	Magnesium	
7439-96-5	Manganese	2.6
7439-97-6	Mercury	2.6
7439-98-7	Molybdenum	
7440-02-0	Nickel	
7697-37-2	Nitrate	
14797-65-0	Nitrite	
7727-37-9	Nitrogen	
10102-44-0	Nitrogen dioxide	
10028-15-6	Ozone	
PART	Particulates	
7723-14-0	Phosphorus	

Table C-2. Regulated Parameters and Inorganic Constituents of Potential Concern (62 Compounds). (2 Sheets)

CAS #	Constituent	Action Limit based on 1,000 cfm mg/m^3
7440-06-4	Platinum	
7440-09-7	Potassium	
I126	Pu-239	
R5	Pu-240	
7440-16-6	Rhodium	2.6
7782-49-2	Selenium	2.6
7440-21-3	Silicon	
7440-22-4	Silver	2.6
7440-23-5	Sodium	
10098-97-2	Sr-90	
14808-79-8	Sulfate	
63705-05-5	Sulfur	
7446-09-5	Sulfur dioxide	
7440-25-7	Tantalum	
7440-28-0	Thallium	
I205	Thiocyanate	
7440-29-1	Thorium	
7440-31-5	Tin	2.6
7440-32-6	Titanium	
7440-33-7	Tungsten	
7440-61-1	Uranium	2.6
7440-62-2	Vanadium	
7440-65-5	Yttrium	2.6
7440-66-6	Zinc	
7440-67-7	Zirconium	26.6

CAS # = chemical abstract services number.

ATTACHMENT I

DATABASE DOCUMENTATION FOR ANALYTE SELECTION

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ATTACHMENT I

DATABASE DOCUMENTATION FOR ANALYTE SELECTION

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Table Att-I-1. Consolidated Regulatory DQO Input List (702 Compounds). (20 Sheets)

CAS #	Constituent
100-00-5	p-Nitrochlorobenzene
100-01-6	4-Nitroaniline
100-02-7	4-Nitrophenol
100-37-8	Diethylaminoethanol
100-41-4	Ethyl benzene
100-42-5	Styrene
100-44-7	Benzyl chloride
100-61-8	N-Methylbenzenamine
100-63-0	Phenylhydrazine
100-74-3	N-Ethylmorpholine
10025-67-9	Sulfur monochloride
10025-73-7	Chromic chloride
10025-87-3	Phosphorus oxychloride
10026-13-8	Phosphorus pentachloride
10028-15-6	Ozone
10035-10-6	Hydrogen bromide
10045-94-0	Mercuric nitrate
10049-04-4	Chlorine dioxide
101-14-4	4,4'-Methylenebis(2-chloroaniline)
101-68-8	Methylene bis(phenyl isocyanate)
101-77-9	4,4-Methylene dianiline
101-80-4	4,4'-Diaminodiphenyl ether
101-84-8	Diphenyl ether
101-90-6	Diglycidyl resorcinol ether
10102-43-9	Nitric oxide
10102-44-0	Nitrogen dioxide
102-54-5	Dicyclopentadienyl iron
102-81-8	2-N-Dibutylaminoethanol
10210-68-1	Cobalt carbonyl as Co
10294-33-4	Boron tribromide
105-46-4	sec-Butyl acetate
105-60-2	Caprolactam, vapor
105-60-2a	Caprolactam, dust
10595-95-6	N-Nitrosomethylethylamine
106-35-4	3-Heptanone
106-44-5	4-Methylphenol

Table Att-I-1. Consolidated Regulatory DQO Input List (702 Compounds). (20 Sheets)

CAS #	Constituent
106-46-7	1,4-Dichlorobenzene
106-49-0	p-Toluidine
106-50-3	p-Phenylenediamine
106-51-4	p-Benzoquinone
106-87-6	Vinyl cyclohexene dioxide
106-88-7	1,2-Epoxybutane
106-89-8	Epichlorohydrin
106-92-3	Allyl glycidyl ether
106-93-4	Ethylene dibromide
106-97-8	Butane
106-99-0	1,3-Butadiene
107-02-8	Acrolein
107-05-1	3-Chloropropene
107-06-2	1,2-Dichloroethane
107-07-3	Ethylene chlorohydrin
107-13-1	Acrylonitrile
107-15-3	Ethylene diamine
107-18-6	2-Propen-1-ol
107-19-7	Propargyl alcohol
107-20-0	Chloroacetaldehyde
107-21-1	Ethylene glycol
107-30-2	Chloromethyl methyl ether
107-31-3	Formic acid, methyl ester
107-41-5	Hexylene glycol
107-49-3	Tetraethyl pyrophosphate
107-66-4	Dibutylphosphate
107-87-9	2-Pentanone
107-98-2	Propylene glycol monomethyl ether
108-03-2	1-Nitropropane
108-05-4	Acetic acid vinyl ester
108-10-1	4-Methyl-2-pentanone (MIBK)
108-11-2	Methyl isobutyl carbinol
108-18-9	Diisopropylamine
108-20-3	Bis(isopropyl) ether
108-21-4	Isopropyl acetate
108-24-7	Acetic anhydride

Table Att-I-1. Consolidated Regulatory DQO Input List (702 Compounds). (20 Sheets)

CAS #	Constituent
108-31-6	Maleic anhydride (2,5-Furandione)
108-39-4	m-Cresol
108-43-0	Chlorophenols
108-44-1	m-Toluidine
108-46-3	Resorcinol (1,3-Benzenediol)
108-83-8	Diisobutyl ketone
108-84-9	sec-Hexyl acetate
108-87-2	Methylcyclohexane
108-88-3	Toluene
108-90-7	Chlorobenzene
108-91-8	Cyclohexylamine
108-93-0	Cyclohexanol
108-94-1	Cyclohexanone
108-95-2	Phenol
108-98-5	Thiophenol
109-59-1	Isopropoxyethanol
109-60-4	n-Propyl acetate
109-66-0	n-Pentane
109-73-9	n-Butylamine
109-79-5	n-Butyl mercaptan
109-86-4	2-Methoxyethanol
109-87-5	Methylal
109-89-7	Diethylamine
109-94-4	Ethyl formate
109-99-9	Tetrahydrofuran
110-12-3	5-Methyl-2-hexanone
110-19-0	Isobutyl acetate
110-43-0	2-Heptanone
110-49-6	2-Methoxyethyl acetate
110-54-3	n-Hexane
110-54-3D	Hexane, other isomers
110-62-3	n-Valeraldehyde
110-80-5	2-Ethoxyethanol
110-82-7	Cyclohexane
110-83-8	Cyclohexene
110-86-1	Pyridine

Table Att-I-1. Consolidated Regulatory DQO Input List (702 Compounds). (20 Sheets)

CAS #	Constituent
110-91-8	Morpholine
111-15-9	2-Ethoxyethyl acetate
111-30-8	Glutaraldehyde
111-40-0	Diethylene triamine
111-42-2	Diethanolamine
111-44-4	Bis(2-chloroethyl) ether
111-46-6D	Glycol ethers
111-65-9	n-Octane
111-76-2	2-Butoxyethanol
111-84-2	n-Nonane
1120-71-4	1,3-Propane sultone
114-26-1	Propoxur
115-29-7	Endosulfan
115-86-6	Triphenyl phosphate
115-90-2	Fensulfothion
117-79-3	2-Aminoanthraquinone
117-81-7	Bis(2-ethylhexyl) phthalate
118-52-5	1,3-Dichloro-5,5-Dimethyl hydantoin
118-74-1	Hexachlorobenzene
118-96-7	2,4,6-Trinitrotoluene
1189-85-1	tert-Butyl chromate, as CrO3
119-90-4	3,3'-Dimethoxybenzidine
119-93-7	3,3'-Dimethylbenzidine.
120-80-9	Catechol
120-82-1	1,2,4-Trichlorobenzene
12035-72-2	Nickel refinery dust
12079-65-1	Manganese cyclopentadienyl tricarbonyl
121-14-2	2,4-Dinitrotoluene
121-44-8	Triethylamine
121-45-9	Trimethyl phosphite
121-69-7	Dimethylaniline
121-75-5	Malathion
121-82-4	Cyclonite
12108-13-3	Methylcyclopentadienylmanganese tricarbonyl
12125-02-9	Ammonium chloride (fume)
122-39-4	N,N-Diphenylamine

Table Att-I-1. Consolidated Regulatory DQO Input List (702 Compounds). (20 Sheets)

CAS #	Constituent
122-60-1	Phenyl glycidyl ether
122-66-7	1,2-Diphenylhydrazine
123-19-3	4-Heptanone
123-31-9	Hydroquinone
123-38-6	n-Propionaldehyde
123-42-2	Diacetone alcohol
123-51-3	3-Methyl-1-butanol
123-86-4	Acetic acid n-butyl ester
123-91-1	1,4-Dioxan
123-92-2	Isoamyl acetate
124-40-3	Dimethylamine
126-73-8	Tributyl phosphate
126-85-2	Nitrogen mustard N-oxide
126-98-7	2-Methyl-2-propenenitrile
126-99-8	Chloroprene
12604-58-9	Ferrovanadium dust
127-18-4	1,1,2,2-Tetrachloroethene
127-19-5	N,N-Dimethylacetamide
128-37-0	2,6-Bis(tert-butyl)-4-methylphenol
129-15-7	2-Methyl-1-nitroanthraquinone
1300-73-8	Xylidine
1303-86-2	Boron oxide
1303-96-4Ca	Borates, anhydrous
1303-96-4Cb	Borates, pentahydrate
1303-96-4Cc	Borates, decahydrate
1304-82-1	Bismuth telluride
1305-62-0	Calcium hydroxide
1305-78-8	Calcium oxide
1309-37-1	Iron oxide fume, Fe2O3 as Fe
1309-48-4	Magnesium oxide fume
1309-64-4	Antimony trioxide, as Sb
131-11-3	Dimethyl phthalate
1310-58-3	Potassium hydroxide
1310-73-2	Sodium hydroxide
13121-70-5	Cyhexatin
1314-13-2	Zinc oxide, fume

Table Att-I-1. Consolidated Regulatory DQO Input List (702 Compounds). (20 Sheets)

CAS #	Constituent
1314-20-1	Thorium dioxide
1314-62-1	Vanadium pentoxide
1314-80-3	Phosphorus pentasulfide
1319-77-3	Cresol polymers
132-64-9	Dibenzofuran
1321-64-8	Pentachloronaphthalene
1321-65-9	Trichloronaphthalene
1321-74-0	Divinyl benzene
133-06-2	Captan
133-90-4	Chloramben
1330-20-7	Xylene
1332-21-4	Asbestos (fiberous)
1333-86-4	Carbon black
1335-87-1	Hexachloronaphthalene
1335-88-2	Tetrachloronaphthalene
1336-36-3	Polychlorinated biphenyls (PCBs)
1338-23-4	Methyl ethyl ketone peroxide
134-32-7	alpha-Naphthylamine
13410-01-0	Sodium selenate
1345-04-6	Antimony trisulfide
13463-39-3	Nickel carbonyl
13463-40-6	Iron pentacarbonyl, as Fe
13494-80-9C	Tellurium & compounds as Te
135-20-6	Cupferron
13530-65-9	Zinc chromates
13552-44-8	4,4-Methylenedianiline dihydrochloride
136-78-7	Sesone
137-05-3	Methyl-2-cyanoacrylate
137-26-8	Thiram
138-22-7	n-Butyl lactate
13838-16-9	Enflurane
139-65-1	4,4'-Thiodianiline
139-91-3	5-(Morpholinomethyl)-3-amino-2-oxazolidinone (furaltudone)
1395-21-7	Subtilisins
140-88-5	Ethylacrylate
141-32-2	Butylacrylate

Table Att-I-1. Consolidated Regulatory DQO Input List (702 Compounds). (20 Sheets)

CAS #	Constituent
141-43-5	Ethanolamine
141-66-2	Dicrotophos
141-78-6	Acetic acid ethyl ester
141-79-7	4-Methyl-3-penten-2-one
142-64-3	Piperazine dihydrochloride
142-82-5	n-Heptane
143-33-9	Sodium cyanide
144-62-7	Oxalic acid
14484-64-1	Ferbam
1477-55-0	m-Xylene-a,a'-diamine
148-01-6	Dinitolamide
14977-61-8	Chromylchloride
150-76-5	4-Methoxyphenol
151-50-8	Potassium cyanide
151-56-4	Ethyleneimine
151-67-7	Halothane
156-62-7	Calcium cyanamide
1563-66-2	Carbofuran
1582-09-8	Trifluralin
1615-80-1	N,N'-Diethylhydrazine
16219-75-3	Ethylidene norbornene
1634-04-4	Methyl tert-butyl ether
16752-77-5	Methomyl
16842-03-8	Cobalt hydrocarbonyl
1694-09-3	Benzyl violet 4b
16984-48-8	Fluoride
1746-01-6	TCDD
17702-41-9	Decaborane
17804-35-2	Benomyl
1836-75-5	Nitrofen
189-55-9	Dibenzo[a,i]pyrene
189-64-0	Dibenzo[a,h]pyrene
191-30-0	Dibenzo(a,l)pyrene
1912-24-9	Atrazine
1918-02-1	Picloram
192-65-4	Dibenzo[a,e]pyrene

Table Att-I-1. Consolidated Regulatory DQO Input List (702 Compounds). (20 Sheets)

CAS #	Constituent
19287-45-7	Diborane
1929-82-4	Nitrapyrin
193-39-5	Indeno(1,2,3-cd)pyrene
19624-22-7	Pentaborane
2039-87-4	o-Chlorostyrene
205-82-3	Benzo[j]fluoranthene
205-99-2	Benzo(b)fluoranthene
207-08-9	Benzo(k)fluoranthene
20816-12-0	Osmium tetroxide
2095-58-1	Boron trifluoride
2104-64-5	EPN
21087-64-9	Metribuzin
21351-79-1	Cesium hydroxide
2179-59-1	Allyl propyl disulfide
218-01-9	Chrysene
22224-92-6	Fenamiphos
2234-13-1	Octachloronaphthalene
2238-07-5	Diglycidyl ether
224-42-0	Dibenz[a,j]acridine
226-36-8	Dibenz[a,h]acridine
2385-85-5	Mirex
2425-06-1	Captafol
2426-08-6	n-Butyl glycidyl ether
2465-27-2	Auramine (technical grade)
25013-15-4	Vinyl toluene
2551-13-7	Trimethyl benzene
2551-62-4	Sulfur hexafluoride
25639-42-3	Methylcyclohexanol
26140-60-3	Terphenyls
2646-17-5	Oil orange SS
26628-22-8	Sodium azide
26952-21-6	Iso-ocytl alcohol
26952-23-8	Dichloropropene
2698-41-1	o-Chlorobenylidene malonitrile
2699-79-8	Sulfuryl fluoride
28300-74-5	Antimony potassium tartrate

Table Att-I-1. Consolidated Regulatory DQO Input List (702 Compounds). (20 Sheets)

CAS #	Constituent
28434-86-8	3,3'-Dichloro-4,4'-diaminodiphenyl ether
287-92-3	Cyclopentane
29191-52-4	Anisidine (o-,p- isomers)
2921-88-2	Chlorpyrifos
2971-90-6	Clopidol
298-00-0	Methyl parathion
298-02-2	Phorate
298-04-4	Disulfoton
299-84-3	Ronnel
299-86-5	Crufomate
300-76-5	Naled
301-04-2	Lead acetate
302-01-2	Hydrazine
302-70-5	Nitrogen mustard N-oxide hydrochloride
3068-88-0	B-Butyrolactone
309-00-2	Aldrin
314-40-9	Bromacil
319-84-6	alpha-BHC
319-85-7	beta-BHC
330-54-1	Diuron
333-41-5	Diazinon
3333-52-6	Tetramethyl succinonitrile
334-88-3	Diazomethane
3383-96-8	Temephos
34590-94-8	Dipropylene glycol methyl ether
353-50-4	Carbon oxyfluoride
35400-43-2	Sulprofos
3547-04-4	DDE (p,p'-Dichlorodiphenyldichloroethylene)
3687-31-8	Lead arsenate, as Pb3 (A2O4)2
3689-24-5	Tetraethyldithiopyrophosphate (TEDP)
3697-24-3	5-Methylchrysene
3761-53-3	Ponceau MX
3825-26-1	Ammonium perfluorooctanoate
4016-14-2	Isopropyl glycidyl ether (IGE)
4098-71-9	Isophorone diisocyanate
4170-30-3	2-Butenaldehyde

Table Att-I-1. Consolidated Regulatory DQO Input List (702 Compounds). (20 Sheets)

