

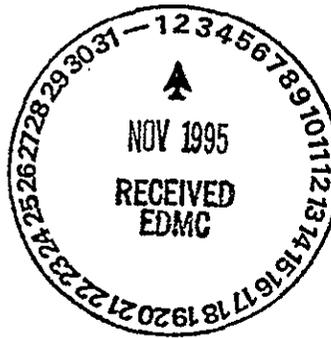


STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

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October 31, 1995

Mr. Paul Dunigan
TPA Project Manager
U.S. Department of Energy
P. O. Box 550
Richland, WA 99352



Dear Mr. Dunigan:

Re: Review of Tank Characterization Reports and Failure to Meet M-44-08

The Washington Department of Ecology (Ecology) has reviewed the 30 Tank Characterization Reports (TCRs) submitted to fulfill the Hanford Federal Facility Agreement and Consent Order (Tri-Party Agreement or TPA) and have determined for a number of reasons that 5 are marginally adequate and 25 are inadequate. Therefore, Ecology has determined the U.S. Department of Energy (USDOE) has failed to meet the requirements of TPA Milestone M-44-08 as explained in an earlier communication¹.

Attached is a list of the 30 TCRs submitted to fulfill M-44-08 and a description of the technical deficiencies of each. Refer to this document for detailed information on each report. However, there are a number of generic points for the TCRs which have contributed to Ecology rejecting these documents. These general technical deficiencies are:

- **Inadequate Analytical Data:** 22 of the TCRs consist only of historical information and analytical results to fulfill the Safety Screening and Organic Fuel Data Quality Objective (DQO) Documents. These DQOs provide very limited new analytical results which do not appreciably add to the characterization of the waste stored in the high level mixed waste tanks as required by M-44.
- **Inappropriate Use of Historical Modeling Data:** Ecology has made it very clear in meetings with USDOE and its contractors that historical modeling data cannot be used in TCRs until an evaluation is made of the quality of the modeling predictions. USDOE has written a Historical DQO whose main purpose is to evaluate the quality of modeling data. The Historical DQO was not applied to any of the tanks for which TCRs were written. However, in most of the TCRs, historical modeling data comprise the main source for the tank

¹ letter, Stone, Alex of Ecology to Holton, Richard of USDOE, "RE: Review of Tank Characterization Reports and Failure to Meet M-44-08", dated October 31, 1995.

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inventory estimates. No information is included concerning the Historical DQO, nor is the reader cautioned concerning the lack of validity of this data. The historical data are more questionable when one evaluates the number of "unknown" transfers in and out of the tanks, thereby increasing the likelihood the historical estimates fail to adequately represent the tank contents. The historical tank inventory estimates are included without appropriate limitations and increases the likelihood this data would be used for fulfilling TPA requirements when such use is not allowed.

- **Inappropriate Use of Pre-1989 Data:** The TPA clearly states any analytical data collected prior to May 1989 cannot be used to fulfill TPA Milestone requirements. In several documents, sampling data from pre-1989 analyses have been used to formulate historical content estimates and used to make safety decisions. Ecology has expressed in earlier meetings it is willing to see this information included in a TCR; however, the information cannot be used for making any regulatory/safety decisions and/or content estimates which may be incorporated into decisions implemented by other groups at Hanford. In most of the reports where pre-1989 analytical data are included, no mention of the TPA requirements are made. In the few instances where the point is made concerning the use of pre-May 1989 information, it is not clear what use is appropriate.
- **Failed to Implement Appropriate DQOs:** USDOE failed to implement appropriate DQOs without valid explanation. For example, in Tank TY-104 (a ferrocyanide Watch List tank), USDOE failed to analyze for the chemical species required by the Ferrocyanide DQO because the tank "is not included in the priority list" (page 1-2 of Tank TY-104 TCR). There are numerous other instances where DQOs were either not applied or not applied in their entirety. Milestone M-44 clearly states that the appropriate DQOs must be implemented and USDOE did not implement DQOs where needed (for example, Watch List tanks).
- **Capricious Implementation of DQO Requirements:** USDOE has made decisions which are directly contrary to DQO requirements. For example, in Tank BX-108, USDOE decided the Safety Screening DQO requirements could be altered to allow a simple screening method to replace the Vapor DQO analyses (page 4-6 of the BX-108 TCR). If applied as dictated by the TPA, the DQOs incorporate the input from all stakeholders and provide the technical basis for the required analyses. USDOE cannot subsequently decide to abrogate the process and only implement those portions of the DQOs it considers important. In addition, some TCRs incorporate data which do not meet DQO requirements such as samples from two widely spaced risers, etc.
- **Inadequate DQO Documents:** Ecology has notified USDOE the DQO process was not followed as required by the TPA. USDOE has failed both to involve external stockholders

