0019242

Department of Energy
Richland Operations Office
P.O. Box 550
Richland, Washington 99352

9201427

FEB 20 1992

92-RPB-32

Mr. David B. Jansen, P.E.
Hanford Project Manager
State of Washington
Department of Ecology
P. O. Box 47600
Olympia, Washington 98504-8711

RECEIVED
FEB 26 1992
CORRESPONDENCE CONTROL

Dear Mr. Jansen:

T PLANT TREATMENT BY GENERATOR REQUEST

Enclosed for your information is a new copy of the T Plant Treatment by Generator request. This document was originally transmitted for your review August 20, 1991. We are resubmitting the document because it has come to our attention that some of the copies distributed in August did not contain the required tables and figures. We understand that your staff has not had the opportunity to begin the review of this document to date; please let us know if we can be of any assistance when the review begins.

If you have comments or questions regarding this transmittal, please contact Mr. C. E. Clark, RL, on (509) 376-9333 or Mr. B. G. Erlandson, WHC, on (509) 376-5969.

Sincerely,

Steven H. Wisness
Hanford Project Manager

EAP:RNK

Enclosure

cc w/o encl:
R. E. Lerch, WHC
T. B. Veneziano, WHC

FEB 1992
RECEIVED
EDMC

Treatment by Generator Request
T Plant Treatment Tank

I. Treatment by Generator for Waste Tank 15-1, Building 221-T Canyon

A. Generator Waste Description

Tank 15-1 receives radioactive mixed wastes (RMW) generated during equipment decontamination activities at Building 221-T (higher radiologic level decon) and the adjacent Building 2706-T (lower radiologic decon). T Plant is a radiological decontamination facility, not a dangerous waste decontamination facility. Its mission is to perform decontamination activities to reduce or remove smearable levels of radiologic contamination. Equipment decontaminated at the two buildings include centrifuges, fuel casks, railroad equipment, buses and automobiles, agitators, process vessels, wrenches, piping and valves, instrumentation, road building machinery, and plant process equipment. T Plant's decontamination waste stream is considered RMW because of past use of degreasers, residual contaminants that have accumulated from past decontamination activities, and pH adjustment (treatment) prior to shipping.

T Plant operators perform decontamination operations on equipment that is contaminated with alpha- and beta/gamma-emitting radionuclides. Depending on the equipment and nature of the contamination, the following decontamination methods have been used in the past at T Plant: steam cleaning, high-pressure water application, blasting with dry and wet abrasives, acid/base chemical immersion or spraying, electrocleaning in phosphoric/chromic acid baths, and occasional cleaning by hand using small amounts of solvents and detergents. Recent efforts to reduce the hazardous nature of the decontamination waste generated at T Plant has resulted in a significant reduction in the number of decontamination chemicals used. Water, stream, wet sandblast grit, and detergents are the primary decontamination agents currently used. Section IV of this report provides a more detailed description of the T Plant decontamination waste stream.

B. Waste Treatment Process Description

Liquid wastes generated during decontamination processes are routed via several tanks to Tank 15-1, in the 221-T Canyon (refer to Figure 1). Once sufficient waste volume has accumulated in Tank 15-1 or waste has been accumulated for more than 60 days, the collected liquid wastes are analyzed, treated, analyzed again, and shipped to the double-shell tanks.