CAS #	Constituent
420-04-2	Cyanamide
460-19-5	Cyanogen
463-51-4	Ketene
463-58-1	Carbon oxide sulfide (COS)
4685-14-7	Paraquat
479-45-8	Tetryl
50-00-0	Formaldehyde
50-29-3	4,4-DDT
50-32-8	Benzo(a)pyrene
504-29-0	2-Aminopyridine
506-77-4	Cyanogen chloride
509-14-8	Tetranitromethane
51-12-5	Cyanides, as CN
51-28-5	2,4-Dinitrophenol
51-79-6	Ethyl carbamate (urethane)
510-15-6	Chlorobenzilate
5124-30-1	Methylene-bis-(4-cyclo-hexylisocyanate)
528-29-0	Dinitrobenzene, all isomers
53-70-3	Dibenz[a,h]anthracene
53-96-3	2-Acetylaminofluorene
531-82-8	N-(4-(5-Nitro-2-furyl)-2-thiazolyl)acetamide
532-27-4	a-Chloroacetophenone
534-52-1	4,6-Dinitro-o-cresol
54-11-5	Nicotine
540-59-0	1,2-Dichloroethylene
540-73-8	1,2-Dimethylhydrazine
540-84-1	2,2,4-Trimethylpentane
540-88-5	tert-Butyl acetate
541-85-5	Ethyl amyl ketone
542-75-6	1,3-Dichloropropene
542-88-1	Dichloromethyl ether
542-92-7	Cyclopentadiene
55-18-5	N-Nitrosodiethylamine
55-38-9	Fenthion
55-63-0	Nitroglycerin
552-30-7	Trimellitic anhydride

Table Att-I-1. Consolidated Regulatory DQO Input List (702 Compounds). (20 Sheets)

CAS #	Constituent
555-84-9	1-(5-Nitrofurfurylidene)amino)-2-imidazolidinone
556-52-5	Glycidol
55720-99-5	Chlorinated diphenyl oxide
55738-54-0	trans-2((Dimethylamino)methylimino)-5-(2-(5-nitro-2-furyl) vinyl-1,3,4-oxadiazole
558-13-4	Carbon tetrabromide
56-23-5	Carbon tetrachloride
56-38-2	Parathion
56-55-3	Benzo(a)anthracene
563-12-2	Ethion
563-80-4	3-Methyl-2-butanone
57-14-7	1,1-Dimethylhydrazine
57-24-9	Strychnine
57-57-8	B-Propiolactone
57-74-9	Chlordane
57-97-6	7,12-Dimethylbenz[a]anthracene
5714-22-7	Sulfur pentafluoride
58-89-9	gamma-BHC (Lindane)
583-60-8	o-Methylcyclohexanone
584-84-9	2,4-Toluene diisocyanate
59-87-0	Nitrofurazone
59-89-2	N-Nitrosomorpholine
591-78-6	2-Hexanone
592-62-1	Methyl azoxymethyl acetate
593-60-2	Vinyl bromide
59355-75-8	Methyl acetylene-propadiene mixture (MAPP)
594-42-3	Perchloromethyl mercaptan
594-72-9	1,1-Dichloro-1-nitroethane
60-11-7	p-Dimethylaminoazobenzene
60-29-7	Ethyl ether
60-34-4	Methylhydrazine
60-35-5	Acetamide
60-57-1	Dieldrin
600-25-9	1-Chloro-1-nitropropane
602-87-9	5-Nitroacenaphthene
603-34-9	Triphenyl amine

Table Att-I-1. Consolidated Regulatory DQO Input List (702 Compounds). (20 Sheets)

CAS #	Constituent
61-82-5	Amitrole
613-35-4	N,N-Diacetylbenzidine
615-53-2	N-Nitroso-N-methylurethane
62-38-4	Phenylmercury acetate
62-53-3	Aniline
62-73-7	Dichlorvas
62-74-8	Fluoroacetic acid, sodium salt (Fratol)
62-75-9	N-Nitroso-N,N-dimethylamine
62207-76-5	Fluomine
624-83-9	Methyl isocyanate
626-17-5	m-Phthalodinitrile
626-38-0	sec-Amyl acetate
627-13-4	Nitric acid, propyl ester
628-63-7	n-Amyl acetate
628-96-6	Ethylene glycol dinitrate
63-25-2	Carbaryl
63-92-3	Phenoxybenzamine hydrochloride
630-08-0	Carbon monoxide
636-21-5	o-Toluidine hydrochloride
638-21-1	Phenylphosphine
64-17-5	Ethyl alcohol
64-18-6	Formic acid
64-19-7	Acetic acid
64-67-5	Diethyl sulfate
64091-91-4	4-(Methylnitrosamino)-1-(3-pyridyl)-1-butanone
6423-43-4	Propylene glycol dinitrate
67-45-8	Furazolidone
67-56-1	Methyl alcohol
67-63-0	2-Propyl alcohol
67-64-1	2-Propanone (Acetone)
67-66-3	Chloroform
67-72-1	Hexachloroethane
68-11-1	Thioglycolic acid
68-12-2	Dimethylformamide
680-31-9	Hexamethylphosphoramide
681-84-5	Methyl silicate

Table Att-I-1. Consolidated Regulatory DQO Input List (702 Compounds). (20 Sheets)

CAS #	Constituent
684-16-2	Hexafluoroacetone
684-93-5	N-Nitroso-N-methylurea
68476-85-7	Liquified petroleum gas
6923-22-4	Monocrotophos
696-28-6	Dichlorophenylarsine
71-23-8	n-Propyl alcohol
71-36-3	n-Butanol
71-43-2	Benzene
71-55-6	1,1,1-Trichloroethane
72-20-8	Endrin
72-43-5	Methoxychlor
74-83-9	Bromomethane
74-87-3	Chloromethane
74-88-4	Iodomethane
74-89-5	Methylamine
74-90-8	Hydrogen cyanide
74-93-1	Thiomethanol
74-96-4	Ethyl bromide
74-97-5	Bromochloromethane
74-99-7	Methylacetylene
7429-90-5	Aluminum
7429-90-5Ca	Aluminum, Al alkyls
7429-90-5Cb	Aluminum, as AL pyro powders
7429-90-5Cc	Aluminum, as Al soluble salts
7429-90-5Ce	Aluminum, as Al welding fumes
7439-89-6D	Iron salts, soluble as Fe
7439-92-1	Lead
7439-92-1D	Lead compounds
7439-96-5	Manganese
7439-96-5Ca	Manganese dust & compounds
7439-96-5Cb	Manganese fume
7439-97-6	Mercury
7439-97-6Ca	Mercury, Aryl & inorganic cmpd
7439-97-6Cb	Mercury, as Hg Alkyl compounds
7439-97-6Cc	Mercury, vapors except alkyl
7439-98-7Ca	Molybdenum, insoluble cpds

Table Att-I-1. Consolidated Regulatory DQO Input List (702 Compounds). (20 Sheets)

CAS #	Constituent
7439-98-7Cb	Molybdenum, as Mo soluble cpds
7440-02-0	Nickel
7440-02-0C	Nickel compounds
7440-06-4	Platinum, metal
7440-06-4C	Platinum, soluble salts as Pt
7440-16-6	Rhodium
7440-16-6Ca	Rhodium, insoluble compounds
7440-16-6Cb	Rhodium, soluble compounds
7440-22-4	Silver
7440-22-4Da	Silver, soluble compounds as Ag
7440-25-7C	Tantalum, metal & oxide dusts
7440-28-0C	Thallium, soluble compounds, Tl
7440-31-5	Tin, oxide & inorganic except SnH4
7440-31-5a	Tin, metal
7440-31-5C	Tin, organic compounds, as Sn
7440-33-7Ca	Tungsten, insoluble compounds
7440-33-7Cb	Tungsten, soluble compounds
7440-36-0	Antimony
7440-36-0C	Antimony & compounds as Sb
7440-38-2	Arsenic
7440-38-2C	Arsenic and inorganic arsenic compounds
7440-39-3Da	Barium, soluble compounds Ba
7440-41-7	Beryllium
7440-43-9	Cadmium
7440-47-3	Chromium
7440-47-3Da	Chromium, hexavalent metal and compounds
7440-47-3Db	Chromium (II) compounds, as Cr
7440-47-3Dc	Chromium (III) compounds, Cr
7440-48-4	Cobalt
7440-48-4a	Cobalt as Co metal dust and fume
7440-50-8	Copper
7440-50-8C	Copper, Dusts and mists, as Cu
7440-58-6	Hafnium
7440-61-1C	Uranium, insoluble & soluble
7440-65-5C	Yttrium, metal and compounds as Y
7440-67-7C	Zirconium compounds, as Zr

Table Att-I-1. Consolidated Regulatory DQO Input List (702 Compounds). (20 Sheets)

CAS #	Constituent
7440-74-6C	Indium, & compounds as In
7446-09-5	Sulfur dioxide
7446-27-7	Lead phosphate
748-79-4	Mercuric chloride
7488-56-4	Selenium sulfide
75-00-3	Chloroethane
75-01-4	1-Chloroethene
75-04-7	Ethylamine
75-05-8	Acetonitrile
75-07-0	Acetaldehyde
75-08-1	Ethyl mercaptan
75-09-2	Dichloromethane (Methylene Chloride)
75-12-7	Formamide
75-15-0	Carbon disulfide
75-21-8	Oxirane
75-25-2	Tribromomethane
75-31-0	Isopropylamine
75-34-3	1,1-Dichloroethane
75-35-4	1,1-Dichloroethene
75-43-4	Dichlorofluoromethane
75-44-5	Phosgene
75-45-6	Chlorodifluoromethane
75-47-8	Iodoform
75-50-3	Trimethylamine
75-52-5	Nitromethane
75-55-8	2-Methylaziridine
75-56-9	Propylene oxide
75-61-6	Difluorodibromomethane
75-63-8	Trifluorobromomethane
75-65-0	2-Methyl-2-propanol
75-69-4	Trichlorofluoromethane
75-71-8	Dichlorodifluoromethane
75-74-1	Tetramethyl lead, as Pb
75-99-0	2,2-Dichloropropionic acid
7550-45-0	Titanium tetrachloride
7553-56-2	Iodine

Table Att-I-1. Consolidated Regulatory DQO Input List (702 Compounds). (20 Sheets)

CAS #	Constituent
7572-29-4	Dichloroacetylene
7580-67-8	Lithium hydride
759-73-9	N-Nitroso-N-ethylurea
76-03-9	Trichloroacetic acid
76-06-2	Chloropicrin
76-11-9	1,1,1,2-Tetrachloro-2,2-difluoroethane
76-12-0	1,1,2,2-Tetrachloro-1,2-difluoroethane
76-13-1	1,2,2-Trichlorotrifluoroethane (Freon 113)
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane
76-15-3	Chloropentafluoroethane
76-22-2	Camphor, synthetic
76-44-8	Heptachlor
7616-94-6	Perchloryl fluoride
7631-90-5	Sodium bisulfite
764-41-0	1,4-Dichloro-2-butene
7646-85-7	Zinc chloride fume
7647-01-0	Hydrogen chloride
765-34-4	Glycidylaldehyde
7664-38-2	Phosphoric acid
7664-39-3	Hydrogen fluoride
7664-41-7	Ammonia
7664-93-9	Sulfuric acid
768-52-5	N-Isopropylaniline
7681-57-4	Sodium metabisulfite
7697-37-2	Nitric acid/Nitrate
77-47-4	Hexachlorocyclopentadiene
77-73-6	Dicyclopentadiene
77-78-1	Dimethyl sulfate
7719-09-7	Thionyl chloride
7719-12-2	Phosphorus trichloride
7722-84-1	Hydrogen peroxide
7722-88-5	Tetrasodium pyrophosphate
7723-14-0	Phosphorus
7726-95-6	Bromine
7758-97-6	Lead chromate, as Cr
7773-06-0	Ammonium sulfamate

Table Att-I-1. Consolidated Regulatory DQO Input List (702 Compounds). (20 Sheets)

CAS #	Constituent
7782-41-4	Fluorine
7782-49-2	Selenium
7782-49-2C	Selenium compounds, as Se
7782-50-5	Chlorine
7782-65-2	Germanium tetrahydride
7782-82-3	Sodium selenite
7783-06-4	Hydrogen sulfide
7783-07-5	Hydrogen selenide, as Se
7783-41-7	Oxygen difluoride
7783-54-2	Nitrogen trifluoride
7783-60-0	Sulfur tetrafluoride
7783-70-2	Antimony pentafluoride
7783-79-1	Selenium hexafluoride, as Se
7783-80-4	Tellurium hexafluoride, as Te
7784-42-1	Arsine
7786-34-7	Mevinphos
7789-30-2	Bromine pentafluoride
7790-91-2	Chlorine trifluoride
78-00-2	Tetraethyl lead
78-10-4	Ethyl silicate
78-30-8	Triorthocresyl phosphate
78-34-2	Dioxathion
78-59-1	Isophorone
78-83-1	2-Methylpropyl alcohol
78-87-5	1,2-Dichloropropane
78-92-2	1-Methylpropyl alcohol
78-93-3	2-Butanone (Methyl ethyl ketone)
7803-51-2	Phosphine
7803-52-3	Stibine
7803-62-5	Silicon tetrahydride
79-00-5	1,1,2-Trichloroethane
79-01-6	1,1,2-Trichloroethylene
79-04-9	Chloroacetyl chloride
79-06-1	Acrylamide
79-09-4	Propanoic acid
79-10-7	2-Propenoic acid

Table Att-I-1. Consolidated Regulatory DQO Input List (702 Compounds). (20 Sheets)

CAS #	Constituent
79-11-8	Chloroacetic acid
79-20-9	Methyl acetate
79-24-3	Nitroethane
79-27-6	Acetylene tetrabromide
79-34-5	1,1,2,2-Tetrachloroethane
79-41-4	Methacrylic acid
79-44-7	Dimethylcarbamoyl chloride
79-46-9	2-Nitropropane
794-93-4	Panfuran S (dihydroxymethylfuratrizine)
80-62-6	Methyl methacrylate
8001-35-2	Toxaphene
8001-58-9	Creosote
8002-74-2	Paraffin wax fume
8003-34-7	Pyrethrum
8006-64-2	Turpentine
8012-95-1	Oil mist, mineral
8022-00-2	Methyl demeton
8030-30-6	Rubber solvent (Naphtha)
8032-32-4	VM & P Naphtha
8052-42-4	Asphalt (petroleum) fumes
8065-48-3	Demeton
81-81-2	Warfarin (>0.3%)
82-68-8	Pentachloronitrobenzene (PCNB)
822-06-0	Hexamethylene diisocyanate
83-26-1	Pindone
83-79-4	Rotenone
838-88-0	4,4'-Methylenebis(2-methylaniline)
84-66-2	Diethyl phthalate
84-74-2	Di-n-butylphthalate
85-00-7	Diquat
85-44-9	Phthalic anhydride
86-30-6	N-Nitrosodiphenylamine
86-50-0	Azinphos-methyl
86-88-4	alpha-Naphthylthiourea
87-68-3	Hexachlorobutadiene
87-86-5	Pentachlorophenol

Table Att-I-1. Consolidated Regulatory DQO Input List (702 Compounds). (20 Sheets)

CAS #	Constituent
88-06-2	2,4,6-Trichlorophenol
88-72-2	Nitrotoluene
88-89-1	Picric acid
89-72-5	o-sec-Butylphenol
90-04-0	o-Anisidine
91-20-3	Naphthalene
91-22-5	Quinoline
91-94-1	3,3 -Dichlorobenzidine
92-52-4	1,1`-Biphenyl
92-67-1	4-Aminobiphenyl
92-84-2	Phenothiazine
92-87-5	Benzidine
92-93-3	4-Nitrobiphenyl
924-16-3	N-Nitrosodi-n-butylamine
93-76-5	2,4,5-T
94-36-0	Benzoyl Peroxide
94-75-7	2,4-D
944-22-9	Fonofos
95-13-6	Indene
95-48-7	o-Cresol
95-49-8	o-Chlorotoluene
95-50-1	1,2-Dichlorobenzene
95-53-4	o-Toluidine (2-methylaniline)
95-80-7	Toluene-2,4-diamine
95-95-4	2,4,5-Trichlorophenol
96-09-3	Styrene oxide
96-12-8	1,2-Dibromo-3-chloropropane
96-18-4	1,2,3-Trichloropropane
96-22-0	3-Pentanone
96-33-3	Methyl acrylate
96-45-7	Ethylenethiourea
96-69-5	Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl) sulfide
97-56-3	o-Aminoazotoluene
97-77-8	Disulfiram
98-00-0	Furfuryl alcohol
98-01-1	Furfural

Table Att-I-1. Consolidated Regulatory DQO Input List (702 Compounds). (20 Sheets)

CAS #	Constituent
98-07-7	Benzotrichloride
98-51-1	p-tert-Butyltoluene
98-82-2	Cumene
98-82-8	(1-Methylethyl)benzene
98-83-9	Methylstyrene
98-86-2	Acetophenone
98-95-3	Nitrobenzene
999-61-1	2-Hydroxypropyl acrylate
I4	Aluminum smelter polyaromatic hydrocarbon emissions
I51	Cotton dust, raw
NA20	Welding fumes
NA22	Fine mineral fibers
NA23	Fibrous glass dust
NA24	Dioxins and furans
NA25	Coke oven emissions
PAH	Polyaromatic hydrocarbons (PAH)
PART	Particulates
UN6	Isopropyl oils
UN8	Nitrofurans

CAS # = chemical abstract services number.
DQO = data quality objective.