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and to either respond or incorporate Ecology's comments in several instances². In addition, USDOE has decided to implement some inadequate DQOs while ignoring others. Therefore, the TCRs are not acceptable until the DQOs are substantially improved and Ecology has approved the final documents.

- **Incomplete Incorporation of DQO Results:** Milestone M-44 clearly states the three phases of the tank (gas, liquid and solid) are to be characterized and included in the TCRs. USDOE, however, has selected what data from the DQOs to include in the TCRs without appropriate justification. For example, Ecology agreed to have the results of the Vapor DQO presented in the form of a TCR chapter³. Those reports, however, for which the Vapor DQO was implemented, included only a very select, limited summary of the results in these chapters. This data failed to represent in detail what was learned about the vapor space of the tanks through the implementation of the DQO.
- **Poor Sample Recovery and Poor Sampling Method Selection:** Most of the TCRs indicate the sample recovery was a severe problem for the sampling done over the last two fiscal years. It was stated in several reports that the recovery of auger samples were very low in part due to the problem that auger samples do not retain aqueous material. The poor sample recovery leads to questions concerning the representativeness of the data provided. In addition, the problem of poor auger sample retention indicates inappropriate sampling methods were used for the tanks with substantial supernatant or liquid waste. Decisions based upon inadequate sample representation of tank contents fails to fulfill M-44 requirements.
- **Poor Analytical Method Selection:** A number of the reports have indicated the data included substantial error due to limitations of the sampling methods selected. For example, the determination of energetics by Differential Scanning Calorimetry (DSC) is hampered by the ability to analyze very limited sample volumes. The problem is further compounded by failure of USDOE to include supernatant where present in their DSC analyses and the contribution of supernatant to energetic reactions has not been evaluated. These problems have not been rectified over the last three years of the Characterization Program, and therefore, indicate the data used in many cases to make safety decisions as required by the TPA are not valid. It also indicates the very limited data obtained over the past two fiscal years do not adequately represent waste conditions within the tank sampled and provide an insufficient basis for a TCR.

² letter, Stone Alex of Ecology to Erickson, Leif of USDOE, "RE: Ecology Comments on DQOs", May 8, 1995. 41192

³ letter, Stone Alex of Ecology to Gerton, Ron of USDOE, "RE: Vapor Results in the Form of TCR Chapters", dated March 6, 1995. ✓