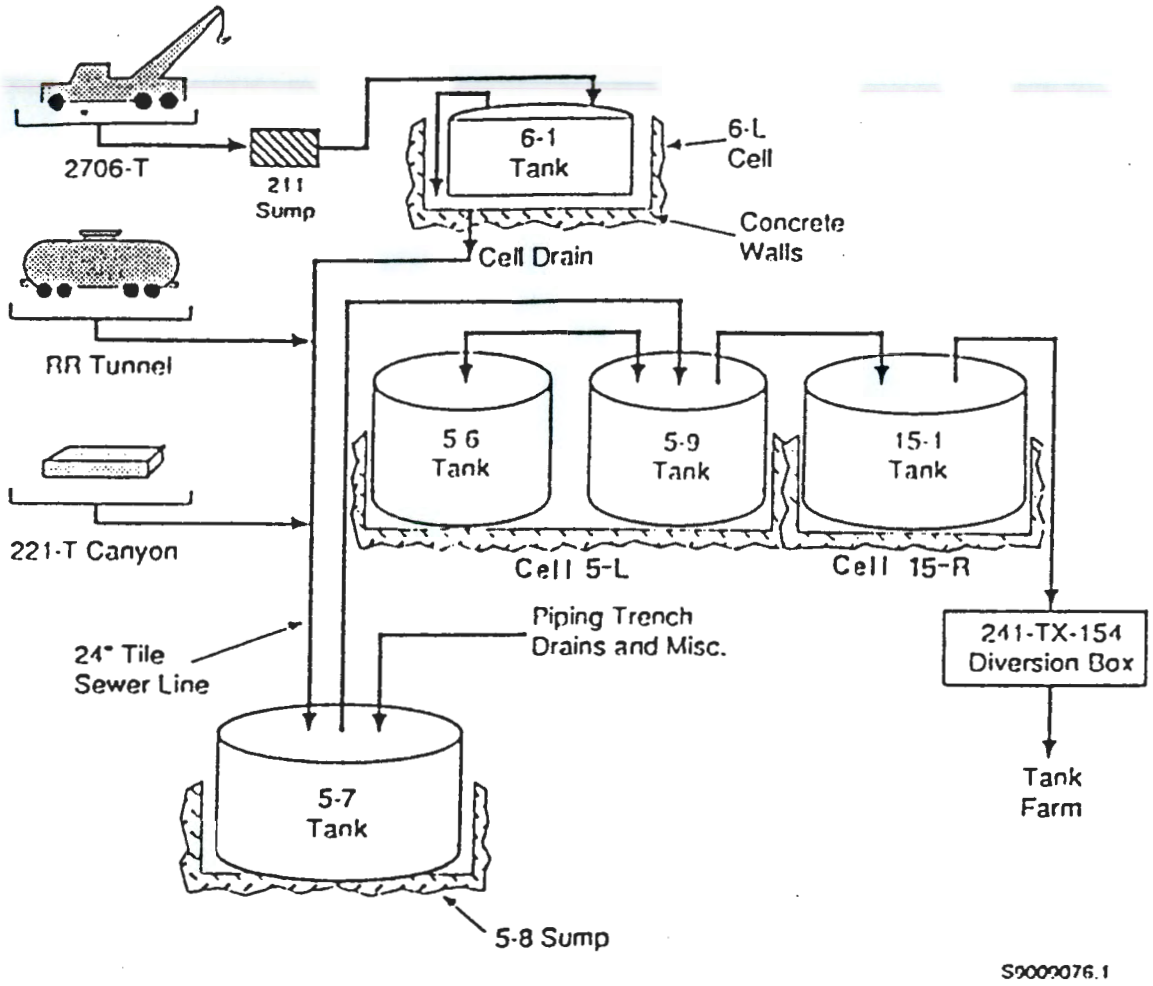


FIGURE 1: T-Plant Waste Flow Diagram

Tank 15-1 treatment is conducted to make the liquid wastes generated during decontamination activities at T Plant amenable for storage in the 200 West Area Tank Farms. The treatment is performed to meet double-shell tank farms acceptance criteria and involves the addition of sodium hydroxide and sodium nitrites to the tank. The caustic and nitrite additions are done to inhibit corrosion in transfer lines and double-shell tanks.

When sufficient waste has accumulated in Tank 15-1, it is sampled and analyzed. The analysis is performed for two reasons: to determine the amount of sodium nitrate and sodium hydroxide that must be added and very that the waste batch will be within tank farms acceptance criteria, and to verify the dangerous waste designation (refer to Tables 1 and 2).

The waste is then chemically treated by addition of sodium nitrite to greater than 600 parts per million, and addition of sodium hydroxide caustic solution to adjust the pH to be greater than 12.5. These are the minimum acceptance criteria for liquid waste stored at the 200 West Area Tank Farms. Typical quantities of caustic added are 200 to 500 pounds. Both of these materials are added manually, by the sack. The tank contents are mixed via spargers to provide complete mixing of materials.

Treatment processes in Tank 15-1 are visually monitored (through a two-foot diameter access port) to detect possible disruptions or problems. After treatment, additional analyses of the wastes are performed to ensure the treatment process was properly conducted and confirm that the tank farms specifications have been met. After confirmation, tank farms authorizes transfer of Tank 15-1 to the 241-TX-154 Diversion Box, associated with the cross site transfer line connected to tank farms. Currently the cross site transfer line is not functioning, and T Plant is transporting its' waste via railroad tank cars to the 204-AR unloading unit connected to the tank farms.

C. <u>Treatment Tank Description</u>

Tank 15-1 is located in T Plant Canyon Cell 15R in Building 221-T, in the 200 West Area of the Hanford Site (refer to Figures 2 and 3). Cell 15R is a fully enclosed concrete cell that acts primarily as protection against radiation exposure, and consequently also provides secondary containment collection in the event of losses from Tank 15-1. Physical access to Cell 15R is restricted by concrete cover blocks while radiologic wastes are present. A small access port is provided for sampling. The concrete surrounding Cell 15R ranges from six feet to nine feet in thickness. The cell is sloped to a corner drain that discharges to the 24-inch canyon

TABLE 1
GENERATOR SAMPLE PARAMETER LIST

PARAMETER	SW-846 REFERENCE ANALYTICAL METHOD	RATIONALE
ICP	6010	a
Ba		
Cd		
Cr		
Pb		
Ag		
As	7060	a
Hg	7470	a
Se	7740	a
Cl	300.0	b
NO_2	300.0	b
NO_3	300.0	b
OH	9040	a,b
Total Organic Carbon	9060	b
Volatile Organic Analysis	8240	a
Differential Scanning Calorimeter		a,b
Total Pu		b

NOTE:
a) Proper waste designation
b) DST boundary condition compliance

Table 2
DST Characterization Sample Analyte List

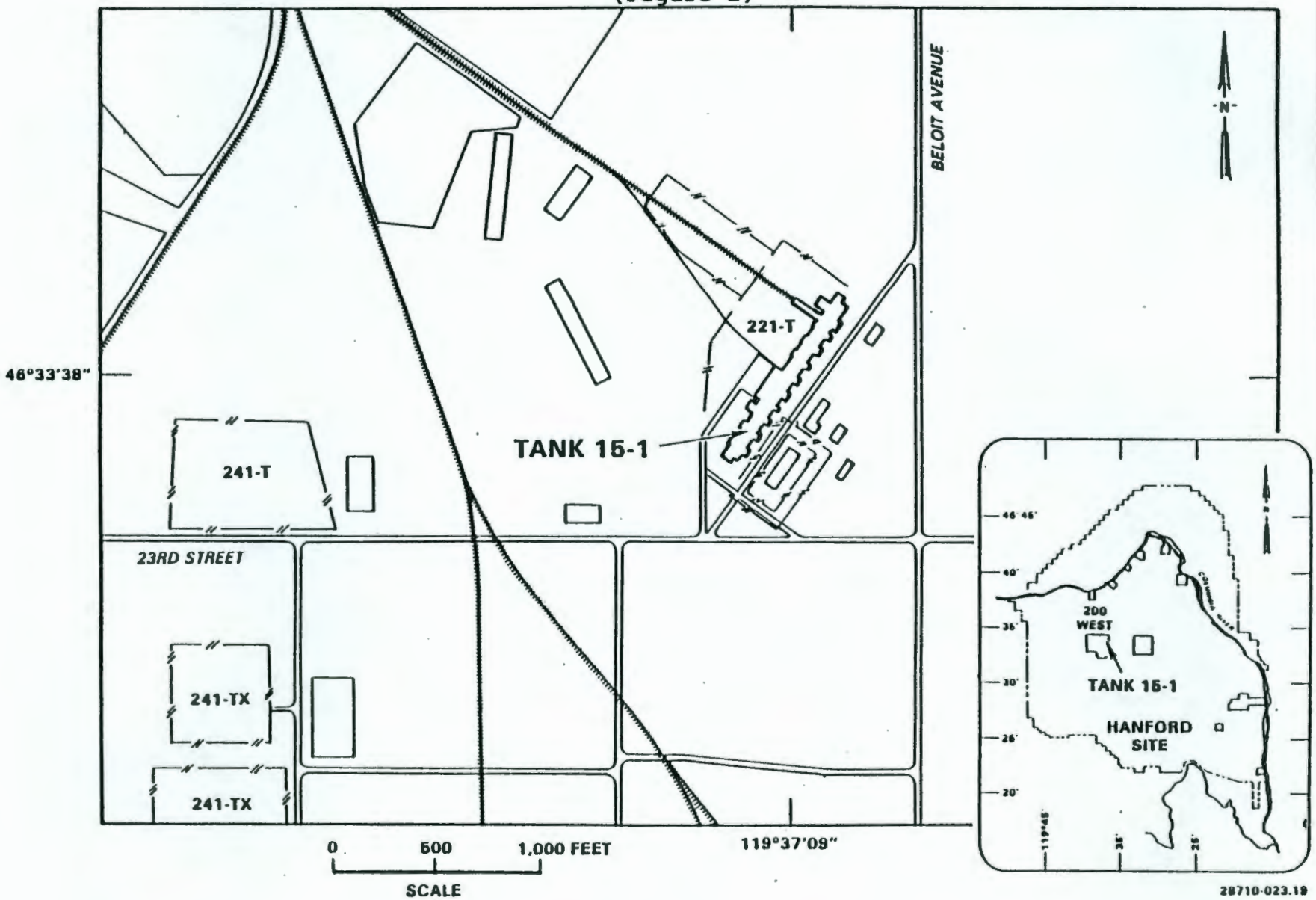
Analyte	Reference Analytical Method	Ratichale
Inorganic Analysis		
Ag	6010, 7760	a, b
Al	6010, 7020	a
As	7061	a, b
Ba	6010, 7080	a, b
Be	6010	a
Bi		a
Ca	6010, 7040	a
Cd	6010, 7131	a, b
Cr	6010, 7190	a, b
Cu	6010	a
Fe	6010	a
Hg	7471	a, b
Pb	6010, 7420	a, b
Mg	6010, 7450	a
Mn	6010, 7460	a
Mo	6010	a
P	6010	a
K	6010, 7610	a
Se	6010, 7740	a, b
Si	6010	a
Na	6010, 7841	a
Ti		a
Zn	6010	a
Zr	6010	a
F	EPA IC 300.0	a
Cl	EPA IC 300.0	a
CN	9010	a
NO2	EPA IC 300.0	a, c
NO3	EPA IC 300.0	a, c
PO4	EPA IC 300.0	a
SO4	EPA IC 300.0	a
CO3		a
OH	9040	a, c
NH3		a