Table Att-I-2. Non-organic or Organo-metallic Regulated Compounds Considered in Separate Logic (190 Compounds). (7 Sheets)

CAS #	Constituent	TIC/ Mixture	Inorganic	Organo Metallic	Tests	Cation	Anion
10025-67-9	Sulfur monochloride		X				Cl, S
10025-73-7	Chromic chloride		X			Cr	Cl
10025-87-3	Phosphorus oxychloride		X			P	Cl
10026-13-8	Phosphorus pentachloride		X			P	Cl
10028-15-6	Ozone		X			O2	
10035-10-6	Hydrogen bromide		X				Br
10045-94-0	Mercuric nitrate		X			Hg	NO3
10049-04-4	Chlorine dioxide		X				Cl
10102-43-9	Nitric oxide		X				NO3

Table Att-I-2. Non-organic or Organo-metallic Regulated Compounds Considered in Separate Logic (190 Compounds). (7 Sheets)

CAS #	Constituent	TIC/ Mixture	Inorganic	Organo Metallic	Tests	Cation	Anion
10102-44-0	Nitrogen dioxide		X				NO2
10210-68-1	Cobalt carbonyl as Co			X		Co	
102-54-5	Dicyclopentadienyl iron			X		Fe	
10294-33-4	Boron tribromide		X			B	Br
110-54-3D	Hexane, other isomers	X					
111-46-6D	Glycol ethers	X					
1189-85-1	tert-Butyl chromate, as CrO3		X			Cr	
12035-72-2	Nickel refinery dust		X			Ni	
12079-65-1	Manganese cyclopentadienyl tricarbonyl			X		Mn	
12108-13-3	Methylcyclopentadienylmanganese tricarbonyl			X		Mn	
12125-02-9	Ammonium chloride (fume)		X				NH4, Cl
12604-58-9	Ferrovanadium dust		X			Fe, V	
1303-86-2	Boron oxide		X			B	
1303-96-4Ca	Borates, anhydrous		X			B	
1303-96-4Cb	Borates, pentahydrate		X			B	
1303-96-4Cc	Borates, decahydrate		X			B	
1304-82-1	Bismuth telluride		X			Bi, Te	
1305-62-0	Calcium hydroxide		X			Ca	OH
1305-78-8	Calcium oxide		X			Ca	
1309-37-1	Iron oxide fume, Fe2O3 as Fe		X			Fe	
1309-48-4	Magnesium oxide fume		X			Mg	
1309-64-4	Antimony trioxide, as Sb		X			Sb	
1310-58-3	Potassium hydroxide		X			K	OH
1310-73-2	Sodium hydroxide		X			Na	OH
1314-13-2	Zinc oxide, fume		X			Zn	
1314-20-1	Thorium dioxide		X			Th	
1314-62-1	Vanadium pentoxide		X			V	
1314-80-3	Phosphorus pentasulfide		X			P, S	
1319-77-3	Cresol polymers	X					
1332-21-4	Asbestos (fiberous)		X			Mg, Si	
1333-86-4	Carbon black		X			C	
13410-01-0	Sodium selenate		X			Na, Se	
1345-04-6	Antimony trisulfide		X			Sb	S
13463-39-3	Nickel carbonyl			X		Ni	

Table Att-I-2. Non-organic or Organo-metallic Regulated Compounds Considered in Separate Logic (190 Compounds). (7 Sheets)

CAS #	Constituent	TIC/ Mixture	Inorganic	Organo Metallic	Tests	Cation	Anion
13463-40-6	Iron pentacarbonyl, as Fe		X			Fe	
13494-80-9C	Tellurium & compounds as Te		X			Te	
13530-65-9	Zinc chromates		X			Zn, Cr	
143-33-9	Sodium cyanide		X			Na	CN
14977-61-8	Chromylchloride		X			Cr	Cl
151-50-8	Potassium cyanide		X			K	CN
156-62-7	Calcium cyanamide		X			Ca	
16842-03-8	Cobalt hydrocarbonyl			X		Co	
16984-48-8	Fluoride		X				F
17702-41-9	Decaborane		X			B	
19287-45-7	Diborane		X			B	
19624-22-7	Pentaborane		X			B	
20816-12-0	Osmium tetroxide		X			Os	
2095-58-1	Boron trifluoride		X			B	F
21351-79-1	Cesium hydroxide		X			Cs	OH
2551-62-4	Sulfur hexafluoride		X				F, S
26628-22-8	Sodium azide			X		Na	
2699-79-8	Sulfuryl fluoride		X				S, F
28300-74-5	Antimony potassium tartrate		X			Sb, K	
301-04-2	Lead acetate			X		Pb	
353-50-4	Carbon oxyfluoride		X			C	F
3687-31-8	Lead arsenate, as Pb3 (A2O4)2		X			Pb, As	
460-19-5	Cyanogen		X				CN
463-58-1	Carbon oxide sulfide (COS)		X			C	S
506-77-4	Cyanogen chloride		X				Cl, CN
51-12-5	Cyanides, as CN		X				CN
558-13-4	Carbon tetrabromide		X			C	Br
5714-22-7	Sulfur pentafluoride		X				F, S
62207-76-5	Fluomine			X		Co	
62-38-4	Phenylmercury acetate			X			
62-74-8	Fluoroacetic acid, sodium salt (Fratol)			X			
630-08-0	Carbon monoxide		X			C	
7429-90-5	Aluminum		X			Al	
7429-90-5Ca	Aluminum, Al alkyls		X			Al	
7429-90-5Cb	Aluminum, as AL pyro powders		X			Al	

Table Att-I-2. Non-organic or Organo-metallic Regulated Compounds Considered in Separate Logic (190 Compounds). (7 Sheets)

CAS #	Constituent	TIC/ Mixture	Inorganic	Organo Metallic	Tests	Cation	Anion
7429-90-5Cc	Aluminum, as Al soluble salts		X			Al	
7429-90-5Ce	Aluminum, as Al welding fumes		X			Al	
7439-89-6D	Iron salts, soluble as Fe		X			Fe	
7439-92-1	Lead		X			Pb	
7439-92-1D	Lead compounds		X			Pb	
7439-96-5	Manganese		X			Mn	
7439-96-5Ca	Manganese dust & compounds		X			Mn	
7439-96-5Cb	Manganese fume		X			Mn	
7439-97-6	Mercury		X			Hg	
7439-97-6Ca	Mercury, Aryl & inorganic cmpd		X			Hg	
7439-97-6Cb	Mercury, as Hg Alkyl compounds		X			Hg	
7439-97-6Cc	Mercury, vapors except alkyl		X			Hg	
7439-98-7Ca	Molybdenum, insoluble cpds		X			Mo	
7439-98-7Cb	Molybdenum, as Mo soluble cpds		X			Mo	
7440-02-0	Nickel		X			Ni	
7440-02-0C	Nickel compounds		X			Ni	
7440-06-4	Platinum, metal		X			Pt	
7440-06-4C	Platinum, soluble salts as Pt		X			Pt	
7440-16-6	Rhodium		X			Rh	
7440-16-6Ca	Rhodium, insoluble compounds		X			Rh	
7440-16-6Cb	Rhodium, soluble compounds		X			Rh	
7440-22-4	Silver		X			Ag	
7440-22-4Da	Silver, soluble compounds as Ag		X			Ag	
7440-25-7C	Tantalum, metal & oxide dusts		X			Ta	
7440-28-0C	Thallium, soluble compounds, Tl		X			Tl	
7440-31-5	Tin, oxide & inorganic except SnH4		X			Sn	
7440-31-5a	Tin, metal		X			Sn	
7440-31-5C	Tin, organic compounds, as Sn		X			Sn	
7440-33-7Ca	Tungsten, insoluble compounds		X			W	
7440-33-7Cb	Tungsten, soluble compounds		X			W	
7440-36-0	Antimony		X			Sb	
7440-36-0C	Antimony & compounds as Sb		X			Sb	
7440-38-2	Arsenic		X			As	
7440-38-2C	Arsenic and inorganic arsenic compounds		X			As	
7440-39-3Da	Barium, soluble compounds Ba		X			Ba	

Table Att-I-2. Non-organic or Organo-metallic Regulated Compounds Considered in Separate Logic (190 Compounds). (7 Sheets)

CAS #	Constituent	TIC/ Mixture	Inorganic	Organo Metallic	Tests	Cation	Anion
7440-41-7	Beryllium		X			Be	
7440-43-9	Cadmium		X			Cd	
7440-47-3	Chromium		X			Cr	
7440-47-3Da	Chromium, hexavalent metal and compounds		X			Cr	
7440-47-3Db	Chromium (II) compounds, as Cr		X			Cr	
7440-47-3Dc	Chromium (III) compounds, Cr		X			Cr	
7440-48-4	Cobalt		X			Co	
7440-48-4a	Cobalt as Co metal dust and fume		X			Co	
7440-50-8	Copper		X			Cu	
7440-50-8C	Copper, Dusts and mists, as Cu		X			Cu	
7440-58-6	Hafnium		X			Hf	
7440-61-1C	Uranium, insoluble & soluble		X			U	
7440-65-5C	Yttrium, metal and compounds as Y		X			Y	
7440-67-7C	Zirconium compounds, as Zr		X			Zr	
7440-74-6C	Indium, & compounds as In		X			In	
7446-09-5	Sulfur dioxide		X			S	
7446-27-7	Lead phosphate		X			Pb	PO4
748-79-4	Mercuric chloride		X			Hg	Cl
7488-56-4	Selenium sulfide		X			Se	S
74-90-8	Hydrogen cyanide		X				CN
75-44-5	Phosgene		X				Cl
7550-45-0	Titanium tetrachloride		X			Ti	Cl
7553-56-2	Iodine		X				I
75-74-1	Tetramethyl lead, as Pb			X		Pb	
7580-67-8	Lithium hydride		X			Li	
7616-94-6	Perchloryl fluoride		X				Cl, F
7631-90-5	Sodium bisulfite		X			Na	SO3
7646-85-7	Zinc chloride fume		X			Zn	Cl
7647-01-0	Hydrogen chloride		X				Cl
7664-38-2	Phosphoric acid		X				PO4
7664-39-3	Hydrogen fluoride		X				F
7664-41-7	Ammonia		X				NH4
7664-93-9	Sulfuric acid		X				SO4
7681-57-4	Sodium metabisulfite		X			Na	SO3
7697-37-2	Nitric acid/Nitrate		X				NO3

Table Att-I-2. Non-organic or Organo-metallic Regulated Compounds Considered in Separate Logic (190 Compounds). (7 Sheets)

CAS #	Constituent	TIC/ Mixture	Inorganic	Organo Metallic	Tests	Cation	Anion
7719-09-7	Thionyl chloride		X			S	Cl
7719-12-2	Phosphorus trichloride		X			P	Cl
7722-84-1	Hydrogen peroxide		X				
7722-88-5	Tetrasodium pyrophosphate		X			Na	PO4
7723-14-0	Phosphorus		X			P	
7726-95-6	Bromine		X				Br
7758-97-6	Lead chromate, as Cr		X			Pb, Cr	
7773-06-0	Ammonium sulfamate		X			S	NH4
7782-49-2	Selenium		X			Se	
7782-49-2C	Selenium compounds, as Se		X			Se	
7782-50-5	Chlorine		X				Cl
7782-65-2	Germanium tetrahydride		X			Ge	
7782-82-3	Sodium selenite		X			Na, Se	
7783-06-4	Hydrogen sulfide		X				S
7783-07-5	Hydrogen selenide, as Se		X			Se	
7783-41-7	Oxygen difluoride		X				F
7783-54-2	Nitrogen trifluoride		X			N	F
7783-60-0	Sulfur tetrafluoride		X				F, S
7783-70-2	Antimony pentafluoride		X			Sb	F
7783-79-1	Selenium hexafluoride, as Se		X			Se	F
7783-80-4	Tellurium hexafluoride, as Te		X			Te	F
7784-42-1	Arsine		X			As	
7789-30-2	Bromine pentafluoride		X				F. Br
7790-91-2	Chlorine trifluoride		X				F, Cl
78-00-2	Tetraethyl lead			X		Pb	
7803-52-3	Stibine		X			Sb	
7803-62-5	Silicon tetrahydride		X			Si	
8002-74-2	Paraffin wax fume	X					
8012-95-1	Oil mist, mineral	X					
8030-30-6	Rubber solvent (Naphtha)	X					
8032-32-4	VM & P Naphtha	X					
I4	Aluminum smelter polyaromatic hydrocarbon emissions			X		Al	
I51	Cotton dust, raw	X	X				
NA20	Welding fumes	X	X				
NA22	Fine mineral fibers	X	X				

Table Att-I-2. Non-organic or Organo-metallic Regulated Compounds Considered in Separate Logic (190 Compounds). (7 Sheets)

CAS #	Constituent	TIC/ Mixture	Inorganic	Organo Metallic	Tests	Cation	Anion
NA23	Fibrous glass dust		X			Na, Si	CO3
NA24	Dioxins and furans	X					
NA25	Coke oven emissions	X					
PAH	Polyaromatic hydrocarbons (PAH)	X					
PART	Particulates		X		X		
UN6	Isopropyl oils	X					
UN8	Nitrofurans	X					

CAS # = chemical abstract services number.

Table Att-I-3. Regulated Organic Input List (511 Compounds). (14 Sheets)

CAS #	Constituent
100-00-5	p-Nitrochlorobenzene
100-01-6	4-Nitroaniline
100-02-7	4-Nitrophenol
100-37-8	Diethylaminoethanol
100-41-4	Ethyl benzene
100-42-5	Styrene
100-44-7	Benzyl chloride
100-61-8	N-Methylbenzenamine
100-63-0	Phenylhydrazine
100-74-3	N-Ethylmorpholine
101-14-4	4,4'-Methylenebis(2-chloroaniline)
101-68-8	Methylene bis(phenyl isocyanate)
101-77-9	4,4-Methylene dianiline
101-80-4	4,4'-Diaminodiphenyl ether
101-84-8	Diphenyl ether
101-90-6	Diglycidyl resorcinol ether
102-81-8	2-N-Dibutylaminoethanol
105-46-4	sec-Butyl acetate
105-60-2	Caprolactam, vapor
105-60-2a	Caprolactam, dust
10595-95-6	N-Nitrosomethylethylamine
106-35-4	3-Heptanone
106-44-5	4-Methylphenol
106-46-7	1,4-Dichlorobenzene

Table Att-I-3. Regulated Organic Input List (511 Compounds). (14 Sheets)

CAS #	Constituent
106-49-0	p-Toluidine
106-50-3	p-Phenylenediamine
106-51-4	p-Benzoquinone
106-87-6	Vinyl cyclohexene dioxide
106-88-7	1,2-Epoxybutane
106-89-8	Epichlorohydrin
106-92-3	Allyl glycidyl ether
106-93-4	Ethylene dibromide
106-97-8	Butane
106-99-0	1,3-Butadiene
107-02-8	Acrolein
107-05-1	3-Chloropropene
107-06-2	1,2-Dichloroethane
107-07-3	Ethylene chlorohydrin
107-13-1	Acrylonitrile
107-15-3	Ethylene diamine
107-18-6	2-Propen-1-ol
107-19-7	Propargyl alcohol
107-20-0	Chloroacetaldehyde
107-21-1	Ethylene glycol
107-30-2	Chloromethyl methyl ether
107-31-3	Formic acid, methyl ester
107-41-5	Hexylene glycol
107-49-3	Tetraethyl pyrophosphate
107-66-4	Dibutylphosphate
107-87-9	2-Pentanone
107-98-2	Propylene glycol monomethyl ether
108-03-2	1-Nitropropane
108-05-4	Acetic acid vinyl ester
108-10-1	4-Methyl-2-pentanone (MIBK)
108-11-2	Methyl isobutyl carbinol
108-18-9	Diisopropylamine
108-20-3	Bis(isopropyl) ether
108-21-4	Isopropyl acetate
108-24-7	Acetic anhydride
108-31-6	Maleic anhydride (2,5-Furandione)
108-39-4	m-Cresol