- **Failed Quality Assurance/Quality Control (QA/QC) for Sample Analysis:** None of the TCRs submitted to fulfill M-44-08 (including those accepted by Ecology as marginally adequate) meet the referenced QA/QC requirements. The problems with DSC mentioned earlier translate into energetic values which have varied by factors of two or more. Safety decisions based upon this data are not appropriate. In addition, there exists a wide variation in reporting what QA/QC controls are to be met. Most TCRs indicate the DQOs and Tank Characterization Plans (TCPs) require a relative percent difference of $\pm 10\%$. Others set their requirement to $\pm 20\%$ or $\pm 25\%$. Even these more relaxed standards are often not met and the reasons for these variations were not explained. USDOE also attempts to explain why failure of the data to meet QA/QC requirements does not represent a problem. The QA/QC requirements directly determine the quality of the data and failure to meet these requirements indicates procedure problems either in the sampling or the analyses which must be addressed. Explaining away the issue is not an acceptable option. USDOE has failed to address these issues. For these reasons, much of the data provided in the TCRs are inadequate to the uses for which they were obtained.
- **Failure to Adequately Prioritize Tank Sampling:** Of the 30 TCRs submitted to fulfill M-44-08, only 8 represent those tanks with the greatest safety concerns (i.e., Watch List Tanks). In addition, 19 of the 30 tanks contain levels of waste less than 11% of their maximum tank capacity (6 of those 19, however, are Watch List tanks). USDOE, therefore, has failed to place the appropriate emphasis on the tanks with the greatest environmental concern. In a majority of cases, USDOE has provided TCRs on tanks which are either mostly empty or still in active service and pose little immediate danger to human health and human and the environment. The Characterization Program has failed to make wise and efficient use of its resources to provide the most critical information. USDOE's inability to prioritize tank sampling is reflected in the poor quality of the TCRs presented to fulfill M-44-08.
- **Failure to Follow Procedures As Required in the TPA:** In September of 1994, USDOE failed to submit to Ecology the Tank Characterization Plans for these 30 TCRs. Milestone M-44-02 clearly states that USDOE must schedule the sampling efforts for the following year and provide TCPs for Ecology's review and approval. This process was not followed and Ecology was unable to raise many of these concerns or issues last year when it would have been appropriate.
- **Unapproved Analytical Methodologies:** WAC 173-303-110 clearly states that SW-846 or Ecology approved alternatives must be used to fulfill analytical requirements of the dangerous waste regulations. Several methods are referenced here which Ecology has not reviewed or approved. Acceptance of those few marginal TCRs neither implies Ecology approval of these methods nor does it exempt USDOE from meeting the requirements of WAC 173-303-110.

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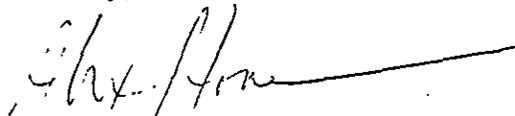
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It is for these reasons Ecology has determined USDOE has failed to meet the requirement of TPA Milestone M-44-08. Ecology and USDOE need to meet to assure these issues and problems do not re-occur and adversely affect the quality of the 40 TCRs to be submitted in September 1996 to fulfill Milestone M-44-09. Additional information on this issues discussed above on a tank by tank basis can be found in the enclosed tables.

If you need any further information on any of these issues, please call me at (509) 736-3018.

Sincerely,



Dr. Alex Stone

TWRS Characterization Team Leader

Nuclear Waste Program

AS:mf

Enclosures

cc: Steve Burnum, USDOE
Ron Gerton, USDOE
Doug Sherwood, EPA
Roger Bacon, WHC
Len Ermold, WHC
Tom Perry, GAO
Rich Tontodonato, DNFSB
Administrative Record

TCR Summary

Tank	TCR Marginally Acceptible	Watch List ¹	Amount of Waste in Tank (kgal)	Capacity of Tank (kgal)	Waste in Tank (%) ³	Applicable DQOs ⁴
AW-101	Yes	FG	1124	1140	98.6	CB
AW-103	No	No	515	1140	45.2	Comp/SS
AW-104	No	No	1123	1140	98.5	Comp/SS
AX-102	No	Org	39	1000	3.9	SS/Org
AY-102	No	No	812	980	82.9	Comp/SS
AZ-101	Yes	No	960	1000	96	SS
AZ-102	Yes	No	949	980	96.8	Comp/SS
B-102	No	No	32	530	6.0	SS
B-103	No	Org.	51	530	9.6	Org/SS
B-112	No	No	33	530	6.2	Org/SS
B-202	No	No	27	55	49.1	SS
BX-101	No	No	43	530	8.1	SS
BX-105	No	No	51	530	9.6	Org/SS
BX-108	No	No	26	530	4.9	SS
C-101	No	No	88	530	16.6	Org
C-105	No	No	135	530	25.5	SS