Table 2
DST Characterization Sample Analyte List

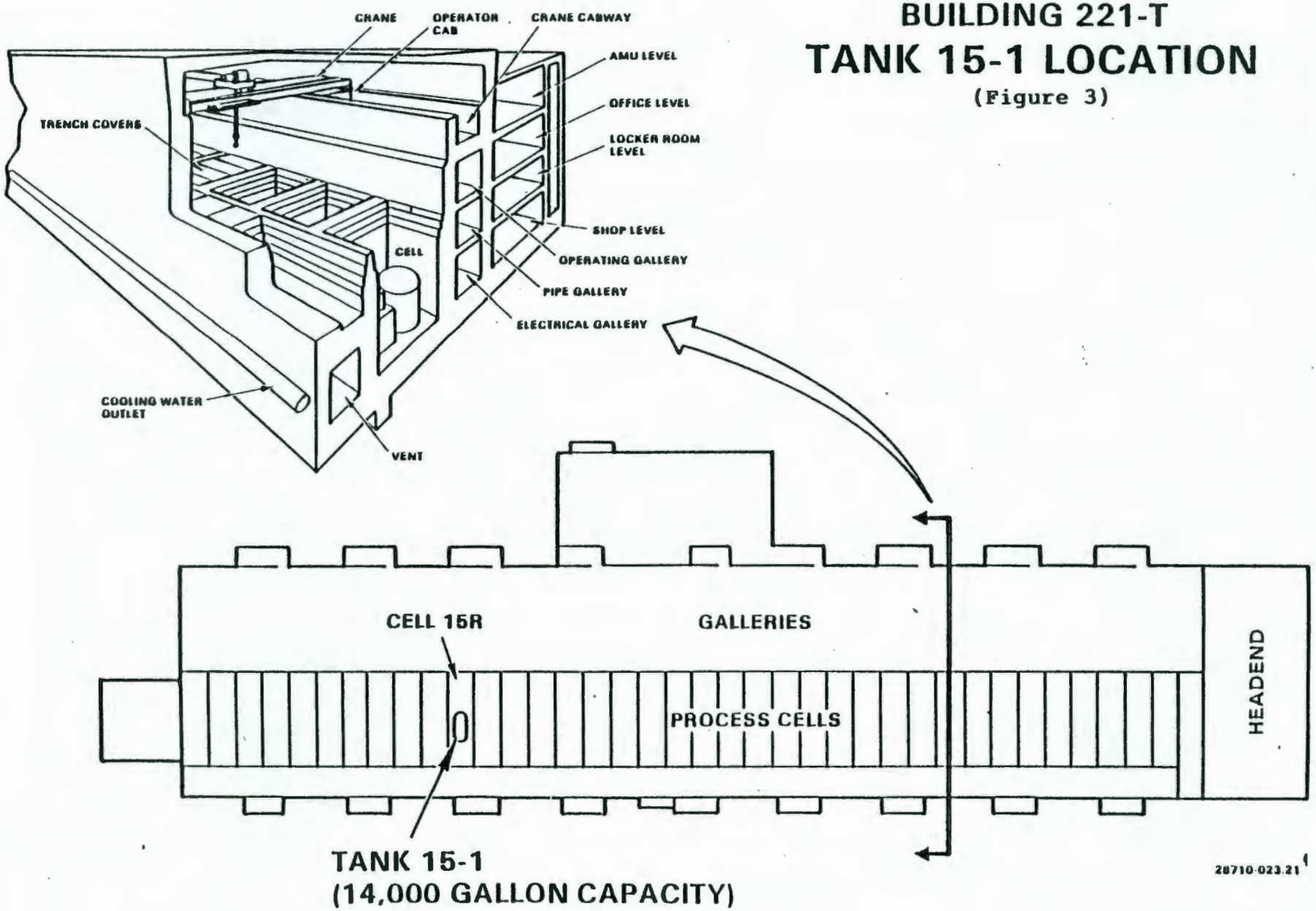
Analyte	Reference Analytical Method	Ratichale
Organic Analysis		
TOC	9060	a, c
TOX	9020, 9022	d
VOC	8240	d
Acetone		b, d
Benzene		b, d
Xylene		b, d
Toluene		b, d
Methylene Chloride		b, d
Tetrahydrofuran		b, d
Carbon Tetrachloride		b, d
MIBK		b, d
MEK		b, d
Methanol		b, d
Butanol		b, d
Physical Analysis		
DSC		b, c, d
Sp G		a, d
Radioisotope Analysis		
Co-60		a
Cs-137		a
Cs-134		a
Nb-94		a
Ru-Rh-106		a
H-3		a
C-14		a
Se-79		a
Sr-90		a
Tc-99		a
I-129		a
Am-241		a
Np-237		a
Pu-238		a, c
Pu-239/240		a, c
Cm-244		a