Table Att-I-3. Regulated Organic Input List (511 Compounds). (14 Sheets)

CAS #	Constituent
108-43-0	Chlorophenols
108-44-1	m-Toluidine
108-46-3	Resorcinol (1,3-Benzenediol)
108-83-8	Diisobutyl ketone
108-84-9	sec-Hexyl acetate
108-87-2	Methylcyclohexane
108-88-3	Toluene
108-90-7	Chlorobenzene
108-91-8	Cyclohexylamine
108-93-0	Cyclohexanol
108-94-1	Cyclohexanone
108-95-2	Phenol
108-98-5	Thiophenol
109-59-1	Isopropoxyethanol
109-60-4	n-Propyl acetate
109-66-0	n-Pentane
109-73-9	n-Butylamine
109-79-5	n-Butyl mercaptan
109-86-4	2-Methoxyethanol
109-87-5	Methylal
109-89-7	Diethylamine
109-94-4	Ethyl formate
109-99-9	Tetrahydrofuran
110-12-3	5-Methyl-2-hexanone
110-19-0	Isobutyl acetate
110-43-0	2-Heptanone
110-49-6	2-Methoxyethyl acetate
110-54-3	n-Hexane
110-62-3	n-Valeraldehyde
110-80-5	2-Ethoxyethanol
110-82-7	Cyclohexane
110-83-8	Cyclohexene
110-86-1	Pyridine
110-91-8	Morpholine
111-15-9	2-Ethoxyethyl acetate
111-30-8	Glutaraldehyde
111-40-0	Diethylene triamine

Table Att-I-3. Regulated Organic Input List (511 Compounds). (14 Sheets)

CAS #	Constituent
111-42-2	Diethanolamine
111-44-4	Bis(2-chloroethyl) ether
111-65-9	n-Octane
111-76-2	2-Butoxyethanol
111-84-2	n-Nonane
1120-71-4	1,3-Propane sultone
114-26-1	Propoxur
115-29-7	Endosulfan
115-86-6	Triphenyl phosphate
115-90-2	Fensulfothion
117-79-3	2-Aminoanthraquinone
117-81-7	Bis(2-ethylhexyl) phthalate
118-52-5	1,3-Dichloro-5,5-Dimethyl hydantoin
118-74-1	Hexachlorobenzene
118-96-7	2,4,6-Trinitrotoluene
119-90-4	3,3'-Dimethoxybenzidine
119-93-7	3,3'-Dimethylbenzidine.
120-80-9	Catechol
120-82-1	1,2,4-Trichlorobenzene
121-14-2	2,4-Dinitrotoluene
121-44-8	Triethylamine
121-45-9	Trimethyl phosphite
121-69-7	Dimethylaniline
121-75-5	Malathion
121-82-4	Cyclonite
122-39-4	N,N-Diphenylamine
122-60-1	Phenyl glycidyl ether
122-66-7	1,2-Diphenylhydrazine
123-19-3	4-Heptanone
123-31-9	Hydroquinone
123-38-6	n-Propionaldehyde
123-42-2	Diacetone alcohol
123-51-3	3-Methyl-1-butanol
123-86-4	Acetic acid n-butyl ester
123-91-1	1,4-Dioxan
123-92-2	Isoamyl acetate
124-40-3	Dimethylamine

Table Att-I-3. Regulated Organic Input List (511 Compounds). (14 Sheets)

CAS #	Constituent
126-73-8	Tributyl phosphate
126-85-2	Nitrogen mustard N-oxide
126-98-7	2-Methyl-2-propenenitrile
126-99-8	Chloroprene
127-18-4	1,1,2,2-Tetrachloroethene
127-19-5	N,N-Dimethylacetamide
128-37-0	2,6-Bis(tert-butyl)-4-methylphenol
129-15-7	2-Methyl-1-nitroanthraquinone
1300-73-8	Xylidine
131-11-3	Dimethyl phthalate
13121-70-5	Cyhexatin
132-64-9	Dibenzofuran
1321-64-8	Pentachloronaphthalene
1321-65-9	Trichloronaphthalene
1321-74-0	Divinyl benzene
133-06-2	Captan
133-90-4	Chloramben
1335-87-1	Hexachloronaphthalene
1335-88-2	Tetrachloronaphthalene
1336-36-3	Polychlorinated biphenyls (PCBs)
1338-23-4	Methyl ethyl ketone peroxide
134-32-7	alpha-Naphthylamine
135-20-6	Cupferron
13552-44-8	4,4-Methylenedianiline dihydrochloride
136-78-7	Sesone
137-05-3	Methyl-2-cyanoacrylate
137-26-8	Thiram
138-22-7	n-Butyl lactate
13838-16-9	Enflurane
139-65-1	4,4'-Thiodianiline
139-91-3	5-(Morpholinomethyl)-3-amino-2-oxazolidinone (furaltudone)
1395-21-7	Subtilisins
140-88-5	Ethylacrylate
141-32-2	Butylacrylate
141-43-5	Ethanolamine
141-66-2	Dicrotophos
141-78-6	Acetic acid ethyl ester

Table Att-I-3. Regulated Organic Input List (511 Compounds). (14 Sheets)

CAS #	Constituent
141-79-7	4-Methyl-3-penten-2-one
142-64-3	Piperazine dihydrochloride
142-82-5	n-Heptane
144-62-7	Oxalic acid
14484-64-1	Ferbam
1477-55-0	m-Xylene-a,a'-diamine
148-01-6	Dinitolamide
150-76-5	4-Methoxyphenol
151-56-4	Ethyleneimine
151-67-7	Halothane
1563-66-2	Carbofuran
1582-09-8	Trifluralin
1615-80-1	N,N'-Diethylhydrazine
16219-75-3	Ethylidene norbornene
1634-04-4	Methyl tert-butyl ether
16752-77-5	Methomyl
1694-09-3	Benzyl violet 4b
1746-01-6	TCDD
17804-35-2	Benomyl
1836-75-5	Nitrofen
189-55-9	Dibenzo[a,i]pyrene
189-64-0	Dibenzo[a,h]pyrene
191-30-0	Dibenzo(a,l)pyrene
1912-24-9	Atrazine
1918-02-1	Picloram
192-65-4	Dibenzo[a,e]pyrene
1929-82-4	Nitrapyrin
193-39-5	Indeno(1,2,3-cd)pyrene
2039-87-4	o-Chlorostyrene
205-82-3	Benzo[j]fluoranthene
205-99-2	Benzo(b)fluoranthene
207-08-9	Benzo(k)fluoranthene
2104-64-5	EPN
21087-64-9	Metribuzin
2179-59-1	Allyl propyl disulfide
218-01-9	Chrysene
22224-92-6	Fenamiphos

Table Att-I-3. Regulated Organic Input List (511 Compounds). (14 Sheets)

CAS #	Constituent
2234-13-1	Octachloronaphthalene
2238-07-5	Diglycidyl ether
224-42-0	Dibenz[a,j]acridine
226-36-8	Dibenz[a,h]acridine
2385-85-5	Mirex
2425-06-1	Captafol
2426-08-6	n-Butyl glycidyl ether
2465-27-2	Auramine (technical grade)
25013-15-4	Vinyl toluene
2551-13-7	Trimethyl benzene
25639-42-3	Methylcyclohexanol
26140-60-3	Terphenyls
2646-17-5	Oil orange SS
26952-21-6	Iso-ocytl alcohol
26952-23-8	Dichloropropene
2698-41-1	o-Chlorobenylidene malonitrile
28434-86-8	3,3'-Dichloro-4,4'-diaminodiphenyl ether
287-92-3	Cyclopentane
29191-52-4	Anisidine (o-,p- isomers)
2921-88-2	Chlorpyrifos
2971-90-6	Clopidol
298-00-0	Methyl parathion
298-02-2	Phorate
298-04-4	Disulfoton
299-84-3	Ronnel
299-86-5	Crufomate
300-76-5	Naled
302-01-2	Hydrazine
302-70-5	Nitrogen mustard N-oxide hydrochloride
3068-88-0	B-Butyrolactone
309-00-2	Aldrin
314-40-9	Bromacil
319-84-6	alpha-BHC
319-85-7	beta-BHC
330-54-1	Diuron
333-41-5	Diazinon
3333-52-6	Tetramethyl succinonitrile

Table Att-I-3. Regulated Organic Input List (511 Compounds). (14 Sheets)

CAS #	Constituent
334-88-3	Diazomethane
3383-96-8	Temephos
34590-94-8	Dipropylene glycol methyl ether
35400-43-2	Sulprofos
3547-04-4	DDE (p,p'-Dichlorodiphenyldichloroethylene)
3689-24-5	Tetraethyldithiopyrophosphate (TEDP)
3697-24-3	5-Methylchrysene
3761-53-3	Ponceau MX
3825-26-1	Ammonium perfluorooctanoate
4016-14-2	Isopropyl glycidyl ether (IGE)
4098-71-9	Isophorone diisocyanate
4170-30-3	2-Butenaldehyde
420-04-2	Cyanamide
463-51-4	Ketene
4685-14-7	Paraquat
479-45-8	Tetryl
50-00-0	Formaldehyde
50-29-3	4,4-DDT
50-32-8	Benzo(a)pyrene
504-29-0	2-Aminopyridine
509-14-8	Tetranitromethane
51-28-5	2,4-Dinitrophenol
51-79-6	Ethyl carbamate (urethane)
510-15-6	Chlorobenzilate
5124-30-1	Methylene-bis-(4-cyclo-hexylisocyanate)
528-29-0	Dinitrobenzene, all isomers
53-70-3	Dibenz[a,h]anthracene
53-96-3	2-Acetylaminofluorene
531-82-8	N-(4-(5-Nitro-2-furyl)-2-thiazolyl)acetamide
532-27-4	a-Chloroacetophenone
534-52-1	4,6-Dinitro-o-cresol
54-11-5	Nicotine
540-59-0	1,2-Dichloroethylene
540-73-8	1,2-Dimethylhydrazine
540-84-1	2,2,4-Trimethylpentane
540-88-5	tert-Butyl acetate
541-85-5	Ethyl amyl ketone

Table Att-I-3. Regulated Organic Input List (511 Compounds). (14 Sheets)

CAS #	Constituent
542-75-6	1,3-Dichloropropene
542-88-1	Dichloromethyl ether
542-92-7	Cyclopentadiene
55-18-5	N-Nitrosodiethylamine
55-38-9	Fenthion
55-63-0	Nitroglycerin
552-30-7	Trimellitic anhydride
555-84-9	1-(5-Nitrofurfurylidene)amino)-2-imidazolidinone
556-52-5	Glycidol
55720-99-5	Chlorinated diphenyl oxide
55738-54-0	trans-2((Dimethylamino)methylimino)-5-(2-(5-nitro-2-furyl) vinyl-1,3,4-oxadiazole
56-23-5	Carbon tetrachloride
56-38-2	Parathion
56-55-3	Benzo(a)anthracene
563-12-2	Ethion
563-80-4	3-Methyl-2-butanone
57-14-7	1,1-Dimethylhydrazine
57-24-9	Strychnine
57-57-8	B-Propiolactone
57-74-9	Chlordane
57-97-6	7,12-Dimethylbenz[a]anthracene
58-89-9	gamma-BHC (Lindane)
583-60-8	o-Methylcyclohexanone
584-84-9	2,4-Toluene diisocyanate
59-87-0	Nitrofurazone
59-89-2	N-Nitrosomorpholine
591-78-6	2-Hexanone
592-62-1	Methyl azoxymethyl acetate
593-60-2	Vinyl bromide
59355-75-8	Methyl acetylene-propadiene mixture (MAPP)
594-42-3	Perchloromethyl mercaptan
594-72-9	1,1-Dichloro-1-nitroethane
60-11-7	p-Dimethylaminoazobenzene
60-29-7	Ethyl ether
60-34-4	Methylhydrazine
60-35-5	Acetamide
60-57-1	Dieldrin

Table Att-I-3. Regulated Organic Input List (511 Compounds). (14 Sheets)

CAS #	Constituent
600-25-9	1-Chloro-1-nitropropane
602-87-9	5-Nitroacenaphthene
603-34-9	Triphenyl amine
61-82-5	Amitrole
613-35-4	N,N-Diacetylbenzidine
615-53-2	N-Nitroso-N-methylurethane
62-53-3	Aniline
62-73-7	Dichlorvas
62-75-9	N-Nitroso-N,N-dimethylamine
624-83-9	Methyl isocyanate
626-17-5	m-Phthalodinitrile
626-38-0	sec-Amyl acetate
627-13-4	Nitric acid, propyl ester
628-63-7	n-Amyl acetate
628-96-6	Ethylene glycol dinitrate
63-25-2	Carbaryl
63-92-3	Phenoxybenzamine hydrochloride
636-21-5	o-Toluidine hydrochloride
638-21-1	Phenylphosphine
64-17-5	Ethyl alcohol
64-18-6	Formic acid
64-19-7	Acetic acid
64-67-5	Diethyl sulfate
64091-91-4	4-(Methylnitrosamino)-1-(3-pyridyl)-1-butanone
6423-43-4	Propylene glycol dinitrate
67-45-8	Furazolidone
67-56-1	Methyl alcohol
67-63-0	2-Propyl alcohol
67-64-1	2-Propanone (Acetone)
67-66-3	Chloroform
67-72-1	Hexachloroethane
68-11-1	Thioglycolic acid
68-12-2	Dimethylformamide
680-31-9	Hexamethylphosphoramide
681-84-5	Methyl silicate
684-16-2	Hexafluoroacetone
684-93-5	N-Nitroso-N-methylurea

Table Att-I-3. Regulated Organic Input List (511 Compounds). (14 Sheets)

CAS #	Constituent
68476-85-7	Liquified petroleum gas
6923-22-4	Monocrotophos
696-28-6	Dichlorophenylarsine
71-23-8	n-Propyl alcohol
71-36-3	n-Butanol
71-43-2	Benzene
71-55-6	1,1,1-Trichloroethane
72-20-8	Endrin
72-43-5	Methoxychlor
74-83-9	Bromomethane
74-87-3	Chloromethane
74-88-4	Iodomethane
74-89-5	Methylamine
74-93-1	Thiomethanol
74-96-4	Ethyl bromide
74-97-5	Bromochloromethane
74-99-7	Methylacetylene
75-00-3	Chloroethane
75-01-4	1-Chloroethene
75-04-7	Ethylamine
75-05-8	Acetonitrile
75-07-0	Acetaldehyde
75-08-1	Ethyl mercaptan
75-09-2	Dichloromethane (Methylene Chloride)
75-12-7	Formamide
75-15-0	Carbon disulfide
75-21-8	Oxirane
75-25-2	Tribromomethane
75-31-0	Isopropylamine
75-34-3	1,1-Dichloroethane
75-35-4	1,1-Dichloroethene
75-43-4	Dichlorofluoromethane
75-45-6	Chlorodifluoromethane
75-47-8	Iodoform
75-50-3	Trimethylamine
75-52-5	Nitromethane
75-55-8	2-Methylaziridine

Table Att-I-3. Regulated Organic Input List (511 Compounds). (14 Sheets)

CAS #	Constituent
75-56-9	Propylene oxide
75-61-6	Difluorodibromomethane
75-63-8	Trifluorobromomethane
75-65-0	2-Methyl-2-propanol
75-69-4	Trichlorofluoromethane
75-71-8	Dichlorodifluoromethane
75-99-0	2,2-Dichloropropionic acid
7572-29-4	Dichloroacetylene
759-73-9	N-Nitroso-N-ethylurea
76-03-9	Trichloroacetic acid
76-06-2	Chloropicrin
76-11-9	1,1,1,2-Tetrachloro-2,2-difluoroethane
76-12-0	1,1,2,2-Tetrachloro-1,2-difluoroethane
76-13-1	1,2,2-Trichlorotrifluoroethane (Freon 113)
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane
76-15-3	Chloropentafluoroethane
76-22-2	Camphor, synthetic
76-44-8	Heptachlor
764-41-0	1,4-Dichloro-2-butene
765-34-4	Glycidylaldehyde
768-52-5	N-Isopropylaniline
77-47-4	Hexachlorocyclopentadiene
77-73-6	Dicyclopentadiene
77-78-1	Dimethyl sulfate
7782-41-4	Fluorine
7786-34-7	Mevinphos
78-10-4	Ethyl silicate
78-30-8	Triorthocresyl phosphate
78-34-2	Dioxathion
78-59-1	Isophorone
78-83-1	2-Methylpropyl alcohol
78-87-5	1,2-Dichloropropane
78-92-2	1-Methylpropyl alcohol
78-93-3	2-Butanone (Methyl ethyl ketone)
7803-51-2	Phosphine
79-00-5	1,1,2-Trichloroethane
79-01-6	1,1,2-Trichloroethylene