C-107	No	No	275	530	51.9	SS
C-111	No	FeCN	57	530	10.8	FeCN/ SS
C-201	No	No	2	55	3.6	Org/SS
C-202	No	No	1	55	1.8	SS
C-203	No	No	3	55	5.5	SS
SX-113	No	No	26	1000	2.6	SS
SY-101	Yes	FG	1100	1140	96.5	FG/SS
SY-102	Yes	No	5 ²	1140	.4	Comp/ SS
TY-104	No	Org/FeCN	46	758	6.1	Org/SS
TY-106	No	No	17	758	2.2	Org/SS
U-201	No	No	5	55	9.1	SS
U-202	No	No	5	55	9.1	SS
U-203	No	Org	3	55	5.5	Org/SS
U-204	No	Org	3	55	5.5	Org/SS

¹Org = Organic Watch List (WL); FeCN = ferrocyanide WL; FG = flammable gas WL

²Approximate after transfer of material to West Tank Farm and not reflected in TCR

³Calculated as (Amount of Waste in Tank*100)/Capacity of Tank and is expressed in percentage

⁴Org = Organic DQO; FeCN = Ferrocyanide DQO; FG = Flammable Gas DQO; CB = Crust Burn DQO;
Comp = Compatibility DQO

Tank Characterization Report Deficiencies

The following do not reflect all the deficiencies within the document but highlight the most prominent. Each TCR (including those which Ecology has determined to be marginally adequate) should be reviewed for all the points raised in the main letter.

Tank	Major Deficiencies
AW-101 (marg. adeq.)	<ul style="list-style-type: none"> ◦ 86 Evaporator campaign appears in Table 2-2. Inappropriate to use pre-1989 data in TCR except in general terms. Exact data can appear in Appendices but only with very obvious warnings and qualifiers. No comment made in text in TCR about data failing to meet TPA requirements and stating it cannot be used for making any TPA related decisions. ◦ QA/QC fails especially for DSC. ◦ Energetics exceed Safety Screening DQO requirements for crust 1995 samples. Impacts not made clear. ◦ No data on gas and solid phases - supernate analyses only.
AW-103 (inadeq.)	<ul style="list-style-type: none"> ◦ Data from core sample from Jan. 1989 reflected in tank waste inventory data. Data unacceptable per TPA and cannot appear in TCR except in general comparisons with acceptable data. ◦ QA/QC failed requirements. No QA/QC analysis for 1994 data, only a comparison between 1989 and 1994 data. Such comparisons are not allowed given the TPA does not recognize pre-May 1989 data. ◦ 1989 used to make safety decisions (i.e. 1989 data used to determine if waste meets Safety Screening DQO.) Such determinations are unacceptable and use of pre-May 1989 data in such a manner is a serious TPA violation. ◦ Limited new data as only Compatibility DQO applied to this tank.
AW-104 (inadeq.)	<ul style="list-style-type: none"> ◦ No information provided on the limitations of pre-May 1989 data. ◦ No TCP produced for this TCR therefore does not meet the requirements of M-44. ◦ Does not meet Compatibility DQO requirements as analyses were 'based upon requirements in Compatibility DQO' (pages 3-2 and 3-3) and not the DQO itself. Therefore does not meet requirements of this document. ◦ No QA/QC on 1994 data. Does not fulfill current DQO requirements. ◦ Refers to a Compatibility DQO (Carothers) with which Ecology is not familiar. The only Comp. DQO Ecology has seen is Fowler and Ecology has stated that this DQO is extremely deficient. It is impossible to determine the adequacy of a DQO Ecology has never seen. ◦ Sludge results not substantiated by documentation (page 3-2) and therefore table 4-3 should not be included as it is based on unsubstantiated data. In addition, inventory data is provided based upon the unproved assumption that one of the 1994 samples was sludge which is not acceptable. ◦ Limited new data as only Comp. and Safety Screening DQOs applied to this tank.