NOTE:
a) Grout and/or HWVP characterization/qualification analysis
b) Waste designation
c) Proper waste storage assurance
d) Evaporation process analyte

221-T BUILDING
TANK 15-1
SITE PLAN
(Figure 2)



BUILDING 221-T
TANK 15-1 LOCATION
(Figure 3)



drain header. Spills or discharges from Tank 15-1 are immediately drained from Cell 15R by gravity to the 24-inch header and then to Tank 5-7, and eventually returned to Tank 15-1 after the tank level has been reduced or the tank has been repaired to prevent further overfills or leaks (See Figure 3). Tank 15-1 is a 14,000 gallon capacity stainless steel tank. The tank is oval-shaped, with a flat bottom and open top. It is approximately 14 feet high by 16 feet wide by 20 feet long (refer to Figure 4). A manometer dedicated to Tank 15-1 measures liquid levels in the tank. Pipelines entering the top of the tank allow for the addition and removal of wastes and materials by pump only.

II. Comparison with State Treatment by Generator Criteria

The criteria established by State of Washington Department of Ecology (Ecology) in Technical Information Memorandum Number 86-3, as presented in preamble of this enclosure, were reviewed with respect to the Tank 15-1 treatment process. In further discussions with Ecology in December 1990, several more criteria were formally added: "treatment is in one tank," "bone head" or simple treatment only, and good tank integrity. In addition, Ecology noted that treatment by generator authorization not be looked at as a permanent permit. Following is a discussion of how the Tank 15-1 treatment process satisfies each of Ecology's criteria.

A. Inherent Risk of the Treatment Process

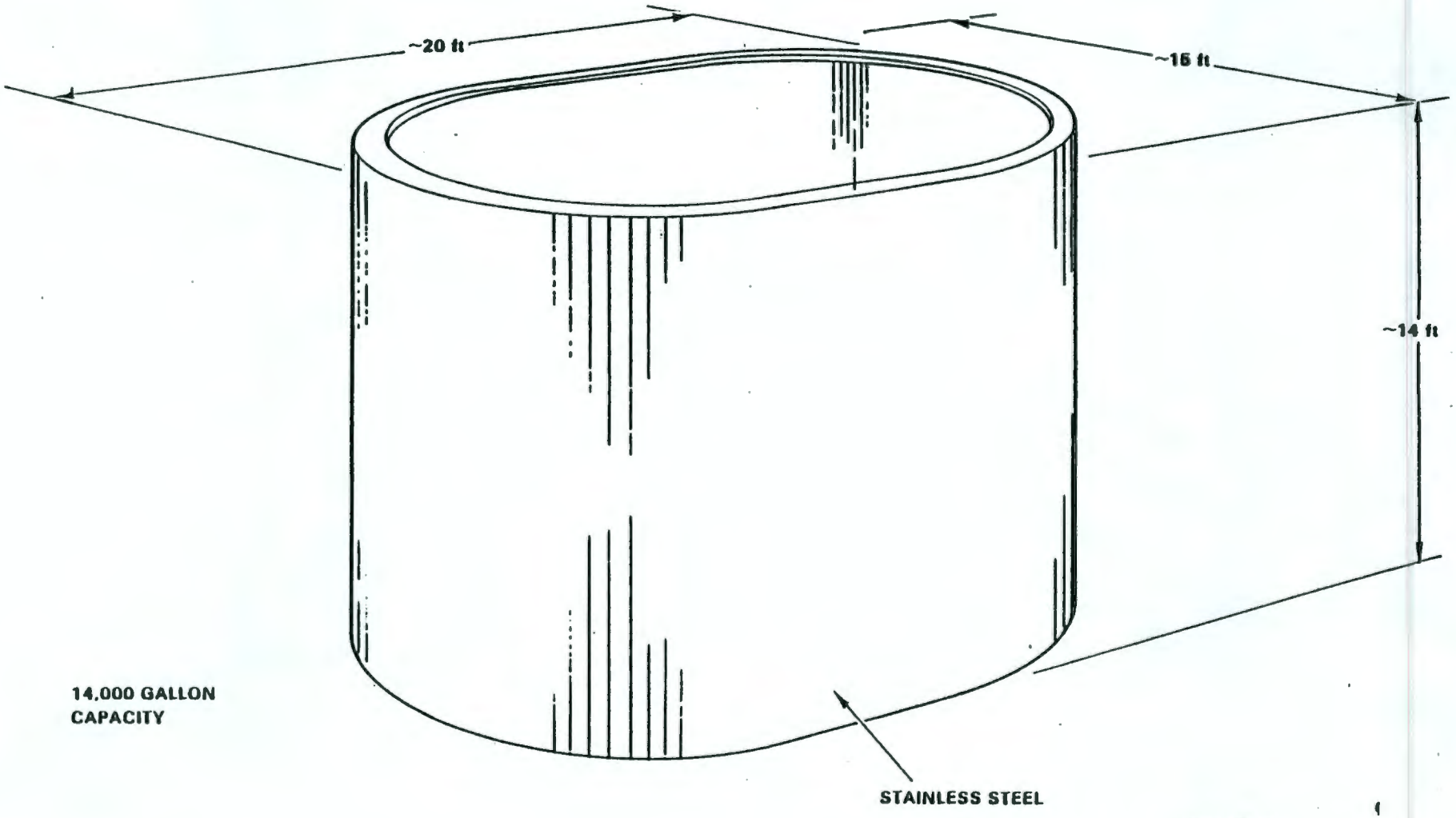
The treatment process, addition of sodium nitrite and sodium hydroxide, is considered a low risk process. The sodium nitrite and sodium hydroxide are added slowly to prevent uncontrolled reaction. Due to the nature of the waste being treated (primarily water and slightly basic), there is a low potential for generation of gases during treatment; however, all cells in Building 221-T are maintained at a slight negative pressure, so escape of gases from the cells to areas where workers are located cannot occur. The ventilation system continuously removes gases generated in Cell 15R to a high efficiency particulate air (HEPA) system and exhaust stacks.