Table Att-I-3. Regulated Organic Input List (511 Compounds). (14 Sheets)

CAS #	Constituent
79-04-9	Chloroacetyl chloride
79-06-1	Acrylamide
79-09-4	Propanoic acid
79-10-7	2-Propenoic acid
79-11-8	Chloroacetic acid
79-20-9	Methyl acetate
79-24-3	Nitroethane
79-27-6	Acetylene tetrabromide
79-34-5	1,1,2,2-Tetrachloroethane
79-41-4	Methacrylic acid
79-44-7	Dimethylcarbamoyl chloride
79-46-9	2-Nitropropane
794-93-4	Panfuran S (dihydroxymethylfuratrizine)
80-62-6	Methyl methacrylate
8001-35-2	Toxaphene
8001-58-9	Creosote
8003-34-7	Pyrethrum
8006-64-2	Turpentine
8022-00-2	Methyl demeton
8052-42-4	Asphalt (petroleum) fumes
8065-48-3	Demeton
81-81-2	Warfarin (>0.3%)
82-68-8	Pentachloronitrobenzene (PCNB)
822-06-0	Hexamethylene diisocyanate
83-26-1	Pindone
83-79-4	Rotenone
838-88-0	4,4'-Methylenebis(2-methylaniline)
84-66-2	Diethyl phthalate
84-74-2	Di-n-butylphthalate
85-00-7	Diquat
85-44-9	Phthalic anhydride
86-30-6	N-Nitrosodiphenylamine
86-50-0	Azinphos-methyl
86-88-4	alpha-Naphthylthiourea
87-68-3	Hexachlorobutadiene
87-86-5	Pentachlorophenol
88-06-2	2,4,6-Trichlorophenol

Table Att-I-3. Regulated Organic Input List (511 Compounds). (14 Sheets)

CAS #	Constituent
88-72-2	Nitrotoluene
88-89-1	Picric acid
89-72-5	o-sec-Butylphenol
90-04-0	o-Anisidine
91-20-3	Naphthalene
91-22-5	Quinoline
91-94-1	3,3 -Dichlorobenzidine
92-52-4	1,1`-Biphenyl
92-67-1	4-Aminobiphenyl
92-84-2	Phenothiazine
92-87-5	Benzidine
92-93-3	4-Nitrobiphenyl
924-16-3	N-Nitrosodi-n-butylamine
93-76-5	2,4,5-T
94-36-0	Benzoyl Peroxide
94-75-7	2,4-D
944-22-9	Fonofos
95-13-6	Indene
95-48-7	o-Cresol
95-49-8	o-Chlorotoluene
95-50-1	1,2-Dichlorobenzene
95-53-4	o-Toluidine (2-methylaniline)
95-80-7	Toluene-2,4-diamine
95-95-4	2,4,5-Trichlorophenol
96-09-3	Styrene oxide
96-12-8	1,2-Dibromo-3-chloropropane
96-18-4	1,2,3-Trichloropropane
96-22-0	3-Pentanone
96-33-3	Methyl acrylate
96-45-7	Ethylenethiourea
96-69-5	Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl) sulfide
97-56-3	o-Aminoazotoluene
97-77-8	Disulfiram
98-00-0	Furfuryl alcohol
98-01-1	Furfural
98-07-7	Benzotrichloride
98-51-1	p-tert-Butyltoluene

Table Att-I-3. Regulated Organic Input List (511 Compounds). (14 Sheets)

CAS #	Constituent
98-82-2	Cumene
98-82-8	(1-Methylethyl)benzene
98-83-9	Methylstyrene
98-86-2	Acetophenone
98-95-3	Nitrobenzene
999-61-1	2-Hydroxypropyl acrylate

CAS # = chemical abstract services number.

Table Att-I-4. Regulated Organic Compounds Detected in Vapor Phase (127 Compounds). (4 Sheets)

CAS #	Constituent	# of Detections in TWINS Vapor Database	Detected in Tank C-106
100-00-5	p-Nitrochlorobenzene	3	
100-41-4	Ethyl benzene	423	
100-42-5	Styrene	195	
101-84-8	Diphenyl ether	6	
106-35-4	3-Heptanone	158	X
106-46-7	1,4-Dichlorobenzene	120	
106-88-7	1,2-Epoxybutane	1	
106-93-4	Ethylene dibromide	45	
106-97-8	Butane	535	
106-99-0	1,3-Butadiene	46	
107-02-8	Acrolein	22	
107-05-1	3-Chloropropene	4	
107-06-2	1,2-Dichloroethane	15	
107-13-1	Acrylonitrile	1	
107-18-6	2-Propen-1-ol	5	
107-31-3	Formic acid, methyl ester	1	
107-87-9	2-Pentanone	211	
108-03-2	1-Nitropropane	3	
108-05-4	Acetic acid vinyl ester	1	
108-10-1	4-Methyl-2-pentanone (MIBK)	374	
108-20-3	Bis(isopropyl) ether	1	
108-39-4	m-Cresol	7	
108-87-2	Methylcyclohexane	132	
108-88-3	Toluene	738	
108-90-7	Chlorobenzene	66	
108-93-0	Cyclohexanol	1	
108-94-1	Cyclohexanone	192	
108-95-2	Phenol	19	
109-66-0	n-Pentane	446	X
109-99-9	Tetrahydrofuran	562	
110-12-3	5-Methyl-2-hexanone	12	
110-43-0	2-Heptanone	209	
110-54-3	n-Hexane	623	
110-62-3	n-Valeraldehyde	54	
110-82-7	Cyclohexane	256	

Table Att-I-4. Regulated Organic Compounds Detected in Vapor Phase (127 Compounds). (4 Sheets)

CAS #	Constituent	# of Detections in TWINS Vapor Database	Detected in Tank C-106
110-83-8	Cyclohexene	2	
110-86-1	Pyridine	279	
111-65-9	n-Octane	492	
111-76-2	2-Butoxyethanol	7	
111-84-2	n-Nonane	528	
117-81-7	Bis(2-ethylhexyl) phthalate	1	
120-82-1	1,2,4-Trichlorobenzene	51	
122-39-4	N,N-Diphenylamine	22	
123-19-3	4-Heptanone	44	X
123-38-6	n-Propionaldehyde	56	
123-51-3	3-Methyl-1-butanol	4	
123-86-4	Acetic acid n-butyl ester	25	
123-91-1	1,4-Dioxan	19	
126-73-8	Tributyl phosphate	73	
126-98-7	2-Methyl-2-propenenitrile	1	
127-18-4	1,1,2,2-Tetrachloroethene	415	
127-19-5	N,N-Dimethylacetamide	2	
128-37-0	2,6-Bis(tert-butyl)-4-methylphenol	13	
1336-36-3	Polychlorinated biphenyls (PCBs)		
141-78-6	Acetic acid ethyl ester	10	
141-79-7	4-Methyl-3-penten-2-one	9	
142-82-5	n-Heptane	626	
1746-01-6	TCDD		
287-92-3	Cyclopentane	16	
4170-30-3	2-Butenaldehyde	37	
50-00-0	Formaldehyde	3	
56-23-5	Carbon tetrachloride	181	
563-80-4	3-Methyl-2-butanone	34	
57-14-7	1,1-Dimethylhydrazine	6	
59-89-2	N-Nitrosomorpholine	1	
591-78-6	2-Hexanone	248	
60-34-4	Methylhydrazine	3	
60-35-5	Acetamide	3	
62-75-9	N-Nitroso-N,N-dimethylamine	62	
624-83-9	Methyl isocyanate	1	

Table Att-I-4. Regulated Organic Compounds Detected in Vapor Phase (127 Compounds). (4 Sheets)

CAS #	Constituent	# of Detections in TWINS Vapor Database	Detected in Tank C-106
627-13-4	Nitric acid, propyl ester	72	
64-17-5	Ethyl alcohol	552	
64-19-7	Acetic acid	56	
67-56-1	Methyl alcohol	594	
67-63-0	2-Propyl alcohol	191	
67-64-1	2-Propanone (Acetone)	831	
67-66-3	Chloroform	118	
68-12-2	Dimethylformamide		X
71-23-8	n-Propyl alcohol	606	
71-36-3	n-Butanol	775	
71-43-2	Benzene	638	
71-55-6	1,1,1-Trichloroethane	221	
74-83-9	Bromomethane	22	
74-87-3	Chloromethane	194	
74-99-7	Methylacetylene	9	
75-00-3	Chloroethane	82	
75-01-4	1-Chloroethene	26	
75-05-8	Acetonitrile	713	
75-07-0	Acetaldehyde	103	
75-09-2	Dichloromethane (Methylene Chloride)	567	
75-12-7	Formamide	1	
75-15-0	Carbon disulfide	16	
75-21-8	Oxirane	1	
75-34-3	1,1-Dichloroethane	29	
75-35-4	1,1-Dichloroethene	113	
75-43-4	Dichlorofluoromethane	20	
75-45-6	Chlorodifluoromethane	12	
75-50-3	Trimethylamine	1	
75-52-5	Nitromethane	8	
75-55-8	2-Methylaziridine	5	
75-65-0	2-Methyl-2-propanol	144	
75-69-4	Trichlorofluoromethane	790	
75-71-8	Dichlorodifluoromethane	252	
76-13-1	1,2,2-Trichlorotrifluoroethane (Freon 113)	255	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane	31	

Table Att-I-4. Regulated Organic Compounds Detected in Vapor Phase (127 Compounds). (4 Sheets)

CAS #	Constituent	# of Detections in TWINS Vapor Database	Detected in Tank C-106
78-83-1	2-Methylpropyl alcohol	7	
78-87-5	1,2-Dichloropropane	13	
78-92-2	1-Methylpropyl alcohol	66	
78-93-3	2-Butanone (Methyl ethyl ketone)	642	X
79-00-5	1,1,2-Trichloroethane	111	
79-01-6	1,1,2-Trichloroethylene	113	
79-09-4	Propanoic acid	5	
79-10-7	2-Propenoic acid	1	
79-20-9	Methyl acetate	4	
79-34-5	1,1,2,2-Tetrachloroethane	51	
84-66-2	Diethyl phthalate	24	
84-74-2	Di-n-butylphthalate	2	
87-68-3	Hexachlorobutadiene	42	
91-20-3	Naphthalene	4	
92-52-4	1,1`-Biphenyl	7	
95-48-7	o-Cresol	2	
95-50-1	1,2-Dichlorobenzene	27	
96-22-0	3-Pentanone	10	
98-82-8	(1-Methylethyl)benzene	2	
98-83-9	Methylstyrene	3	
98-86-2	Acetophenone	43	
98-95-3	Nitrobenzene	5	

CAS # = chemical abstract services number.
TWINS = Tank Waste Information Network System.

Table Att-I-5. Regulated Organic Compounds Without a Positive Analytical Detect in Vapor Phase (384 Compounds). (11 Sheets)

CAS #	Constituent
100-01-6	4-Nitroaniline
100-02-7	4-Nitrophenol
100-37-8	Diethylaminoethanol
100-44-7	Benzyl chloride
100-61-8	N-Methylbenzenamine
100-63-0	Phenylhydrazine
100-74-3	N-Ethylmorpholine
101-14-4	4,4'-Methylenebis(2-chloroaniline)
101-68-8	Methylene bis(phenyl isocyanate)
101-77-9	4,4-Methylene dianiline
101-80-4	4,4'-Diaminodiphenyl ether
101-90-6	Diglycidyl resorcinol ether
102-81-8	2-N-Dibutylaminoethanol
105-46-4	sec-Butyl acetate
105-60-2	Caprolactam, vapor
105-60-2a	Caprolactam, dust
10595-95-6	N-Nitrosomethylethylamine
106-44-5	4-Methylphenol
106-49-0	p-Toluidine
106-50-3	p-Phenylenediamine
106-51-4	p-Benzoquinone
106-87-6	Vinyl cyclohexene dioxide
106-89-8	Epichlorohydrin
106-92-3	Allyl glycidyl ether
107-07-3	Ethylene chlorohydrin
107-15-3	Ethylene diamine
107-19-7	Propargyl alcohol
107-20-0	Chloroacetaldehyde
107-21-1	Ethylene glycol
107-30-2	Chloromethyl methyl ether
107-41-5	Hexylene glycol
107-49-3	Tetraethyl pyrophosphate
107-66-4	Dibutylphosphate
107-98-2	Propylene glycol monomethyl ether
108-11-2	Methyl isobutyl carbinol
108-18-9	Diisopropylamine

Table Att-I-5. Regulated Organic Compounds Without a Positive Analytical Detect in Vapor Phase (384 Compounds). (11 Sheets)

CAS #	Constituent
108-21-4	Isopropyl acetate
108-24-7	Acetic anhydride
108-31-6	Maleic anhydride (2,5-Furandione)
108-43-0	Chlorophenols
108-44-1	m-Toluidine
108-46-3	Resorcinol (1,3-Benzenediol)
108-83-8	Diisobutyl ketone
108-84-9	sec-Hexyl acetate
108-91-8	Cyclohexylamine
108-98-5	Thiophenol
109-59-1	Isopropoxyethanol
109-60-4	n-Propyl acetate
109-73-9	n-Butylamine
109-79-5	n-Butyl mercaptan
109-86-4	2-Methoxyethanol
109-87-5	Methylal
109-89-7	Diethylamine
109-94-4	Ethyl formate
110-19-0	Isobutyl acetate
110-49-6	2-Methoxyethyl acetate
110-80-5	2-Ethoxyethanol
110-91-8	Morpholine
111-15-9	2-Ethoxyethyl acetate
111-30-8	Glutaraldehyde
111-40-0	Diethylene triamine
111-42-2	Diethanolamine
111-44-4	Bis(2-chloroethyl) ether
1120-71-4	1,3-Propane sultone
114-26-1	Propoxur
115-29-7	Endosulfan
115-86-6	Triphenyl phosphate
115-90-2	Fensulfothion
117-79-3	2-Aminoanthraquinone
118-52-5	1,3-Dichloro-5,5-Dimethyl hydantoin
118-74-1	Hexachlorobenzene
118-96-7	2,4,6-Trinitrotoluene

Table Att-I-5. Regulated Organic Compounds Without a Positive Analytical Detect in Vapor Phase (384 Compounds). (11 Sheets)

CAS #	Constituent
119-90-4	3,3'-Dimethoxybenzidine
119-93-7	3,3'-Dimethylbenzidine.
120-80-9	Catechol
121-14-2	2,4-Dinitrotoluene
121-44-8	Triethylamine
121-45-9	Trimethyl phosphite
121-69-7	Dimethylaniline
121-75-5	Malathion
121-82-4	Cyclonite
122-60-1	Phenyl glycidyl ether
122-66-7	1,2-Diphenylhydrazine
123-31-9	Hydroquinone
123-42-2	Diacetone alcohol
123-92-2	Isoamyl acetate
124-40-3	Dimethylamine
126-85-2	Nitrogen mustard N-oxide
126-99-8	Chloroprene
129-15-7	2-Methyl-1-nitroanthraquinone
1300-73-8	Xylidine
131-11-3	Dimethyl phthalate
13121-70-5	Cyhexatin
132-64-9	Dibenzofuran
1321-64-8	Pentachloronaphthalene
1321-65-9	Trichloronaphthalene
1321-74-0	Divinyl benzene
133-06-2	Captan
133-90-4	Chloramben
1335-87-1	Hexachloronaphthalene
1335-88-2	Tetrachloronaphthalene
1338-23-4	Methyl ethyl ketone peroxide
134-32-7	alpha-Naphthylamine
135-20-6	Cupferron
13552-44-8	4,4-Methylenedianiline dihydrochloride
136-78-7	Sesone
137-05-3	Methyl-2-cyanoacrylate
137-26-8	Thiram

Table Att-I-5. Regulated Organic Compounds Without a Positive Analytical Detect in Vapor Phase (384 Compounds). (11 Sheets)