<p>AX-102 (inadeq.)</p>	<ul style="list-style-type: none"> ◦ Very poor sample recoveries suggesting waste not representative of material in tank. ◦ Unverified historical data used to determine chemical inventory of waste in tank. This practice is not permissible until the historical models have been verified. ◦ QA/QC fails (matrix spike recoveries for example produced a RPD of 196%). QA/QC data presented was confusing and appears to be incorrect. ◦ Limited new data (i.e. only Safety Screening and Organic DQOs applied) although more analyses were done on this waste than is standard for the two DQOs.
<p>AY-102 (inadeq.)</p>	<ul style="list-style-type: none"> ◦ Pre-May 1989 data included in report to represent solids. This is contrary to the TPA and is not allowed. ◦ 294 transfers occurred in and out of the tank after 1987 which indicate the data from 1987 has no value even if the TPA allowed its use. ◦ QA/QC fails. In addition, values of ± 20 and $\pm 25\%$ are used to evaluate the QA/QC requirements while DQOs and TCPs require ± 20. Even at these elevated values the analyses fail the QA/QC requirements. ◦ Limited new data as only Comp. DQO applied for June 94 sample. Dec. 94 sample was taken for 'process purposes' and apparently was not taken under the direction of any DQO.
<p>AZ-101 (marg. adequ.)</p>	<ul style="list-style-type: none"> ◦ Limited new data as only Comp. DQO applied to recent samples. ◦ Sludge sample taken contained no sludge, therefore any results for sludge is misleading. ◦ QA/QC requirements not met. No QA/QC for 1989 data and values of $\pm 20\%$ used for comparison of matrix spike and duplicate analyses. These numbers are contrary to the standard DQO and TCP requirements of $\pm 10\%$.
<p>AZ-102 (marg. adeq.)</p>	<ul style="list-style-type: none"> ◦ Limited new data as only limited analyses from Comp. and Safety DQOs applied. ◦ Did not meet full requirements of analytes for Comp. DQO. ◦ DSC and TGA reported in Appendix but could not be found in TCR. ◦ Core samples extruded in May and July of 1989. Unclear if these data fulfill the TPA requirement that all data must be dated after May 1989. ◦ Sludge from 1995 sampling event not analyzed.
<p>B-102 (inadeq.)</p>	<ul style="list-style-type: none"> ◦ Poor sample recovery indicating that analyses are not representative of waste in the tank. Poor sampling method selection. ◦ DQO requirements not met (for example, only one auger sample was obtained although the DQO specifies 2 augers from widely separated risers). ◦ Limited new data as only Safety Screening DQO applied. ◦ Historical modeling data used to produce a chemical inventory of the tank. This practice is not allowed until the modeling results are verified. ◦ QA/QC requirements not met (for example, Table 4-2 'does not include initial duplicate analysis data' when such data is necessary to fulfill

	<p>QA/QC requirements).</p> <ul style="list-style-type: none"> ◦ Conclusion clearly states that additional sampling is needed which indicates the information is inadequate to characterize the waste in the tank and therefore inadequate for the purposes of a TCR.
B-103 (inadeq.)	<ul style="list-style-type: none"> ◦ Poor sample recovery to fulfill TCP (from the two auger samples only 51.7 grams of sample were obtained) which indicates the samples were not representative of the waste in the tank. ◦ Large portions of sample archived (30 of 45 grams from one auger sample archived or sent to pretreatment program). ◦ Only limited data from Vapor DQO results included. ◦ QA/QC failed and is inadequate to assure quality of analyses. ◦ Historical modeling data used to produce a chemical inventory of the tank. This practice is not allowed until the modeling results are verified. ◦ Conclusions state that insufficient data obtained to make a determination of waste characteristics particularly pertaining to Watch List designation. Therefore data inadequate to characterize the waste and cannot be used as the basis for a TCR.
B-112 (inadeq.)	<ul style="list-style-type: none"> ◦ Limited new data as only Safety Screening DQO applied. ◦ Historical modeling data used to produce a chemical inventory of the tank. This practice is not allowed until the modeling results are verified. ◦ QA/QC requirements not met (for example, Table 4-2 'does not include initial duplicate analysis data' when such data is necessary to fulfill QA/QC requirements). ◦ Sample recovery was inadequate which indicates that samples are not representative of the waste (as stated in the report 'Due to the small number of samples recovered in the 1995 auger sampling event little pertinent information was deduced from the analytical results. page 5-1).
B-202 (inadeq.)	<ul style="list-style-type: none"> ◦ No new data as no sampling was done after 1991. ◦ No DQO was used to direct sampling as only results included in report occurred prior to the existence of DQOs. Results of 1991 data compared to Safety Screening DQO. ◦ Historical modeling data used to produce a chemical inventory of the tank. This practice is not allowed until the modeling results are verified. ◦ QA/QC requirements not met (for example values of $\pm 25\%$ are used to evaluate matrix spike data although the Safety Screening DQO requires $\pm 10\%$). ◦ TCR report based only upon one core sample in 1991.
BX-101 (inadeq.)	<ul style="list-style-type: none"> ◦ Limited new data as only Safety Screening DQO applied. ◦ Historical modeling data used to produce a chemical inventory of the tank. This practice is not allowed until the modeling results are verified. ◦ QA/QC requirements not met (for example values of $\pm 20\%$ are used to evaluate matrix spike data although the Safety Screening DQO