The treatment process occurs in a contained vessel isolated from employees through a physical barrier and presents a low risk to public health and the environment.

B. Waste Toxicity

Wastes treated in Tank 15-1 pose risk primarily from their radioactive nature - the waste material is a dilute solution, primarily water with soaps, emulsified oils, sandblast grit and dirt, traces of other materials washed from decontaminated equipment. Historically, the waste mixtures at Tank 15-1 have been

TANK 15-1
(Figure 4)



14,000 GALLON
CAPACITY

corrosive and contained low concentrations of toxic and/or toxicity characteristic constituents. Analytical results presented in Table 3 of this report confirm the absence of significant quantities of these contaminants (with the exception of lead found in one sample at 33.0 parts per million (ppm), that has not been analytically confirmed yet).

C. Risk and Probability of Release

The principal avenues of waste release from Tank 15-1 would be to the air or secondary containment system in Cell 15R. As discussed above, reaction gas release to the atmosphere is not likely and does not pose a risk because it is withdrawn and filtered prior to its exhaust to the atmosphere. The HEPA filters are monitored for radiological contamination and pressure drop.

To date, there is no evidence or record of integrity failure for the Tank 15-1 tank system including the secondary containment system. Releases from the 15-1 Tank to its containment system are detected via a tank high level alarm, a tan manometer, and a liquid level chart recorder. These systems are monitored daily and calibration checked regularly. Use of these systems and current operating procedures make the risk of a liquid release low. The secondary containment can provide containment for the volume of Tank 15-1.

Work is underway for a tank integrity assessment on the entire decontamination waste collection tank system, discussed below. In addition, the design of the 221-T Canyon, with its thick concrete shell, reduces the risk and probability of a release to the environment.

D. Relative Benefit to the Environment

Treatment of the wastes accumulated in Tank 15-1 renders those wastes amenable for storage at the 200 West Area Tank Farms double-shell tanks. As noted above, treatment is performed to inhibit corrosion and stabilize the radiological characteristics of this waste, directly benefiting the environment by protecting the double-shell tank system from failure. If treatment was not performed, the wastes could not be stored in double-shell tanks and other methods of storage would have to be considered. Alternate storage options do not exist at this time.

Acceptance of the waste by tank farms facilitates further treatment activities in the future Grout Treatment Facility and/or the future Hanford Waste Vitrification Plant which will immobilize the toxic constituents.

Table 3
Analytical Results

2706-T Sump - Liquid Phase		211-T Sump - liquid Phase	
Metals = below limits		Metals = below limits	
Organics		Organics	
VOAs		VOAs	
Methlyene Chloride	= trace	Methlyene Chloride	= trace
Acetone	= trace	Acetone	= trace
Toluene	= trace	Toluene	= trace
Benzene	= trace	Chloroform	= trace
Semi VOAs		Semi VOAs	
		Phthalates	= trace
		Other unquantified hydrocarbons and acids	
PCBs		PCBs	
Aroclor 1254	= trace	Aroclor 1254	= 30ppb
TOX	= 204-455ppb	TOX	= 242ppb
Temp	= 14.3 C	Temp	= 15.6 C
pH	= 9.1	pH	= 10.3
Conductivity	= 290	Conductivity	= 760

Table 3
Analytical Results (continued)

TK 5-7		TK 15-1	
Metals * = above limits		Metals	
		(no results)	
Chromium	= 3.61ppm		
Barium	= 0.20ppm		
Silver	= 2.96ppm		
Lead	= 33.0ppm*		
Cadmium	= 0.23ppm		
Organics		Organics	
VOAs		VOAs	
Methylene chloride	= trace	Methylene chloride	= trace
Toluene	= trace	Chloroform	= trace
Styrene	= trace		
Benzene	= trace		
Other unquantified hydrocarbons, phosphoric acid, and phenols			
Semi VOAs		Semi VOAs	
none identified		none identified	
PCBs		PCBs	
Aroclor 1254	= 2.1ppb	Aroclor 1254	= 10.6ppb
		Aroclor 1260	= 3.6ppb
TOX	= 670ppb	TOX	= 1608ppb
Temp	= 15.3 C	Temp	= 19.5 C
pH	= 9.5	pH	= 9.5
Conductivity	= 1050	Conductivity	= 1870

III. Compliance with Generator Accumulation Requirements

The following information presents the measures taken toward meeting the applicable generator accumulation requirements set forth in Washington Administrative Code (WAC) 173-303-200 (1) and ensuring compliance for Tank 15-1 tank system and the treatment processed conducted in the tank.

General Requirements

A. Transfer of Dangerous Wastes to a Permitted Facility within 90 Days of Generation, WAC 173-303-200(1)(a)

As discussed above in Section I.A., wastes that accumulate in Tank 15-1 are treated, at least bimonthly, and transferred to the 200 West Area Tank Farms as soon as a final analysis is received. Thus, wastes never accumulate in Tank 15-1 for more than 90 days after they are generated. A violation of this limitation occurred last year, due to temporary closure of the cross site transfer line, and was reported to Ecology through the SEN 7 report. Because of this, T Plant has developed the ability to also transfer waste via a railroad tank car.

B. Labeling, WAC 173-303-200(1)(d)

Personnel rarely have physical access to Cell 15R or Tank 15-1 and never have physical access while wastes are present in the tank. The public never has access to Cell 15R or Tank 15-1. Activities and procedures at Building 221-T clearly recognize the radiologic and chemical hazards associated with Tank 15-1, and personnel are trained accordingly. Any labeling requirements under the federal Atomic Energy Act are currently satisfied. Although the present labeling system does not meet the Resource Conservation and Recovery Act labeling requirements for tank systems, the existing system for marking and labeling these units provides and equivalent level of protection.