CAS #	Constituent
138-22-7	n-Butyl lactate
13838-16-9	Enflurane
139-65-1	4,4'-Thiodianiline
139-91-3	5-(Morpholinomethyl)-3-amino-2-oxazolidinone (furaltudone)
1395-21-7	Subtilisins
140-88-5	Ethylacrylate
141-32-2	Butylacrylate
141-43-5	Ethanolamine
141-66-2	Dicrotophos
142-64-3	Piperazine dihydrochloride
144-62-7	Oxalic acid
14484-64-1	Ferbam
1477-55-0	m-Xylene-a,a'-diamine
148-01-6	Dinitolamide
150-76-5	4-Methoxyphenol
151-56-4	Ethyleneimine
151-67-7	Halothane
1563-66-2	Carbofuran
1582-09-8	Trifluralin
1615-80-1	N,N'-Diethylhydrazine
16219-75-3	Ethylidene norbornene
1634-04-4	Methyl tert-butyl ether
16752-77-5	Methomyl
1694-09-3	Benzyl violet 4b
17804-35-2	Benomyl
1836-75-5	Nitrofen
189-55-9	Dibenzo[a,i]pyrene
189-64-0	Dibenzo[a,h]pyrene
191-30-0	Dibenzo(a,l)pyrene
1912-24-9	Atrazine
1918-02-1	Picloram
192-65-4	Dibenzo[a,e]pyrene
1929-82-4	Nitrapyrin
193-39-5	Indeno(1,2,3-cd)pyrene
2039-87-4	o-Chlorostyrene
205-82-3	Benzo[j]fluoranthene

Table Att-I-5. Regulated Organic Compounds Without a Positive Analytical Detect in Vapor Phase (384 Compounds). (11 Sheets)

CAS #	Constituent
205-99-2	Benzo(b)fluoranthene
207-08-9	Benzo(k)fluoranthene
2104-64-5	EPN
21087-64-9	Metribuzin
2179-59-1	Allyl propyl disulfide
218-01-9	Chrysene
22224-92-6	Fenamiphos
2234-13-1	Octachloronaphthalene
2238-07-5	Diglycidyl ether
224-42-0	Dibenz[a,j]acridine
226-36-8	Dibenz[a,h]acridine
2385-85-5	Mirex
2425-06-1	Captafol
2426-08-6	n-Butyl glycidyl ether
2465-27-2	Auramine (technical grade)
25013-15-4	Vinyl toluene
2551-13-7	Trimethyl benzene
25639-42-3	Methylcyclohexanol
26140-60-3	Terphenyls
2646-17-5	Oil orange SS
26952-21-6	Iso-ocytl alcohol
26952-23-8	Dichloropropene
2698-41-1	o-Chlorobenylidene malonitrile
28434-86-8	3,3'-Dichloro-4,4'-diaminodiphenyl ether
29191-52-4	Anisidine (o-,p- isomers)
2921-88-2	Chlorpyrifos
2971-90-6	Clopidol
298-00-0	Methyl parathion
298-02-2	Phorate
298-04-4	Disulfoton
299-84-3	Ronnel
299-86-5	Crufomate
300-76-5	Naled
302-01-2	Hydrazine
302-70-5	Nitrogen mustard N-oxide hydrochloride
3068-88-0	B-Butyrolactone

Table Att-I-5. Regulated Organic Compounds Without a Positive Analytical Detect in Vapor Phase (384 Compounds). (11 Sheets)

CAS #	Constituent
309-00-2	Aldrin
314-40-9	Bromacil
319-84-6	alpha-BHC
319-85-7	beta-BHC
330-54-1	Diuron
333-41-5	Diazinon
3333-52-6	Tetramethyl succinonitrile
334-88-3	Diazomethane
3383-96-8	Temephos
34590-94-8	Dipropylene glycol methyl ether
35400-43-2	Sulprofos
3547-04-4	DDE (p,p'-Dichlorodiphenyldichloroethylene)
3689-24-5	Tetraethyldithiopyrophosphate (TEDP)
3697-24-3	5-Methylchrysene
3761-53-3	Ponceau MX
3825-26-1	Ammonium perfluorooctanoate
4016-14-2	Isopropyl glycidyl ether (IGE)
4098-71-9	Isophorone diisocyanate
420-04-2	Cyanamide
463-51-4	Ketene
4685-14-7	Paraquat
479-45-8	Tetryl
50-29-3	4,4-DDT
50-32-8	Benzo(a)pyrene
504-29-0	2-Aminopyridine
509-14-8	Tetranitromethane
51-28-5	2,4-Dinitrophenol
51-79-6	Ethyl carbamate (urethane)
510-15-6	Chlorobenzilate
5124-30-1	Methylene-bis-(4-cyclo-hexylisocyanate)
528-29-0	Dinitrobenzene, all isomers
53-70-3	Dibenz[a,h]anthracene
53-96-3	2-Acetylaminofluorene
531-82-8	N-(4-(5-Nitro-2-furyl)-2-thiazolyl)acetamide
532-27-4	a-Chloroacetophenone
534-52-1	4,6-Dinitro-o-cresol

Table Att-I-5. Regulated Organic Compounds Without a Positive Analytical Detect in Vapor Phase (384 Compounds). (11 Sheets)

CAS #	Constituent
54-11-5	Nicotine
540-59-0	1,2-Dichloroethylene
540-73-8	1,2-Dimethylhydrazine
540-84-1	2,2,4-Trimethylpentane
540-88-5	tert-Butyl acetate
541-85-5	Ethyl amyl ketone
542-75-6	1,3-Dichloropropene
542-88-1	Dichloromethyl ether
542-92-7	Cyclopentadiene
55-18-5	N-Nitrosodiethylamine
55-38-9	Fenthion
55-63-0	Nitroglycerin
552-30-7	Trimellitic anhydride
555-84-9	1-(5-Nitrofurfurylidene)amino)-2-imidazolidinone
556-52-5	Glycidol
55720-99-5	Chlorinated diphenyl oxide
55738-54-0	trans-2((Dimethylamino)methylimino)-5-(2-(5-nitro-2-furyl) vinyl-1,3,4-oxadiazole
56-38-2	Parathion
56-55-3	Benzo(a)anthracene
563-12-2	Ethion
57-24-9	Strychnine
57-57-8	B-Propiolactone
57-74-9	Chlordane
57-97-6	7,12-Dimethylbenz[a]anthracene
58-89-9	gamma-BHC (Lindane)
583-60-8	o-Methylcyclohexanone
584-84-9	2,4-Toluene diisocyanate
59-87-0	Nitrofurazone
592-62-1	Methyl azoxymethyl acetate
593-60-2	Vinyl bromide
59355-75-8	Methyl acetylene-propadiene mixture (MAPP)
594-42-3	Perchloromethyl mercaptan
594-72-9	1,1-Dichloro-1-nitroethane
60-11-7	p-Dimethylaminoazobenzene
60-29-7	Ethyl ether
60-57-1	Dieldrin

Table Att-I-5. Regulated Organic Compounds Without a Positive Analytical Detect in Vapor Phase (384 Compounds). (11 Sheets)

CAS #	Constituent
600-25-9	1-Chloro-1-nitropropane
602-87-9	5-Nitroacenaphthene
603-34-9	Triphenyl amine
61-82-5	Amitrole
613-35-4	N,N-Diacetylbenzidine
615-53-2	N-Nitroso-N-methylurethane
62-53-3	Aniline
62-73-7	Dichlorvas
626-17-5	m-Phthalodinitrile
626-38-0	sec-Amyl acetate
628-63-7	n-Amyl acetate
628-96-6	Ethylene glycol dinitrate
63-25-2	Carbaryl
63-92-3	Phenoxybenzamine hydrochloride
636-21-5	o-Toluidine hydrochloride
638-21-1	Phenylphosphine
64-18-6	Formic acid
64-67-5	Diethyl sulfate
64091-91-4	4-(Methylnitrosamino)-1-(3-pyridyl)-1-butanone
6423-43-4	Propylene glycol dinitrate
67-45-8	Furazolidone
67-72-1	Hexachloroethane
68-11-1	Thioglycolic acid
680-31-9	Hexamethylphosphoramide
681-84-5	Methyl silicate
684-16-2	Hexafluoroacetone
684-93-5	N-Nitroso-N-methylurea
68476-85-7	Liquified petroleum gas
6923-22-4	Monocrotophos
696-28-6	Dichlorophenylarsine
72-20-8	Endrin
72-43-5	Methoxychlor
74-88-4	Iodomethane
74-89-5	Methylamine
74-93-1	Thiomethanol
74-96-4	Ethyl bromide

Table Att-I-5. Regulated Organic Compounds Without a Positive Analytical Detect in Vapor Phase (384 Compounds). (11 Sheets)

CAS #	Constituent
74-97-5	Bromochloromethane
75-04-7	Ethylamine
75-08-1	Ethyl mercaptan
75-25-2	Tribromomethane
75-31-0	Isopropylamine
75-47-8	Iodoform
75-56-9	Propylene oxide
75-61-6	Difluorodibromomethane
75-63-8	Trifluorobromomethane
75-99-0	2,2-Dichloropropionic acid
7572-29-4	Dichloroacetylene
759-73-9	N-Nitroso-N-ethylurea
76-03-9	Trichloroacetic acid
76-06-2	Chloropicrin
76-11-9	1,1,1,2-Tetrachloro-2,2-difluoroethane
76-12-0	1,1,2,2-Tetrachloro-1,2-difluoroethane
76-15-3	Chloropentafluoroethane
76-22-2	Camphor, synthetic
76-44-8	Heptachlor
764-41-0	1,4-Dichloro-2-butene
765-34-4	Glycidylaldehyde
768-52-5	N-Isopropylaniline
77-47-4	Hexachlorocyclopentadiene
77-73-6	Dicyclopentadiene
77-78-1	Dimethyl sulfate
7782-41-4	Fluorine
7786-34-7	Mevinphos
78-10-4	Ethyl silicate
78-30-8	Triorthocresyl phosphate
78-34-2	Dioxathion
78-59-1	Isophorone
7803-51-2	Phosphine
79-04-9	Chloroacetyl chloride
79-06-1	Acrylamide
79-11-8	Chloroacetic acid
79-24-3	Nitroethane

Table Att-I-5. Regulated Organic Compounds Without a Positive Analytical Detect in Vapor Phase (384 Compounds). (11 Sheets)

CAS #	Constituent
79-27-6	Acetylene tetrabromide
79-41-4	Methacrylic acid
79-44-7	Dimethylcarbamoyl chloride
79-46-9	2-Nitropropane
794-93-4	Panfuran S (dihydroxymethylfuratrizine)
80-62-6	Methyl methacrylate
8001-35-2	Toxaphene
8001-58-9	Creosote
8003-34-7	Pyrethrum
8006-64-2	Turpentine
8022-00-2	Methyl demeton
8052-42-4	Asphalt (petroleum) fumes
8065-48-3	Demeton
81-81-2	Warfarin (>0.3%)
82-68-8	Pentachloronitrobenzene (PCNB)
822-06-0	Hexamethylene diisocyanate
83-26-1	Pindone
83-79-4	Rotenone
838-88-0	4,4'-Methylenebis(2-methylaniline)
85-00-7	Diquat
85-44-9	Phthalic anhydride
86-30-6	N-Nitrosodiphenylamine
86-50-0	Azinphos-methyl
86-88-4	alpha-Naphthylthiourea
87-86-5	Pentachlorophenol
88-06-2	2,4,6-Trichlorophenol
88-72-2	Nitrotoluene
88-89-1	Picric acid
89-72-5	o-sec-Butylphenol
90-04-0	o-Anisidine
91-22-5	Quinoline
91-94-1	3,3 –Dichlorobenzidine
92-67-1	4-Aminobiphenyl
92-84-2	Phenothiazine
92-87-5	Benzidine
92-93-3	4-Nitrobiphenyl

Table Att-I-5. Regulated Organic Compounds Without a Positive Analytical Detect in Vapor Phase (384 Compounds). (11 Sheets)

CAS #	Constituent
924-16-3	N-Nitrosodi-n-butylamine
93-76-5	2,4,5-T
94-36-0	Benzoyl Peroxide
94-75-7	2,4-D
944-22-9	Fonofos
95-13-6	Indene
95-49-8	o-Chlorotoluene
95-53-4	o-Toluidine (2-methylaniline)
95-80-7	Toluene-2,4-diamine
95-95-4	2,4,5-Trichlorophenol
96-09-3	Styrene oxide
96-12-8	1,2-Dibromo-3-chloropropane
96-18-4	1,2,3-Trichloropropane
96-33-3	Methyl acrylate
96-45-7	Ethylenethiourea
96-69-5	Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl) sulfide
97-56-3	o-Aminoazotoluene
97-77-8	Disulfiram
98-00-0	Furfuryl alcohol
98-01-1	Furfural
98-07-7	Benzotrichloride
98-51-1	p-tert-Butyltoluene
98-82-2	Cumene
999-61-1	2-Hydroxypropyl acrylate

CAS # = chemical abstract services number.

Table Att-I-6. Regulated Pesticides and Herbicides Possibly Used at Hanford (27 Compounds).

CAS #	Constituent
118-74-1	Hexachlorobenzene
133-06-2	Captan
133-90-4	Chloramben
1582-09-8	Trifluralin
1836-75-5	Nitrofen
1918-02-1	Picloram
2234-13-1	Octachloronaphthalene
2385-85-5	Mirex
2425-06-1	Captafol
309-00-2	Aldrin
319-84-6	alpha-BHC
319-85-7	beta-BHC
50-29-3	4,4-DDT
510-15-6	Chlorobenzilate
57-74-9	Chlordane
58-89-9	gamma-BHC (Lindane)
60-57-1	Dieldrin
72-20-8	Endrin
72-43-5	Methoxychlor
75-99-0	2,2-Dichloropropionic acid
76-44-8	Heptachlor
77-47-4	Hexachlorocyclopentadiene
8001-35-2	Toxaphene
87-86-5	Pentachlorophenol
93-76-5	2,4,5-T
94-75-7	2,4-D
96-12-8	1,2-Dibromo-3-chloropropane

CAS # = chemical abstract services number.

Table Att-I-7. Regulated Compounds Listed in Hanford Inventory Reports (9 Compounds).

CAS #	Constituent	Klem[1] (total)	HTCE[2] (Agnew)	Campbell et al.[3]
107-21-1	Ethylene glycol	X		
107-66-4	Dibutylphosphate	X	X	
110-91-8	Morpholine	X		
123-92-2	Isoamyl acetate	X		
134-32-7	alpha-Naphthylamine	X		
144-62-7	Oxalic acid	X	X	X
302-01-2	Hydrazine	X		
60-29-7	Ethyl ether	X		
64-18-6	Formic acid			X

[1]Klem, M.J., 1990, *Inventory of Chemicals Used at Hanford Site Production Plants and Support Operations (1944-198)*, WHC-EP-0172, Rev. 1, Westinghouse Hanford Company, Richland, Washington.

[2]Agnew, S.M., 1997, *Hanford Tank chemical and Radionuclide Inventories: HDW Model*, LA-UR-96-3860, Rev. 4, Los Alamos National Laboratory, Los Alamos, New Mexico.

[3]Campbell, J.A., K.L. Wahl, S.A. Clauss, K.E. Grant, V. Hoopes, G.M. Mong, J. Rau, and R. Steele, 1996, *Organic Tanks Safety Program: Advanced Organic Analysis FY 1996 Progress Report*, PNNL-11309, Pacific Northwest National Laboratory, Richland, Washington.

CAS # = chemical abstract services number.
HTCE = Historical Tank Content Estimate.