	<ul style="list-style-type: none"> ◦ requires $\pm 10\%$). ◦ Poor sample recovery (one core had 40% recovery and the second 10%) which indicates the sample is not representative of the waste in the tank.
BX-105 (inadeq.)	<ul style="list-style-type: none"> ◦ Limited new data as only Safety Screening DQO applied. ◦ 1986 core sample used to produce tank content inventory. The report states 'Data from the 1986 core sampling event are considered in this report to be valid to estimate the current contents of the tank . . .' (page ES-5). This statement is not allowed by the TPA and is contrary to statements by Ecology under other circumstances. ◦ QA/QC requirements not met (for example values of $\pm 20\%$ are used to evaluate matrix spike data although the Safety Screening DQO requires $\pm 10\%$, duplicate analyses fail requirements, etc.). ◦ Poor sample recovery (one core had 40% recovery and the second 10%) which indicates the sample is not representative of the waste in the tank. ◦ The report compared results from the 1986 and 1994 sampling events and the 1986 data was used to support conclusions in Chapter 6. As stated earlier, the use of pre-May 1989 for these purposes is not allowed by the TPA.
BX-108 (inadeq.)	<ul style="list-style-type: none"> ◦ Limited new data as only Safety Screening DQO applied. ◦ Sample recovery not clear in the report. Given the samples taken were auger and given past performance of the auger sampling, questions exist concerning the representativeness of the data. ◦ Historical modeling data was used to verify the safety of the tank ('. . . there is no total organic carbon and very little heat generation . . . further supporting the assertion that tank 2411-BX-108 is being maintained in a safe configuration. page E-7) and to produce a chemical inventory for the tank. Use of the historical modeling data for these purposes is not allowed until the historical data has been verified. ◦ DQO requirements were arbitrarily changed ('Although the safety screening DQO specifies the determination of gas composition to estimate the percentage of LFL, the Safety Program has determined that a combustible gas meter reading will satisfy the requirements of the DQO for concentrations less than 10 percent of the LFL.' page 4-6). Such changes to the DQO outside the DQO process are not allowed and the use of combustible gas meter results do not fulfill the DQO requirements. ◦ QA/QC requirements not met (DSC QA/QC data 'not shown'-page 5-2, matrix spike data failed to meet required levels, etc.).
C-101 (inadeq.)	<ul style="list-style-type: none"> ◦ Limited new data as only Safety Screening DQO applied. Additional analyses requested by 'Characterization Plant Engineering and Characterization Process Control' although no DQO was applied. ◦ Historical modeling data used to produce a chemical inventory of the tank. This practice is not allowed until the modeling results are verified. ◦ QA/QC requirements not met. ◦ Safety Screening DQO requirements not met ('The 1995 auger sampling did not fully comply with the Tank Safety Screening DQO . . .'-page 6-1).
C-105	<ul style="list-style-type: none"> ◦ Limited new data as only Safety Screening DQO applied.