C. Personnel Training, WAC 173-303-330

A personnel training plan has been prepared and is being implemented. Dangerous waste on-the-job training (Course Number 006H) and Generator Hazards Safety Course (Course Number 006G) are currently presented annually to each employee at Building 221-T. Training records for facility personnel are maintained and updated as needed. The training plan and training records are available at
Building 221-T.

D. Preparedness and Prevention, WAC 173-303-340

Building 221-T has both an internal and an external telephone communication system. An alarm system can be used to notify personnel as well as emergency response teams in the event of an emergency. Fire extinguisher and spill control equipment are present throughout Building 221-T. Arrangements and agreements have been made with non-Hanford Site parties who might be expected to respond in the event of emergencies, and these arrangements are documented in Memorandums of Understanding.

E. Contingency Plan and Emergency Preparedness, WAC 173-303-350

An overall Hanford Site emergency plan exists and addresses emergencies that may occur at the Hanford Site. In addition, a contingency plan has been prepared for T Plant that specifically includes the Tank 15-1 tank system. The Hanford Site emergency plan and the T Plant contingency plan are available and maintained at T Plant and the Hanford Site in various locations. The T Plant contingency plan is amended as needed to ensure that it is kept current and accurate.

F. Emergencies, WAC 173-303-360

The appropriate procedures, ad described in the Hanford Site emergency plan and incorporated in the T Plant contingency plan, will be followed in the event of emergencies. Emergencies associated with the Tank 15-1 tank system that require implementation of the Hanford Site emergency plan or the T Plant contingency plan will be reported to the Westinghouse Hanford Company (WHC) Occurrence Reporting organization as soon as they are detected. Notification is then made through the DOE Field Office Richland to appropriate state and/or local agencies who have response roles. Follow-up written reports will be submitted to Ecology within fifteen days after occurrence of an emergency requiring implementation of the emergency plan.

Emergencies that could threaten human health or the environment outside Building 221-T will be reported as soon as detected to Ecology and the National Response Center. In addition, reports of releases from Tank 15-1 will be submitted as described under Section III.L., below.

Requirements for Tank Systems

G. Applicability, WAC 173-303-640(1)

The requirements of WAC 173-303-640 apply to the accumulation and treatment of dangerous wastes in tanks by generators; except that, WAC 173-303-640(8)(c) does not apply, and in lieu of WAC 173-303-640(5)(b)(iii) for uncovered tanks, a minimum freeboard of two feet must be maintained.

WAC 173-303-640(2), assessment of existing tank system's integrity, requires than an assessment of the Tank 15-1 tank system be conducted by January 12, 1990. WAC 173-303-640(4), containment and detection of releases, is required for the Tank 15-1 containment system by January 12, 1991. A compliance agreement, negotiated under the Tri Party Agreement, is being developed.

H. Integrity Assessment, WAC 173-303-640(2)

A tank system integrity assessment is underway, and will be certified by an independent, qualified, registered professional engineer. The assessment of the integrity of the Tank 15-1 and its ancillary system will be based on existing structural, design, construction, materials, and other information. Although an assessment of the tank system has not yet been performed, negotiations are underway to schedule completion of integrity assessments for Hanford Site dangerous wastes tank system. There are three milestones suggested for T Plant's tank system: Develop Engineering Studies on containment and release detection system by July 1991, complete a Tank Integrity Assessment Plan by September 1991, and complete a Tank Integrity Assessment Report by September 1992. Work on these elements is described below. These schedules, when agreed to, will be included in the Hanford Federal Facility Agreement and Consent Order.

The Tank Integrity Assessment Plan is nearing completion. This Plan contains historic and current information about the use and configuration of this tank system. It also establishes a plan for completing the assessment, which in this case includes specific Engineering Studies needed to gather the necessary data used for the Assessment. Some of these Engineering Studies are also underway at this time. To date, there is no evidence of integrity failure for the Tank 15-1 system. A secondary containment system is in place (see Section III.I., below) in the event that leaks do develop. Although Tank 15-1 and its associated secondary containment system appear to have appropriate integrity, upgrades are necessary upstream of this tank associated with delivery systems.

I. Design and Installation of New Tank Systems or Components, WAC 173-303-640(3)

Tank 15-1, including its components, is an existing tank system as defined in WAC 173-303-040. Thus, the requirements of WAC 173-303-640 applicable only to new tank systems or components are not relevant to Tank 15-1.

J. Containment and Detection of Releases, WAC 173-303-640(4)

As described in Section I.A., above, Tank 15-1 and most ancillary piping and connections to Tank 15-1 are protected with secondary containment. Cell 15R is a conduit to secondary containment for Tank 15-1, i.e., it is not designed to contain 100 percent of Tank 15-1's contents, where as Tank 5-7 does. Currently, Tank 15-1 has both a high level alarm and a liquid level chart recorder. If a release to Cell 15R were to occur, it would flow by gravity via the 24-inch concrete encased Vitrified Clay Pipe header, draining to Tank 5-7 where it is pumped back to 15-1 via Tank 5-9. All other tanks have the same alarms and level recorders as 15-1, with an additional alarm in Tanks 5-7's secondary containment sump (which in this case acts as a third level containment). The containment and leak detection systems will be evaluated as part of the tank system integrity assessment effort described in Section III.H.

K. General Operation, WAC 173-303-640(5)

Dangerous wastes and treatment reagents are not placed in Tank 15-1 if they could cause the tank to leak, rupture, or otherwise fail. Spillage and overflows are prevented by monitoring the tank levels during each operational shift and during treatment periods.

Freeboard in the tank is maintained greater than two feet by inspections and readings from tank level indicators (i.e., the Tank 15-1 manometer). The level in the tank is never allowed to exceed 145 inches (12 feet), as stated in Section I.A. and noted above.

Labeling of Tank 15-1 has been addressed in Section III.B above.

Tank 15-1, or the T Plant decontamination system, is not managed with the intent of generating dangerous wastes. T Plant's mission is to decontaminate radiologically contaminated equipment. But this equipment may have residuals of hazardous materials or dangerous wastes. However, it continues to be T Plant's objective to minimize the acceptance of dangerous waste, by requiring that equipment used in connection with dangerous waste activities be field decontaminated before receipt at T Plant. As previously discussed in Sections III.A. and C., treatment processes are operated to

prevent the generation and release of emissions to the atmosphere also.