Table Att-I-8. Regulated Non-detected Organic Compounds Used in Industries Potentially Unrelated to Hanford Activities (157 Compounds). (7 Sheets)

CAS #	Constituent	Independent Review	Pesticide	Military	Dyestuff	Pharma-ceutical	Solvent	Consumer	Group/ Mixture	Polymer
100-01-6	4-Nitroaniline	X								
100-44-7	Benzyl chloride	X								
101-14-4	4,4'-Methylenebis(2-chloroaniline)	X								
101-77-9	4,4-Methylene dianiline	X								X
101-80-4	4,4'-Diaminodiphenyl ether	X			X					
105-60-2	Caprolactam, vapor	X						X		
105-60-2a	Caprolactam, dust	X						X		
10595-95-6	N-Nitrosomethylethylamine	X								
106-49-0	p-Toluidine	X								
106-51-4	p-Benzoquinone	X								
106-89-8	Epichlorohydrin	X					X			
107-19-7	Propargyl alcohol	X								
107-20-0	Chloroacetaldehyde	X								
107-30-2	Chloromethyl methyl ether	X								
107-41-5	Hexylene glycol	X						X		
107-49-3	Tetraethyl pyrophosphate	X								
108-31-6	Maleic anhydride (2,5-Furandione)	X								
108-44-1	m-Toluidine	X								X
108-46-3	Resorcinol (1,3-Benzenediol)	X								
108-98-5	Thiophenol	X								
109-87-5	Methylal	X						X		
110-80-5	2-Ethoxyethanol	X								
111-30-8	Glutaraldehyde	X				X				
1120-71-4	1,3-Propane sultone	X								
114-26-1	Propoxur	X	X							

Table Att-I-8. Regulated Non-detected Organic Compounds Used in Industries Potentially Unrelated to Hanford Activities (157 Compounds). (7 Sheets)

CAS #	Constituent	Independent Review	Pesticide	Military	Dyestuff	Pharma-ceutical	Solvent	Consumer	Group/ Mixture	Polymer
115-29-7	Endosulfan	X	X							
115-90-2	Fensulfothion	X	X							
117-79-3	2-Aminoanthraquinone				X					
118-96-7	2,4,6-Trinitrotoluene	X		X						
119-90-4	3,3'-Dimethoxybenzidine	X			X					
119-93-7	3,3'-Dimethylbenzidine.	X			X					
120-80-9	Catechol	X				X				
121-14-2	2,4-Dinitrotoluene	X								
121-75-5	Malathion	X	X							
121-82-4	Cyclonite	X		X						
126-85-2	Nitrogen mustard N-oxide	X		X						
126-99-8	Chloroprene	X								
1300-73-8	Xylidine	X		X	X					
13121-70-5	Cyhexatin	X	X							
13552-44-8	4,4-Methylenedianiline dihydrochloride	X								X
136-78-7	Sesone	X	X							
137-26-8	Thiram	X				X				
13838-16-9	Enflurane	X				X				
139-91-3	5-(Morpholinomethyl)-3-amino-2-oxazolidinone (furaltudone)	X				X				
1395-21-7	Subtilisins								X	
141-66-2	Dicrotophos	X	X							
14484-64-1	Ferbam	X	X							
1477-55-0	m-Xylene-a,a'-diamine	X								X
151-56-4	Ethyleneimine	X								

Table Att-I-8. Regulated Non-detected Organic Compounds Used in Industries Potentially Unrelated to Hanford Activities (157 Compounds). (7 Sheets)

CAS #	Constituent	Independent Review	Pesticide	Military	Dyestuff	Pharma-ceutical	Solvent	Consumer	Group/ Mixture	Polymer
151-67-7	Halothane	X						X		
1563-66-2	Carbofuran	X	X							
1615-80-1	N,N'-Diethylhydrazine	X								
16752-77-5	Methomyl	X	X							
1694-09-3	Benzyl violet 4b	X			X					
17804-35-2	Benomyl	X	X							
1912-24-9	Atrazine	X	X							
1929-82-4	Nitrapyrin	X	X							
2104-64-5	EPN	X	X							
21087-64-9	Metribuzin	X	X							
2179-59-1	Allyl propyl disulfide	X						X		
22224-92-6	Fenamiphos	X	X							
2465-27-2	Auramine (technical grade)	X			X					
2646-17-5	Oil orange SS	X			X					
28434-86-8	3,3'-Dichloro-4,4'-diaminodiphenyl ether	X			X					
29191-52-4	Anisidine (o-,p- isomers)	X			X					
2971-90-6	Clopidol	X	X							
298-00-0	Methyl parathion	X	X							
298-02-2	Phorate	X	X							
298-04-4	Disulfoton	X	X							
299-84-3	Ronnel	X	X							
299-86-5	Crufomate	X	X							
300-76-5	Naled	X	X							
302-70-5	Nitrogen mustard N-oxide hydrochloride	X		X						
333-41-5	Diazinon	X	X							

Table Att-I-8. Regulated Non-detected Organic Compounds Used in Industries Potentially Unrelated to Hanford Activities (157 Compounds). (7 Sheets)

CAS #	Constituent	Independent Review	Pesticide	Military	Dyestuff	Pharma-ceutical	Solvent	Consumer	Group/ Mixture	Polymer
3383-96-8	Temephos	X	X							
35400-43-2	Sulprofos	X	X							
3547-04-4	DDE (p,p'-Dichlorodiphenyldichloroethylene)	X	X							
3689-24-5	Tetraethyldithiopyrophosphate (TEDP)	X	X							
3761-53-3	Ponceau MX	X			X					
4685-14-7	Paraquat	X	X							
479-45-8	Tetryl	X		X						
509-14-8	Tetranitromethane	X		X						
51-79-6	Ethyl carbamate (urethane)	X								
528-29-0	Dinitrobenzene, all isomers								X	
53-96-3	2-Acetylaminofluorene	X								
532-27-4	a-Chloroacetophenone	X		X						
534-52-1	4,6-Dinitro-o-cresol	X								
54-11-5	Nicotine	X				X				
540-73-8	1,2-Dimethylhydrazine	X								
542-88-1	Dichloromethyl ether	X								
55-18-5	N-Nitrosodiethylamine	X								
55-38-9	Fenthion	X	X							
55-63-0	Nitroglycerin	X		X						
555-84-9	1-(5-Nitrofurfurylidene)amino)-2-imidazolidinone	X	X							
55720-99-5	Chlorinated diphenyl oxide								X	
56-38-2	Parathion	X	X							
563-12-2	Ethion	X	X							

Table Att-I-8. Regulated Non-detected Organic Compounds Used in Industries Potentially Unrelated to Hanford Activities (157 Compounds). (7 Sheets)

CAS #	Constituent	Independent Review	Pesticide	Military	Dyestuff	Pharma-ceutical	Solvent	Consumer	Group/ Mixture	Polymer
57-24-9	Strychnine	X	X							
59-87-0	Nitrofurazone	X				X				
59355-75-8	Methyl acetylene-propadiene mixture (MAPP)								X	
60-11-7	p-Dimethylaminoazobenzene	X								
61-82-5	Amitrole	X	X							
615-53-2	N-Nitroso-N-methylurethane	X								
62-73-7	Dichlorvas	X	X							
63-25-2	Carbaryl	X	X							
636-21-5	o-Toluidine hydrochloride	X			X					
6423-43-4	Propylene glycol dinitrate	X		X						
67-45-8	Furazolidone	X				X				
680-31-9	Hexamethylphosphoramide	X	X							
684-93-5	N-Nitroso-N-methylurea	X								
68476-85-7	Liquified petroleum gas								X	
6923-22-4	Monocrotophos	X	X							
696-28-6	Dichlorophenylarsine	X								
74-88-4	Iodomethane	X								
74-93-1	Thiomethanol	X								
75-47-8	Iodoform	X				X				
759-73-9	N-Nitroso-N-ethylurea	X								
76-06-2	Chloropicrin	X		X						
76-22-2	Camphor, synthetic	X						X		
764-41-0	1,4-Dichloro-2-butene	X								
765-34-4	Glycidylaldehyde	X								

Table Att-I-8. Regulated Non-detected Organic Compounds Used in Industries Potentially Unrelated to Hanford Activities (157 Compounds). (7 Sheets)

CAS #	Constituent	Independent Review	Pesticide	Military	Dyestuff	Pharma-ceutical	Solvent	Consumer	Group/ Mixture	Polymer
77-78-1	Dimethyl sulfate	X								
7782-41-4	Fluorine	X								
7786-34-7	Mevinphos	X	X							
78-30-8	Triorthocresyl phosphate	X	X							
78-34-2	Dioxathion	X	X							
7803-51-2	Phosphine	X				X				
79-06-1	Acrylamide	X								
79-44-7	Dimethylcarbamoyl chloride	X								
79-46-9	2-Nitropropane	X								
80-62-6	Methyl methacrylate	X								
8001-58-9	Creosote	X								
8006-64-2	Turpentine								X	
8022-00-2	Methyl demeton	X	X							
8052-42-4	Asphalt (petroleum) fumes								X	
8065-48-3	Demeton	X	X							
81-81-2	Warfarin (>0.3%)	X	X							
83-26-1	Pindone	X	X							
83-79-4	Rotenone	X	X							
838-88-0	4,4'-Methylenebis(2-methylaniline)	X								X
85-00-7	Diquat	X	X							
85-44-9	Phthalic anhydride	X								
86-50-0	Azinphos-methyl	X	X							
86-88-4	alpha-Naphthylthiourea	X								
90-04-0	o-Anisidine	X			X					
91-94-1	3,3 –Dichlorobenzidine	X			X					

Table Att-I-8. Regulated Non-detected Organic Compounds Used in Industries Potentially Unrelated to Hanford Activities (157 Compounds). (7 Sheets)

CAS #	Constituent	Independent Review	Pesticide	Military	Dyestuff	Pharma-ceutical	Solvent	Consumer	Group/ Mixture	Polymer
92-67-1	4-Aminobiphenyl	X								
92-84-2	Phenothiazine	X	X							
92-87-5	Benzidine	X			X					
924-16-3	N-Nitrosodi-n-butylamine	X								
944-22-9	Fonofos	X	X							
95-53-4	o-Toluidine (2-methylaniline)	X								
95-80-7	Toluene-2,4-diamine	X								
96-18-4	1,2,3-Trichloropropane	X								
96-45-7	Ethylenethiourea	X								
97-77-8	Disulfiram					X				
98-07-7	Benzotrichloride	X								

CAS # = chemical abstract services number.

Table Att-I-9. Regulated Non-detected Organic Compounds Used in Industries Potentially Unrelated to Hanford Activities (Professional Judgement) (5 Compounds).

CAS #	Constituent	Pesticide/ Fungicide	Dyestuff	Pharma-ceutical	Polymer
121-44-8	Triethylamine			X	
129-15-7	2-Methyl-1-nitroanthraquinone		X		
1321-74-0	Divinyl benzene				X
142-64-3	Piperazine dihydrochloride	X			
62-53-3	Aniline		X		

CAS # = chemical abstract services number.

Table Att-I-10. Regulated Non-detected Organic Compounds Considered for Stability and Volatility Evaluation (222 Compounds). (6 Sheets)

CAS #	Constituent
100-02-7	4-Nitrophenol
100-37-8	Diethylaminoethanol
100-61-8	N-Methylbenzenamine
100-63-0	Phenylhydrazine
100-74-3	N-Ethylmorpholine
101-68-8	Methylene bis(phenyl isocyanate)
101-90-6	Diglycidyl resorcinol ether
102-81-8	2-N-Dibutylaminoethanol
105-46-4	sec-Butyl acetate
106-44-5	4-Methylphenol
106-50-3	p-Phenylenediamine
106-87-6	Vinyl cyclohexene dioxide
106-92-3	Allyl glycidyl ether
107-07-3	Ethylene chlorohydrin
107-15-3	Ethylene diamine
107-21-1	Ethylene glycol
107-66-4	Dibutylphosphate
107-98-2	Propylene glycol monomethyl ether
108-11-2	Methyl isobutyl carbinol
108-18-9	Diisopropylamine
108-21-4	Isopropyl acetate
108-24-7	Acetic anhydride
108-43-0	Chlorophenols
108-83-8	Diisobutyl ketone
108-84-9	sec-Hexyl acetate
108-91-8	Cyclohexylamine
109-59-1	Isopropoxyethanol

Table Att-I-10. Regulated Non-detected Organic Compounds Considered for Stability and Volatility Evaluation (222 Compounds). (6 Sheets)

CAS #	Constituent
109-60-4	n-Propyl acetate
109-73-9	n-Butylamine
109-79-5	n-Butyl mercaptan
109-86-4	2-Methoxyethanol
109-89-7	Diethylamine
109-94-4	Ethyl formate
110-19-0	Isobutyl acetate
110-49-6	2-Methoxyethyl acetate
110-91-8	Morpholine
111-15-9	2-Ethoxyethyl acetate
111-40-0	Diethylene triamine
111-42-2	Diethanolamine
111-44-4	Bis(2-chloroethyl) ether
115-86-6	Triphenyl phosphate
118-52-5	1,3-Dichloro-5,5-Dimethyl hydantoin
118-74-1	Hexachlorobenzene
121-45-9	Trimethyl phosphite
121-69-7	Dimethylaniline
122-60-1	Phenyl glycidyl ether
122-66-7	1,2-Diphenylhydrazine
123-31-9	Hydroquinone
123-42-2	Diacetone alcohol
123-92-2	Isoamyl acetate
124-40-3	Dimethylamine
131-11-3	Dimethyl phthalate
132-64-9	Dibenzofuran
1321-64-8	Pentachloronaphthalene
1321-65-9	Trichloronaphthalene
133-06-2	Captan
133-90-4	Chloramben
1335-87-1	Hexachloronaphthalene
1335-88-2	Tetrachloronaphthalene
1338-23-4	Methyl ethyl ketone peroxide
134-32-7	alpha-Naphthylamine
135-20-6	Cupferron
137-05-3	Methyl-2-cyanoacrylate
138-22-7	n-Butyl lactate
139-65-1	4,4'-Thiodianiline
140-88-5	Ethylacrylate
141-32-2	Butylacrylate
141-43-5	Ethanolamine
144-62-7	Oxalic acid

Table Att-I-10. Regulated Non-detected Organic Compounds Considered for Stability and Volatility Evaluation (222 Compounds). (6 Sheets)

CAS #	Constituent
148-01-6	Dinitolamide
150-76-5	4-Methoxyphenol
1582-09-8	Trifluralin
16219-75-3	Ethylidene norbornene
1634-04-4	Methyl tert-butyl ether
1836-75-5	Nitrofen
189-55-9	Dibenzo[a,i]pyrene
189-64-0	Dibenzo[a,h]pyrene
191-30-0	Dibenzo(a,l)pyrene
1918-02-1	Picloram
192-65-4	Dibenzo[a,e]pyrene
193-39-5	Indeno(1,2,3-cd)pyrene
2039-87-4	o-Chlorostyrene
205-82-3	Benzo[j]fluoranthene
205-99-2	Benzo(b)fluoranthene
207-08-9	Benzo(k)fluoranthene
218-01-9	Chrysene
2234-13-1	Octachloronaphthalene
2238-07-5	Diglycidyl ether
224-42-0	Dibenz[a,j]acridine
226-36-8	Dibenz[a,h]acridine
2385-85-5	Mirex
2425-06-1	Captafol
2426-08-6	n-Butyl glycidyl ether
25013-15-4	Vinyl toluene
2551-13-7	Trimethyl benzene
25639-42-3	Methylcyclohexanol
26140-60-3	Terphenyls
26952-21-6	Iso-ocytl alcohol
26952-23-8	Dichloropropene
2698-41-1	o-Chlorobenylidene malonitrile
2921-88-2	Chlorpyrifos
302-01-2	Hydrazine
3068-88-0	B-Butyrolactone
309-00-2	Aldrin
314-40-9	Bromacil
319-84-6	alpha-BHC
319-85-7	beta-BHC
330-54-1	Diuron
3333-52-6	Tetramethyl succinonitrile
334-88-3	Diazomethane
34590-94-8	Dipropylene glycol methyl ether

Table Att-I-10. Regulated Non-detected Organic Compounds Considered for Stability and Volatility Evaluation (222 Compounds). (6 Sheets)

CAS #	Constituent
3697-24-3	5-Methylchrysene
3825-26-1	Ammonium perfluorooctanoate
4016-14-2	Isopropyl glycidyl ether (IGE)
4098-71-9	Isophorone diisocyanate
420-04-2	Cyanamide
463-51-4	Ketene
50-29-3	4,4-DDT
50-32-8	Benzo(a)pyrene
504-29-0	2-Aminopyridine
51-28-5	2,4-Dinitrophenol
510-15-6	Chlorobenzilate
5124-30-1	Methylene-bis-(4-cyclo-hexylisocyanate)
53-70-3	Dibenz[a,h]anthracene
531-82-8	N-(4-(5-Nitro-2-furyl)-2-thiazolyl)acetamide
540-59-0	1,2-Dichloroethylene
540-84-1	2,2,4-Trimethylpentane
540-88-5	tert-Butyl acetate
541-85-5	Ethyl amyl ketone
542-75-6	1,3-Dichloropropene
542-92-7	Cyclopentadiene
552-30-7	Trimellitic anhydride
556-52-5	Glycidol
55738-54-0	trans-2((Dimethylamino)methylimino)-5-(2-(5-nitro-2-furyl) vinyl-1,3,4-oxadiazole
56-55-3	Benzo(a)anthracene
57-57-8	B-Propiolactone
57-74-9	Chlordane
57-97-6	7,12-Dimethylbenz[a]anthracene
58-89-9	gamma-BHC (Lindane)
583-60-8	o-Methylcyclohexanone
584-84-9	2,4-Toluene diisocyanate
592-62-1	Methyl azoxymethyl acetate
593-60-2	Vinyl bromide
594-42-3	Perchloromethyl mercaptan
594-72-9	1,1-Dichloro-1-nitroethane
60-29-7	Ethyl ether
60-57-1	Dieldrin
600-25-9	1-Chloro-1-nitropropane
602-87-9	5-Nitroacenaphthene
603-34-9	Triphenyl amine
613-35-4	N,N-Diacetylbenzidine
626-17-5	m-Phthalodinitrile
626-38-0	sec-Amyl acetate

