



Report of the Review of the Hanford Tank Closure & Waste Management Environmental Impact Statement (EIS)

October 2006

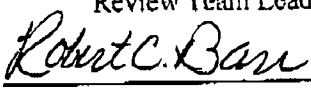
**Hanford Tank Closure and Waste Management Environment
Impact Statement (EIS)**

Review Report

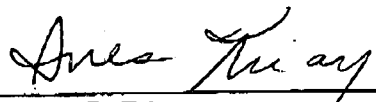
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Executive Summary

As part of the litigation involving receipt of offsite waste and the *Hanford Solid Waste Environmental Impact Statement* (HSW-EIS), the Court allowed the State of Washington a limited amount of discovery pertaining to iodine-129, technetium-99, and groundwater analyses. While compiling information to respond to the State discovery request, Battelle discovered three data quality issues within the data sets used for the cumulative groundwater impact analysis. DOE and Ecology settled the lawsuit by entering into a negotiated agreement to combine the scope of the *Environmental Impact Statement for the Retrieval, Treatment, and Disposal of Tank Waste and Closure of Single-Shell Tanks at the Hanford Site, Richland, WA* (TW-EIS) TW-EIS and the HSW-EIS into the new *Tank Closure and Waste Management Environmental Impact Statement* (TC&WM-EIS). DOE later decided to add the scope of the ongoing Fast Flux Test Facility Closure Environmental Impact Statement to the TC&WM EIS.

The team reviewed eight areas of the Hanford Source data.

1. Boring Log Summaries – Summaries are inconsistent with backup information.
2. Borehole information - not consistently captured.
3. Borehole location data – Incomplete record information
4. Downstream Boundary Condition – Data package information could not be verified
5. Incorrect Well Locations – Borehole location data inconsistent with actual locations
6. Hydraulic Head – Unknown if data can be verified. This issue is currently being reviewed to determine the exact nature of the calculations.
7. Columbia River Elevation Stage – Data conversion was incorrect.
8. Artificial Recharge – Data package information did not match historical information.

The National Environmental Policy Act (NEPA) review of the TC&WM-EIS was focused on evaluating the following factors with respect to the EIS preparation:

- Whether the NEPA Compliance Officer (NCO) was fulfilling the NCO responsibilities of DOE Order 451.1B with respect to this EIS.
- Whether the DOE NEPA Document Manager (NDM) was fulfilling the NDM responsibilities of DOE Order 451.1B with respect to this EIS, in particular the responsibilities to:
 - Verify the quality of the data that has been gathered to date to support the EIS analyses.
 - Decide how potential uncertainties would be addressed in the context of the EIS analyses.
 - Decide how cumulative impacts would be addressed in the context of the EIS analyses

The team also reviewed two programmatic areas that play a role in the development of the TC&WM EIS.

- Office of River Protection (ORL) TC&WM EIS QA Program
- SAIC's TC&WM EIS QA Program

The results of the review are as follows:

The Team identified minor programmatic QA issues in both the Office of River Protection and SAIC's implementation of QA requirements:

- The ORP TC&WM QA, Records Management, and Document Control Plans had not yet been revised to reflect the requirements of 414.IC or to reflect the new scope of the TC&WM EIS. The Team found the TC & WM EIS team had just started making revisions just before the audit started.
- The ORP TC&WM QA Plan does not address the organizational structure, functional responsibilities, levels of authority, or interfaces for the TC & WM EIS project.
- The SAIC Project Management Plan and Quality Management Plan for the TC&WM project have not been updated since 2003 and do not reflect the addition of the Hanford Solid Waste EIS.
- The records management process does not adequately control access to or protect the Administrative Record (AR).
- The Hanford Well Information System (HWIS) was found to be inaccurate because duplicate records and missing data were identified.
- The Team noted fifteen DOE QA topical areas reviews had been completed since 2003; however, no QA oversight of the TC EIS or the TC & WM EIS activities by the ORP QA group had occurred since their review of the original QA Plan. RL had performed QA surveillances prior to this review but it must be noted that RL does not have responsibility for the TC&WM EIS.

Eight issues ("problems") were identified in the review plan. Attachment 1 of the review plan provides the status of these issues as of April 2006. After several conversations with the EIS team the Team has concluded that the HWIS data base has many errors and omissions, and is generally difficult to use. Four of the eight issues (numbers 1, 2, 3, and 5) constitute really one issue, i.e., the inadequacy of the HWIS data base. The TC & WM EIS project has used about 20 individuals working for 6 months to correct these data.

The other four issues resulted from different data needs or the lack of communication between the HSW EIS and the TC & WM EIS teams. Issue #4 (location of the Columbia River shore) resulted from the different data needs of the CFEST model and has been resolved by a GPS survey by the TC & WM EIS team. Issue #6 resulted from the lack of availability of the basis of the hydraulic head data. After obtaining the background measurements for the calculations from PNNL, the data were found to be essentially correct with slightly over 5% discrepancies between the HYDRODAT reported top of casing elevations and the corresponding information in HWIS. Issue #7 is no longer an issue for the TC & WM EIS project because this project will use river elevation data obtained directly from the Corps of Engineers. Issue #8 arose because the STOMP model for the vadose zone used by the TC & WM EIS project has been modified and the data base being used is different than that contained in PNNL's February 2006 groundwater data package. The TC & WM EIS project has computed its own "flux to the water table" data and the issue has thus been resolved.