L. Inspections, WAC 173-303-640(6) and 173-303-320(1), (2)(a), (b) and (d), and (3)

A written inspection plan and schedule for Building 221-T has been implemented. The inspection plan requires daily inspection of monitoring equipment and maintenance of an inspection log, with notations of observations and corrective actions, as needed, and specifically includes the 15-1 Tank System.

Due to the radioactive nature of the dangerous wastes treated in Tank 15-1, physical observation of some portions of the tank system during its operation entails receiving radiation exposure in excess of regulatory limits. Further evaluation of alternate methods for meeting the intent of physical inspection requirement is being performed. A petition for rulemaking change to the physical inspection requirements was submitted to the EPA and Ecology in accordance with the Hanford Federal Facility Agreement and Consent Order Milestone M-22-01 over a year ago with no response received yet.

M. Response to Releases, WAC 173-303-640(7)

If a leak or spill from Tank 15-1 is detected, pumping of dangerous wastes and/or treatment reagents to the tank will be stopped. If necessary to prevent continued leaking and to provide the opportunity for necessary repairs due to loss of tank integrity from Tank 15-1, the tank will be emptied to an upstream accumulation tank (Tank 5-9). The cause of the leak or spill will be determined and appropriate measures will be taken to correct the cause of the leak or spill before Tank 15-1 is reintroduced to service. Releases to secondary containment systems are removed immediately by the Cell 15R containment conduit and routed to Tank 5-9 via Tank 5-7.

If releases to the environment are detected as a result of a spill or leak from Tank 15-1, such releases will immediately be contained per instructions covered in the emergency/contingency plans noted above. Environmental releases, if they occur, will be removed and their impacts on the environment will be mitigated. Releases to the environment in excess of applicable Reportable Quantities or 1 pound, whichever is less, will be reported to Ecology within 24 hours of detection. The National Response Center will be notified pursuant to 40 Code of Federal Regulation Part 302. If a 24-hour report to Ecology is necessary, it will be followed up by a written report on the release from Tank 15-1.

N. Closure and Post-Closure Care, WAC 173-303-640(8)

At closure, dangerous wastes and contaminated equipment and structures (including underlying materials contaminated with dangerous wastes or dangerous waste constituents) will either be removed from Tank 15-1 and the surrounding area (Cell 15R), decontaminated, or stabilized and closed as a landfill. Closure of Tank 15-1 and the surrounding area will be: performed in a manner that will minimize the need for further maintenance, control, minimize, or eliminate post-closure releases that could threaten human health or the environment, achieve the removal and decontamination criteria of WAC 173-303-610(2)(b), and be consistent with the requirements of the Atomic Energy Act and As Low as Reasonably Achievable goals.

O. Special Requirements, WAC 173-303-640(9) and (10)

Tank 15-1 does not received or handle ignitible or reactive dangerous wastes. Introduction of acids and caustic to the tank during treatment are done under controlled conditions designed to prevent hazards. The stainless steel interior of Tank 15-1 is compatible with all dangerous wastes and treatment reagents managed in the tank.

IV. Waste Analysis

A. Tank 15-1 Waste Characterization

T Plant's Waste Analysis Plan details the frequency and parameters necessary to characterize waste in Tank 15-1 and ancillary tanks. As noted in Section I.B. above, much of our characterization efforts are driven by requirements of tank farms, as part of their Waste Analysis Plan. Waste Analysis is required each time material is transferred to tank farms, noted in Table 1. In addition, T Plant must analyze for other constituents, based on knowledge of the waste or chemical analysis. The following two subsections describe current information on these two bases.

1. Theoretical Waste Characterization

The dangerous waste liquids treated in Tank 15-1 are comprised primarily of small amounts of decontamination chemicals in water. Currently, only water, steam, sandblast grits, and detergent are used during T Plant decontamination. In contrast to the current decontamination practices, a variety of

decontamination products have been used in the past. These chemicals and their principal ingredients include:

- Acetone
- Citric Acid
- Nitric Acid
- Potassium Permanganate
- Rust Remover (hydrochloric acid)
- Sodium hydroxide
- Sodium carbonate
- Sodium nitrite
- Turco Desealzit (methylene chloride)
- Turco 4512A and 4502 (phosphoric acid)
- Turco 4501A (potassium hydroxide)
- Turco 4306D (sodium bisulfate)
- Turco 4520 (ammonium oxalate)
- Turco 4518 and 4521 (oxalic acid)
- Turco FAB 5589 (isopropyl alcohol, sodium hydroxide)

Use of acetone and methylene chloride was stopped three years ago, along with most others. Limited use of weak acid bases remains on option. Because the T Plant tank system has not been decontaminated since their use, any one or more of these chemicals may be in Tank 15-1 at very dilute quantities during treatment (see Table 3). In addition, small amounts of oil, grease, and dirt from equipment being decontaminated is also likely to be present in the Tank 15-1 wastes.

The principal risk associated with the wastes in Tank 15-1 is the radioactive nature of the materials in the tank. Current decontamination practices use only water, steam, grit, and detergent, wastes treated in Tank 15-1 are comprised primarily of slightly contaminated waste water. Chemically, the contents of the tank present a risk primarily from corrosiveness after treatment has occurred (pH is raised to 12.5).

2. Tank 15-1 Sample Analysis Data

To support designation of tank 15-1 waste, analysis results from four sample locations in the T Plant tank system are presented in Table 1. Analysis was performed on wastes collected from the 2706-T Sump liquid, the 211-T Sump Liquid, the Tank 5-7 liquid, and Tank 15-1 (solid/liquid). The analysis results support the conclusion that the waste stream does not contain a large amount of contaminants. Only one metal (lead) was found at a concentration greater than 5 ppm, volatile organics were identified only in ppb concentrations, semi-volatile organics were found in trace amounts, and conductivity measurements ranged from 290 to 1870 mho. Semi-volatile contaminant analysis did not reveal conclusive results for specific constituents.

This was probably due to the waste stream containing miscellaneous petroleum contaminants derived from the equipment being decontaminated.