Table Att-I-10. Regulated Non-detected Organic Compounds Considered for Stability and Volatility Evaluation (222 Compounds). (6 Sheets)

CAS #	Constituent
628-63-7	n-Amyl acetate
628-96-6	Ethylene glycol dinitrate
63-92-3	Phenoxybenzamine hydrochloride
638-21-1	Phenylphosphine
64-18-6	Formic acid
64-67-5	Diethyl sulfate
64091-91-4	4-(Methylnitrosamino)-1-(3-pyridyl)-1-butanone
67-72-1	Hexachloroethane
68-11-1	Thioglycolic acid
681-84-5	Methyl silicate
684-16-2	Hexafluoroacetone
72-20-8	Endrin
72-43-5	Methoxychlor
74-89-5	Methylamine
74-96-4	Ethyl bromide
74-97-5	Bromochloromethane
75-04-7	Ethylamine
75-08-1	Ethyl mercaptan
75-25-2	Tribromomethane
75-31-0	Isopropylamine
75-56-9	Propylene oxide
75-61-6	Difluorodibromomethane
75-63-8	Trifluorobromomethane
75-99-0	2,2-Dichloropropionic acid
7572-29-4	Dichloroacetylene
76-03-9	Trichloroacetic acid
76-11-9	1,1,1,2-Tetrachloro-2,2-difluoroethane
76-12-0	1,1,2,2-Tetrachloro-1,2-difluoroethane
76-15-3	Chloropentafluoroethane
76-44-8	Heptachlor
768-52-5	N-Isopropylaniline
77-47-4	Hexachlorocyclopentadiene
77-73-6	Dicyclopentadiene
78-10-4	Ethyl silicate
78-59-1	Isophorone
79-04-9	Chloroacetyl chloride
79-11-8	Chloroacetic acid
79-24-3	Nitroethane
79-27-6	Acetylene tetrabromide
79-41-4	Methacrylic acid
794-93-4	Panfuran S (dihydroxymethylfuratrizine)
8001-35-2	Toxaphene

Table Att-I-10. Regulated Non-detected Organic Compounds Considered for Stability and Volatility Evaluation (222 Compounds). (6 Sheets)

CAS #	Constituent
8003-34-7	Pyrethrum
82-68-8	Pentachloronitrobenzene (PCNB)
822-06-0	Hexamethylene diisocyanate
86-30-6	N-Nitrosodiphenylamine
87-86-5	Pentachlorophenol
88-06-2	2,4,6-Trichlorophenol
88-72-2	Nitrotoluene
88-89-1	Picric acid
89-72-5	o-sec-Butylphenol
91-22-5	Quinoline
92-93-3	4-Nitrobiphenyl
93-76-5	2,4,5-T
94-36-0	Benzoyl Peroxide
94-75-7	2,4-D
95-13-6	Indene
95-49-8	o-Chlorotoluene
95-95-4	2,4,5-Trichlorophenol
96-09-3	Styrene oxide
96-12-8	1,2-Dibromo-3-chloropropane
96-33-3	Methyl acrylate
96-69-5	Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl) sulfide
97-56-3	o-Aminoazotoluene
98-00-0	Furfuryl alcohol
98-01-1	Furfural
98-51-1	p-tert-Butyltoluene
98-82-2	Cumene
999-61-1	2-Hydroxypropyl acrylate

CAS # = chemical abstract services number.

Table Att-I-11. Regulated Organic Non-detected Compound Considered Unstable in Vapor Phase (1 Compound).

CAS #	Constituent	Comment
110-91-8	Morpholine	Moisture sensitive

CAS # = chemical abstract services number.

Table Att-I-12. Regulated Organic Non-detected Compounds Considered Unlikely to be Present in Vapor Phase, Based on Huckaby et al. (1996)* (12 Compounds).

CAS #	Constituent	Code	Comment
107-66-4	Dibutylphosphate	i3	nonvolatile
108-24-7	Acetic anhydride	i5	not stable in water or moisture sensitive
118-52-5	1,3-Dichloro-5,5-Dimethyl hydantoin	i5	not stable in water or moisture sensitive
2426-08-6	n-Butyl glycidyl ether	i5	not stable in water or moisture sensitive
330-54-1	Diuron	i3	nonvolatile
334-88-3	Diazomethane	i8	unstable
463-51-4	Ketene	i8	unstable
552-30-7	Trimellitic anhydride	i5	not stable in water or moisture sensitive
613-35-4	N,N-Diacetylbenzidine	i3	nonvolatile
638-21-1	Phenylphosphine	i8	unstable
75-99-0	2,2-Dichloropropionic acid	i5	not stable in water or moisture sensitive
94-36-0	Benzoyl Peroxide	i3	nonvolatile

*Huckaby, J.L., J.A. Glissmeyer, J.E. Meacham, and L.A. Stauffer, 1996, *Comparison of Organic Constituents Found in the Condensed and Vapor Phases of Tanks 241-BY-108, 241-BY-110, and 241-C-102*, WHC-EP-0919, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

CAS # = chemical abstract services number.

Table AI-13. Regulated Organic Non-detected Compounds Evaluated for Volatility (209 Compounds). (7 Sheets)

CAS #	Constituent
100-02-7	4-Nitrophenol
100-37-8	Diethylaminoethanol
100-61-8	N-Methylbenzenamine
100-63-0	Phenylhydrazine
100-74-3	N-Ethylmorpholine
101-68-8	Methylene bis(phenyl isocyanate)
101-90-6	Diglycidyl resorcinol ether
102-81-8	2-N-Dibutylaminoethanol
105-46-4	sec-Butyl acetate
106-44-5	4-Methylphenol
106-50-3	p-Phenylenediamine
106-87-6	Vinyl cyclohexene dioxide
106-92-3	Allyl glycidyl ether
107-07-3	Ethylene chlorohydrin
107-15-3	Ethylene diamine
107-21-1	Ethylene glycol
107-98-2	Propylene glycol monomethyl ether
108-11-2	Methyl isobutyl carbinol
108-18-9	Diisopropylamine
108-21-4	Isopropyl acetate
108-43-0	Chlorophenols
108-83-8	Diisobutyl ketone
108-84-9	sec-Hexyl acetate
108-91-8	Cyclohexylamine
109-59-1	Isopropoxyethanol
109-60-4	n-Propyl acetate
109-73-9	n-Butylamine
109-79-5	n-Butyl mercaptan
109-86-4	2-Methoxyethanol
109-89-7	Diethylamine
109-94-4	Ethyl formate
110-19-0	Isobutyl acetate
110-49-6	2-Methoxyethyl acetate
111-15-9	2-Ethoxyethyl acetate
111-40-0	Diethylene triamine
111-42-2	Diethanolamine

Table AI-13. Regulated Organic Non-detected Compounds Evaluated for Volatility (209 Compounds). (7 Sheets)

CAS #	Constituent
111-44-4	Bis(2-chloroethyl) ether
115-86-6	Triphenyl phosphate
118-74-1	Hexachlorobenzene
121-45-9	Trimethyl phosphite
121-69-7	Dimethylaniline
122-60-1	Phenyl glycidyl ether
122-66-7	1,2-Diphenylhydrazine
123-31-9	Hydroquinone
123-42-2	Diacetone alcohol
123-92-2	Isoamyl acetate
124-40-3	Dimethylamine
131-11-3	Dimethyl phthalate
132-64-9	Dibenzofuran
1321-64-8	Pentachloronaphthalene
1321-65-9	Trichloronaphthalene
133-06-2	Captan
133-90-4	Chloramben
1335-87-1	Hexachloronaphthalene
1335-88-2	Tetrachloronaphthalene
1338-23-4	Methyl ethyl ketone peroxide
134-32-7	alpha-Naphthylamine
135-20-6	Cupferron
137-05-3	Methyl-2-cyanoacrylate
138-22-7	n-Butyl lactate
139-65-1	4,4'-Thiodianiline
140-88-5	Ethylacrylate
141-32-2	Butylacrylate
141-43-5	Ethanolamine
144-62-7	Oxalic acid
148-01-6	Dinitolamide
150-76-5	4-Methoxyphenol
1582-09-8	Trifluralin
16219-75-3	Ethylidene norbornene
1634-04-4	Methyl tert-butyl ether
1836-75-5	Nitrofen
189-55-9	Dibenzo[a,i]pyrene

Table AI-13. Regulated Organic Non-detected Compounds Evaluated for Volatility (209 Compounds). (7 Sheets)

CAS #	Constituent
189-64-0	Dibenzo[a,h]pyrene
191-30-0	Dibenzo(a,l)pyrene
1918-02-1	Picloram
192-65-4	Dibenzo[a,e]pyrene
193-39-5	Indeno(1,2,3-cd)pyrene
2039-87-4	o-Chlorostyrene
205-82-3	Benzo[j]fluoranthene
205-99-2	Benzo(b)fluoranthene
207-08-9	Benzo(k)fluoranthene
218-01-9	Chrysene
2234-13-1	Octachloronaphthalene
2238-07-5	Diglycidyl ether
224-42-0	Dibenz[a,j]acridine
226-36-8	Dibenz[a,h]acridine
2385-85-5	Mirex
2425-06-1	Captafol
25013-15-4	Vinyl toluene
2551-13-7	Trimethyl benzene
25639-42-3	Methylcyclohexanol
26140-60-3	Terphenyls
26952-21-6	Iso-ocytl alcohol
26952-23-8	Dichloropropene
2698-41-1	o-Chlorobenylidene malonitrile
2921-88-2	Chlorpyrifos
302-01-2	Hydrazine
3068-88-0	B-Butyrolactone
309-00-2	Aldrin
314-40-9	Bromacil
319-84-6	alpha-BHC
319-85-7	beta-BHC
3333-52-6	Tetramethyl succinonitrile
34590-94-8	Dipropylene glycol methyl ether
3697-24-3	5-Methylchrysene
3825-26-1	Ammonium perfluorooctanoate
4016-14-2	Isopropyl glycidyl ether (IGE)
4098-71-9	Isophorone diisocyanate

Table AI-13. Regulated Organic Non-detected Compounds Evaluated for Volatility (209 Compounds). (7 Sheets)

CAS #	Constituent
420-04-2	Cyanamide
50-29-3	4,4-DDT
50-32-8	Benzo(a)pyrene
504-29-0	2-Aminopyridine
51-28-5	2,4-Dinitrophenol
510-15-6	Chlorobenzilate
5124-30-1	Methylene-bis-(4-cyclo-hexylisocyanate)
53-70-3	Dibenz[a,h]anthracene
531-82-8	N-(4-(5-Nitro-2-furyl)-2-thiazolyl)acetamide
540-59-0	1,2-Dichloroethylene
540-84-1	2,2,4-Trimethylpentane
540-88-5	tert-Butyl acetate
541-85-5	Ethyl amyl ketone
542-75-6	1,3-Dichloropropene
542-92-7	Cyclopentadiene
556-52-5	Glycidol
55738-54-0	trans-2((Dimethylamino)methylimino)-5-(2-(5-nitro-2-furyl) vinyl-1,3,4-oxadiazole
56-55-3	Benzo(a)anthracene
57-57-8	B-Propiolactone
57-74-9	Chlordane
57-97-6	7,12-Dimethylbenz[a]anthracene
58-89-9	gamma-BHC (Lindane)
583-60-8	o-Methylcyclohexanone
584-84-9	2,4-Toluene diisocyanate
592-62-1	Methyl azoxymethyl acetate
593-60-2	Vinyl bromide
594-42-3	Perchloromethyl mercaptan
594-72-9	1,1-Dichloro-1-nitroethane
60-29-7	Ethyl ether
60-57-1	Dieldrin
600-25-9	1-Chloro-1-nitropropane
602-87-9	5-Nitroacenaphthene
603-34-9	Triphenyl amine
626-17-5	m-Phthalodinitrile
626-38-0	sec-Amyl acetate
628-63-7	n-Amyl acetate

Table AI-13. Regulated Organic Non-detected Compounds Evaluated for Volatility (209 Compounds). (7 Sheets)

CAS #	Constituent
628-96-6	Ethylene glycol dinitrate
63-92-3	Phenoxybenzamine hydrochloride
64-18-6	Formic acid
64-67-5	Diethyl sulfate
64091-91-4	4-(Methylnitrosamino)-1-(3-pyridyl)-1-butanone
67-72-1	Hexachloroethane
68-11-1	Thioglycolic acid
681-84-5	Methyl silicate
684-16-2	Hexafluoroacetone
72-20-8	Endrin
72-43-5	Methoxychlor
74-89-5	Methylamine
74-96-4	Ethyl bromide
74-97-5	Bromochloromethane
75-04-7	Ethylamine
75-08-1	Ethyl mercaptan
75-25-2	Tribromomethane
75-31-0	Isopropylamine
75-56-9	Propylene oxide
75-61-6	Difluorodibromomethane
75-63-8	Trifluorobromomethane
7572-29-4	Dichloroacetylene
76-03-9	Trichloroacetic acid
76-11-9	1,1,1,2-Tetrachloro-2,2-difluoroethane
76-12-0	1,1,2,2-Tetrachloro-1,2-difluoroethane
76-15-3	Chloropentafluoroethane
76-44-8	Heptachlor
768-52-5	N-Isopropylaniline
77-47-4	Hexachlorocyclopentadiene
77-73-6	Dicyclopentadiene
78-10-4	Ethyl silicate
78-59-1	Isophorone
79-04-9	Chloroacetyl chloride
79-11-8	Chloroacetic acid
79-24-3	Nitroethane
79-27-6	Acetylene tetrabromide

Table AI-13. Regulated Organic Non-detected Compounds Evaluated for Volatility (209 Compounds). (7 Sheets)

CAS #	Constituent
79-41-4	Methacrylic acid
794-93-4	Panfuran S (dihydroxymethylfuratrizine)
8001-35-2	Toxaphene
8003-34-7	Pyrethrum
82-68-8	Pentachloronitrobenzene (PCNB)
822-06-0	Hexamethylene diisocyanate
86-30-6	N-Nitrosodiphenylamine
87-86-5	Pentachlorophenol
88-06-2	2,4,6-Trichlorophenol
88-72-2	Nitrotoluene
88-89-1	Picric acid
89-72-5	o-sec-Butylphenol
91-22-5	Quinoline
92-93-3	4-Nitrobiphenyl
93-76-5	2,4,5-T
94-75-7	2,4-D
95-13-6	Indene
95-49-8	o-Chlorotoluene
95-95-4	2,4,5-Trichlorophenol
96-09-3	Styrene oxide
96-12-8	1,2-Dibromo-3-chloropropane
96-33-3	Methyl acrylate
96-69-5	Bis(3-tert-butyl-4-hydroxy-6-methyl-phenyl) sulfide
97-56-3	o-Aminoazotoluene
98-00-0	Furfuryl alcohol
98-01-1	Furfural
98-51-1	p-tert-Butyltoluene
98-82-2	Cumene
999-61-1	2-Hydroxypropyl acrylate

CAS # = chemical abstract services number.

Table I-14. Regulated Organic Non-detected Compounds Considered Non-volatile (27 Compounds).

CAS #	Constituent
101-68-8	Methylene bis(phenyl isocyanate)
115-86-6	Triphenyl phosphate
122-66-7	1,2-Diphenylhydrazine
132-64-9	Dibenzofuran
1582-09-8	Trifluralin
193-39-5	Indeno(1,2,3-cd)pyrene
205-82-3	Benzo[j]fluoranthene
205-99-2	Benzo(b)fluoranthene
207-08-9	Benzo(k)fluoranthene
218-01-9	Chrysene
2385-85-5	Mirex
309-00-2	Aldrin
50-29-3	4,4-DDT
50-32-8	Benzo(a)pyrene
510-15-6	Chlorobenzilate
53-70-3	Dibenz[a,h]anthracene
56-55-3	Benzo(a)anthracene
57-74-9	Chlordane
57-97-6	7,12-Dimethylbenz[a]anthracene
60-57-1	Dieldrin
63-92-3	Phenoxybenzamine hydrochloride
72-20-8	Endrin
72-43-5	Methoxychlor
76-44-8	Heptachlor
794-93-4	Panfuran S (dihydroxymethylfuratrizine)
8001-35-2	Toxaphene
86-30-6	N-Nitrosodiphenylamine

CAS # = chemical abstract services number.

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