(inadeq.)	<ul style="list-style-type: none"> ◦ Core samples taken in both 1986 and 1995 but only data from the 1986 core was used in the report. 1986 data used as the basis for chemical inventory of the tank. This is not allowed as the TPA does not recognize any data prior to May 1989 and is contrary to points made by Ecology at several meetings with USDOE. ◦ QA/QC requirements not met.
C-107 (inadeq.)	<ul style="list-style-type: none"> ◦ Limited new data as only Safety Screening DQO applied. ◦ Historical modeling data used to produce a chemical inventory of the tank. This practice is not allowed until the modeling results are verified. In addition, a comparison was made between the Tank Layering Model and samples using visual inspection. Such a subjective technique has no value and should not be included in a TCR. ◦ QA/QC requirements not met (for example RPD values for DSC reached 200%). ◦ The TCR states that the Pretreatment and Vitrification DQO was applicable. The report followed this information with the statement that the pretreatment program decided 'these analyses were not necessary for samples from tank 241-C-107' (page 5-10). DQOs are either applicable or not and it cannot be decided based on some criteria or decision process external to the DQO (i.e. the DQO requires too many analyses) to abrogate implementation of applicable DQOs. Such process is contrary to the Milestone M-44 of the TPA.
C-111 (inadeq.)	<ul style="list-style-type: none"> ◦ Limited new data as only Safety Screening DQO applied in its entirety. ◦ The FeCN DQO also applies (the tank is a FeCN WL tank); however, the decision was made not to implement the FeCN in its entirety (page 3-5). Such actions are contrary to the DQO process and USDOE cannot arbitrarily change decisions reached in the DQO process. This is particularly true for a WL tank when the DQO is written specifically to address that particular WL safety issue. ◦ Historical modeling data used to produce a chemical inventory of the tank. This practice is not allowed until the modeling results are verified. ◦ QA/QC requirements not met. ◦ Poor sample recoveries (0-17%) which indicates that the sample is not indicative of the waste in the tank and is an inadequate basis for a TCR. In addition, the conclusions in this report are not supported by the data given the poor recoveries. ◦ Safety Screening DQO requirements not met as sample was obtained only from 1 riser and not two, widely spaced risers as dictated by the DQO.
C-201 (inadeq.)	<ul style="list-style-type: none"> ◦ Limited new data as only Safety Screening DQO applied. ◦ Historical modeling data used to produce a chemical inventory of the tank. This practice is not allowed until the modeling results are verified. ◦ QA/QC requirements not met. ◦ Poor sample recoveries (3.7 and 12.09 grams from the 2 samples) which indicates that the sample is not indicative of the waste in the tank and is an inadequate basis for a TCR. In addition, the conclusions in this report are not supported by the data given the poor recoveries. ◦ Safety Screening DQO requirements not met as sample was obtained only from 1 riser and not two, widely spaced risers as dictated by the DQO. ◦ The TOC value was close to the Safety Screening DQO limit. Upon closer examination, it was found that the TOC was calculated based upon the mean TGA value (Table 5-3, Footnote 3). A more conservative approach would be to use the greatest TGA value which would