B. Tank 15-1 Waste Designation

1. Discarded Chemical Products

All of the decontamination chemical compounds identified in Section IV.A.1 were compared to the discarded chemical product list contained in WAC 173-303-9903. Two of the chemicals identified were listed in WAC 173-303-9903 (acetone and methylene chloride); however, none of the T Plant tank systems wastes are considered discarded chemical products or manufacturing chemical intermediates.

2. Dangerous Waste Sources

All of the decontamination chemical compounds identified in Section IV.A.1. were compared to the dangerous waste sources list contained in WAC 173-303-9904. Both acetone and methylene chloride were included on the list. Although not currently used at T Plant, previous T Plant operations used acetone (F003) and methylene chloride (F002) as decontamination agents. The analysis results (Table 1) indicate that extremely small amounts of acetone and methylene chloride may still be present in the T Plant tank system (however, labs blanks also had these two compounds in them, making there accurate presents questionable). Because Tank 15-1 has not been decontaminated (or gone through closure) since used for handling listed waste, therefore, the present T Plant decontamination waste is still considered a listed waste.

3. Infectious Dangerous Wastes

Because the waste stream does not fall under the definition of infectious dangerous waste, it is not regulated as an infectious dangerous waste.

4. Dangerous Waste Mixtures

Toxic: Tank farms acceptance criteria requires that Tank 15-1 waste be raised to a pH of at least 12.5 with a 0.011 M nitrite concentration. This is accomplished by the addition of NaOH (toxic C) and $NaNO_2$ (toxic X). Based on the presence of NaOH and $NaNO_2$, the waste stream should, therefore, be designated as toxic dangerous waste (WT01).

In addition to the NaOH and $NaNO_2$, other contaminants may be introduced into the waste stream from decontamination agents or from the equipment being decontaminated. However, the waste analysis results and process knowledge does not indicate that additional contaminants are present in significant quantities.

Persistence: Although none of the decontamination products identified in Section IV.A.1. are considered a persistent material, persistent agents could be introduced into the waste stream from the equipment being decontaminated. The potential concentration of these agents is not anticipated to be significant. Analytical results (see Table 1) indicate total organic halogen concentrations far below the 0.01 percent required for designation of a persistent dangerous waste. In addition, none of the analytical data indicates the presence of polycyclic aromatic hydrocarbons in excess of 1.0 percent. It is, therefore, concluded that the waste stream is not a persistent dangerous waste.

Carcinogens: Only one of the decontamination products identified in Section IV.A.1. was identified as a carcinogen, anticipated, that carcinogenic agents are introduced into the waste stream from the equipment being decontaminated; however, as shown by the sample analysis, other contaminants are present in trace concentrations only. Because methylene chloride is no longer used at T Plant, it is not likely to be present in significant quantities. Analytical results (see Table 1) indicate that methylene chloride is present only in concentrations well below the 0.01 percent concentration required for designation as a carcinogenic waste. It is, therefore, concluded that the waste stream is not a carcinogenic dangerous waste.

5. Dangerous Waste Characteristics

The following information was developed from a sampling period conducted last year. Based on T Plant's Waste Analysis Plan, regular periodic analysis is being done on Tank 15-1 waste. This new data is not yet available. However, we do not expect a change in any of the significant analytes.

Ignitability: Because the T Plant decontamination waste stream consists primarily of water with small concentrations of contaminants, the waste stream does not exhibit the characteristic of ignitability.

Corrosivity: In the past the T Plant tank waste stream pH has been less than 2.0 prior to treatment with sodium hydroxide and sodium nitrite; therefore, the waste stream is designated as corrosive waste (D002). Current decontamination practices at

T Plant (nitric acid is no longer used) reduce the potential for generation of acidic waste. Recent pH monitoring (see Table 1) of the tank contents prior to treatment have shown the waste stream to be slightly basic prior to treatment. After treatment in Tank 15-1, the waste again becomes corrosive, with a pH of 12.5.

Reactivity: Again, because the T Plant decontamination waste stream consists primarily of water, it is not likely to meet any of the definitions of reactivity identified in WAC 173-303-090. The waste is not unstable, does not react violently with water, form explosive mixtures, generate toxic gases, and is not explosive.

Toxicity: None of the T Plant decontamination chemicals identified in Section IV.A.1. are included in the toxicity characteristic list of WAC 173-303-090(8), although it is possible that contaminants from equipment being decontaminated will introduce these constituents to the waste stream. Analytical results indicate the presence of some toxicity characteristic contaminants. Only one sample (Tank 5-7 liquid sample) was found to contain a contaminant concentration above the dangerous waste criteria. Lead was detected at 33.00 ppm in this sample, making the waste code D008 applicable to the waste stream.

C. Tank 15-1 Waste Designation Summary and Conclusions

Based on process knowledge of the chemical decontamination agents that are and have been used in the T Plant decontamination stream, the following wastes codes have been determined applicable to the waste stream: F002, F003, WT01, D008, and D002.

CORRESPONDENCE DISTRIBUTION COVERSHEET

Author	Addressee	Correspondence No.
A. G. Miskho, 6-7313	David B. Jansen Hanford Project Manager	Incoming: 9201427 (Xref: 9159302D)

Subject: T PLANT TREATMENT BY GENERATOR REQUEST

INTERNAL DISTRIBUTION

Approval	Date	Name	Location	w/att
		Correspondence Control	A3-01	
		S. L. Brey	T6-12	
		J. D. Briggs	T6-14	
		G. C. Carpenter	B2-16	
		C. K. DiSibio	B3-03	
		J. A. Eacker	R1-51	
		L. A. Garner	T5-54	
		B. G. Erlandson	B2-19	
		C. J. Geier	B2-19	
		K. A. Hadley	N1-35	
		W. H. Hamilton	N3-10	
		D. G. Hamric	R1-51	
		O. S. Kramer	B2-35	
		G. J. LeBarron	S6-19	
		R. E. Lerch, Assignee	B2-35	
		P. J. Mackey	B3-15	
		H. E. McGuire, Level I	B3-63	
		J. C. Midgett	S6-15	
		A. G. Miskho	B2-19	
		R. D. Morrison	B2-19	
		R. D. Pierce	N3-13	
		M. E. Thurman	T3-28	
		T. B. Veneziano	B2-35	
		EDMC	H4-22	
		CJG:AGM File/LB	B2-19	

RECEIVED
FEB 26 1992
CORRESPONDENCE CONTROL