Training the TC &WM EIS Document Manger has been performed and is adequate. The following training has been completed by the TC &WM EIS Document Manger:

- 32 hours of Document Manager OJT performed at the Idaho Operations Office.
- Training in Records Management
- Required reading including:
 - Project plans and procedures
 - Applicable DOE Orders
 - Settlement Agreement - Washington vs. Bodman
 - HSW EIS Review Report
 - EIS Comment Response and EIS Distribution

The data developed to date, based on the processes in place to verify the accuracy of source data, is sound and will be adequate to support DOE decision-making in the context of this EIS. In particular, based on the results of the review of the geologic/groundwater data quality issues and the steps the EIS team has taken to identify and address those issues, the data will provide an adequate basis for the flow and transport calculations that are essential to determining the long term impacts of the proposal.

In reviewing one available data package, the Team noted that the evidence that comments of non SAIC reviewers had been addressed was not included in the data package (procedure does not require them to be in data package), although a separate document did show that these comments had been addressed.

Recommendations

Office of River Protection

It is recommended that the oversight of the ORP NEPA program/Contractor NEPA program be included in the ORP oversight plan to ensure compliance of the NEPA program with applicable requirements.

It is recommended that the ORP TC&WM EIS QA Plan and implementing procedures be updated to reflect the current organization and internal operations.

It is recommended that ORP revise their TC&WM EIS records management procedure to comply with the requirements of DOE O 441.1 C "Quality Assurance."

It is recommended that ORP provide corrected HWIS information to RL so RL can direct the update of the HWIS.

The NEPA Document Manager reviewed these recommendations during the closeout and agreed they should be addressed in the updates to the procedures.

SAIC

It is recommended that the documentation that identifies comments of non SAIC reviewers be included in all data packages, and that the applicable SAIC procedures be revised to require such inclusion.

It is recommended that SAIC perform periodic internal QA audits and surveillances based on a schedule that's not tied to project milestones.

It is recommended that SAIC control the Administrative Record to prevent damage and loss.

It is recommended that SAIC update the TC&WM Project and Quality Management Plans to reflect the added scope of work.

Richland Operations Office

It is recommended that RI ensure the HWIS is updated to reflect current well information.

1.0 BACKGROUND

In January 2003, DOE started to prepare the Tank Closure EIS which included closure of the 149 underground SSTs and newly available information on supplemental treatment for the LAW. In January 2004, DOE issued the Hanford Solid Waste EIS and a ROD (69 FR 39449), which addressed ongoing solid waste management operations, and announced DOE's decision to dispose of Hanford and offsite LLW and MLLW in a new Integrated Disposal Facility in the 200-East Area of Hanford.

Washington State Department of Ecology filed suit against the Hanford Solid Waste EIS. During the lawsuit (*State of Washington v. Bodman* [Civil No. 2:03-cv-05018-AAM]) while preparing responses to discovery requests from Ecology, several differences in groundwater analyses between the HSW EIS and its underlying data. DOE notified the Court and Washington State and, in September 2005, and convened a team of DOE experts in quality assurance and groundwater analysis, as well as transportation and human health and safety health impacts analysis, to conduct a quality assurance review of the HSW EIS. The team completed its Report of the Review of the Hanford Solid Waste Environmental Impact Statement (EIS) Data Quality, Control and Management Issues, January 2006 (hereafter referred to as the Quality Review).

DOE and Ecology announced a Settlement Agreement ending the NEPA litigation on January 9, 2006. The agreement is intended to resolve concerns about HSW EIS groundwater analyses and to address other concerns about the HSW EIS, such as those identified in the Quality Review. The Agreement expanded the TC EIS to provide a single, integrated set of analyses that will include all waste types analyzed in the HSW EIS (LLW, MLLW, and TRU waste). The expanded EIS was renamed the TC & WM EIS. Pending finalization of the TC & WM EIS, the HSW EIS will remain in effect to support ongoing waste management activities at Hanford (including waste transportation off site such as TRU waste shipments to WIPP) in accordance with applicable regulatory requirements. The Agreement stipulates that when the TC & WM EIS has been completed, it will supersede the HSW EIS. Until that time, DOE can not rely on HSW EIS groundwater analyses for decision-making, and DOE will not import offsite waste to Hanford, with certain limited exemptions as specified in the Agreement.

As part of the Agreement it was agreed that the TC & WM EIS would review its processes for lessons learned related to the Quality Review. As part of this process EM-3 requested that a review team come out and look at the TC & WM EIS to evaluate the EIS efforts to date and the path forward.

2.0 REVIEW APPROACH

The initial review will evaluate the work done by the TC & WM EIS team using site source data to set up MODFLOW. For work on the TC & WM EIS and other contractors work on site (i.e., Fluor Hanford or PNNL) evaluations will be conducted against procedures currently in place for those companies related to data management and configuration control.