	potentially have a large affect upon the conclusions reached in the TCR.
C-202 (inadeq.)	<ul style="list-style-type: none"> ◦ Limited new data as only Safety Screening DQO applied. ◦ Historical modeling data used to produce a chemical inventory of the tank. This practice is not allowed until the modeling results are verified. ◦ QA/QC requirements not met. ◦ Poor sample recoveries (6 and 2.5 grams from the 2 samples) which indicates that the sample is not indicative of the waste in the tank and is an inadequate basis for a TCR. The report states itself that poor sample recovery 'casts doubts that the auger samples can effectively be used to evaluate the tank material' (page 5-1). In addition, the conclusions in this report are not supported by the data given the poor recoveries. These results are an inadequate basis for a TCR. ◦ Safety Screening DQO requirements not met as sample was obtained only from 1 riser and not two, widely spaced risers as dictated by the DQO.
C-203 (inadeq.)	<ul style="list-style-type: none"> ◦ Limited new data as only Safety Screening DQO applied. ◦ Historical modeling data used to produce a chemical inventory of the tank. This practice is not allowed until the modeling results are verified. ◦ QA/QC requirements not met. ◦ Safety Screening DQO requirements not met as sample was obtained only from 1 riser and not two, widely spaced risers as dictated by the DQO.
SX-113 (inadeq.)	<ul style="list-style-type: none"> ◦ Limited new data as only Safety Screening DQO applied. ◦ Historical modeling data used to produce a chemical inventory of the tank. This practice is not allowed until the modeling results are verified. ◦ QA/QC requirements not met. ◦ Poor sample recoveries (249 and 97.8 grams from the 2 samples) which indicates that the sample is not indicative of the waste in the tank and is an inadequate basis for a TCR. In addition, the conclusions in this report are not supported by the data given the poor recoveries. These results are an inadequate basis for a TCR.
SY-101 (marg. adequ.)	<ul style="list-style-type: none"> ◦ TRAC was used in the TCR to provide historical perspective on the tank contents. The TRAC model has proven unreliable for non-radioactive species and should not be included in a TCR. ◦ QA/QC requirements are not met.
SY-102 (marg. adequ.)	<ul style="list-style-type: none"> ◦ 1988 data used to make decisions on tank contents (for example, actinide concentrations) which is not allowed under the TPA. ◦ QA/QC requirements not met. ◦ Sampling does not fulfill current Safety Screening DQO requirements (only 1 riser used for core samples in 1990 where the DQO requires

	two, widely separated risers for sample collection).
TY-104 (inadeq.)	<ul style="list-style-type: none"> ◦ Limited new data as only the Safety Screening and Organic DQOs were applied in their entirety. ◦ FeCN DQO not applied although this is a FeCN WL tank. The TCR states the FeCN analyses were not done because the tank 'is not included in the priority list' (page 1-2). Such a decision outside the DQO process is inappropriate especially as the DQO was written to address this particular safety issue. ◦ 1985 data used as a basis for chemical inventory determination. Use of pre-May 1989 data is not allowed by the TPA and use of the 1985 is inappropriate in this instance. ◦ Sample recovery was poor which questions the representativeness of the data in describing the tank contents. Poor recovery indicates a serious deficiency in the data and is inadequate basis for a TCR. ◦ QA/QC requirements are not met.
TY-106 (inadeq.)	<ul style="list-style-type: none"> ◦ Limited new data as only the Safety Screening was applied. ◦ Sample recovery was poor which questions the representativeness of the data in describing the tank contents. Poor recovery indicates a serious deficiency in the data and is inadequate basis for a TCR. ◦ 1985 core sampling data used in inventory determination and as the basis for decisions reached concerning this tank. The use of pre-May 1989 is expressly prohibited by the TPA. Therefore the conclusions reached are not supported by the appropriate data.
U-201 (inadeq.)	<ul style="list-style-type: none"> ◦ Limited new data as only Safety Screening DQO applied. ◦ Historical modeling data used to produce a chemical inventory of the tank. This practice is not allowed until the modeling results are verified. ◦ QA/QC requirements not met. ◦ Sample recovery was poor which questions the representativeness of the data in describing the tank contents. Poor recovery indicates a serious deficiency in the data and is inadequate basis for a TCR.
U-202 (inadeq.)	<ul style="list-style-type: none"> ◦ Limited new data as only Safety Screening DQO applied. ◦ Historical modeling data used to produce a chemical inventory of the tank. This practice is not allowed until the modeling results are verified. ◦ QA/QC requirements not met.
U-203 (inadeq.)	<ul style="list-style-type: none"> ◦ Limited new data as only Safety Screening DQO applied. ◦ Historical modeling data used to produce a chemical inventory of the tank. This practice is not allowed until the modeling results are verified. ◦ QA/QC requirements not met.

U-204	<ul style="list-style-type: none">◦ Limited new data as only Safety Screening DQO applied.◦ 1978 core sampling data used to produce a chemical inventory of the tank. This is expressly prohibited by the TPA as no data pre-May 1989 may be used to meet regulatory requirements such as the TPA.◦ QA/QC requirements not met.
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