The source data quality issues identified to date by the TC & WM EIS team are listed below.

1. Boring Log Summaries – Summaries are inconsistent with backup information.
2. Borehole information - not consistently captured.
3. Borehole location data – Incomplete record information
4. Downstream Boundary Condition – Data package information could not be verified

5. Incorrect Well Locations – Borehole location data inconsistent with actual locations
6. Hydraulic Head – Unknown if data can be verified. This issue is currently being reviewed to determine the exact nature of the calculations.
7. Columbia River Elevation Stage – Data conversion was incorrect.
8. Artificial Recharge – Data package information did not match historical information.

The DOE review team will include subject matter experts with respect to:

- EIS development
- Process methodology
- Quality assurance
- Data quality management.

SAIC will provide data and information as requested to support the DOE review team. Other site subject matter experts may be identified during the course of the review.

3.0 SUMMARY

A review was conducted at the Richland Operations Office on the TC & WM EIS in Richland, Washington from June 26 to June 30, 2006. The primary objective of this review was to identify source data quality issues, NEPA compliance and QA program issues as they are related to the TC & WM EIS.

This report is broken into three subject areas:

- Quality Assurance Programmatic Issues
- NEPA Compliance
- Source Data Quality Issues

The following QA programmatic issues were identified as a result of the review:

Office of River Protection

The ORP TC & WM EIS QA program was assessed to determine compliance with applicable DOE Directives and to address weaknesses in the program that could contribute to data errors or loss. The review discovered that several of the TC EIS program implementing plans and procedures were out of date and have not been revised in over three years. The review found that the EIS procedures reflected the TC-EIS which began in 2003, and were being revised to reflect the new TC&WM scope which begun in January 2006. The Team found the TC & WM EIS plans and procedures that were in draft did not address all the QA requirements of DOE 414.1C. The items which were missing were reviewed with the NEPA Document Manager and it was agreed they needed to be included in the procedure updates. Although 15 DOE QA reviews had been done since 2003 they focused on specific topical areas.

The TC & WM EIS QA program has not been reviewed by the Office of River Protection since the QA Plan was approved in April 2003. Federal QA oversight is an important tool, if used, to ensure compliance with project QA requirements.

Richland Operations Office

A portion of the source data quality issues are attributed to the inaccuracy of the Hanford Well Information System (HWIS). This data base is maintained by a RL contractor and needs to be updated to reflect current well status at the Hanford site. During its review, the TC & WM EIS team had discovered duplicate records and missing wells in the HWIS data base. The HWIS is an important source of well data for the Hanford site, used by many projects, and needs to provide accurate well data.

SAIC

The SAIC TC & WM EIS Project was assessed to determine if adequate quality assurance controls were implemented to assure the quality of the HSW EIS data. Under its contract with DOE, SAIC is required to implement an appropriate QA program. SAIC has the required QA program in place but have not fully implemented it. The two items below address the items which need to be fully implemented. The Administrative Record (AR) is not adequately protected and access to the AR has not been defined. Audits of the QA program have not been performed as required by SAIC procedure QAAP 18.1 "QA Audits." QAAP 18.1 requires that QA audits be scheduled and performed but the schedule provided to the team dated 5/23/06 does not list a QA audit. The SAIC Project Management Plan and Quality Management Plan for the TC&WM project have not been updated since 2003 and do not reflect the addition of the Hanford Solid Waste EIS.

The following NEPA Compliance issues were identified during the review:

In reviewing one available data package, it was noted that the evidence that comments of non SAIC reviewers had been addressed was not included in the data package, although a separate document did show that these comments had been addressed. (Note: Per the TC&WM data management procedure does not require that the comments be included in the data package)

The following source data quality issues were reviewed:

Evaluate the problems identified to see if the review team would come to the same conclusion.

Eight issues ("problems") were identified in the review plan by the EIS team in going through the QA process for the TC&WM EIS, and Attachment 1 of the review plan provides the status of these as of April 2006. After several conversations with the TC & WM EIS team the Team concluded that the HWIS data base has many errors and omissions, and is generally difficult to use. Four of the eight issues (numbers 1, 2, 3, and 5) constitute really one issue, i.e., the inadequacy of the HWIS data base. The TC & WM EIS project has used about 20 individuals working for 6 months to correct these data. This reviewer thus has

reached the same conclusion regarding the HWIS data base problems and the need to fix the data base so that it can be satisfactorily used for other groundwater projects at the Hanford site.

The other four issues resulted from different data needs or the lack of communication between the data provider and the TC & WM EIS teams. Issue #4 (location of the Columbia River shore) resulted from the different data needs of the CFEST model and has been resolved by a GPS survey by the TC & WM EIS team. Issue #6 resulted from the lack of availability of the basis of the hydraulic head data. After obtaining the background measurements for the calculations from PNNL, the data were found to be essentially correct with slightly over 5% discrepancies between the HYDRODAT reported top of casing elevations and the corresponding information in HWIS. Issue #7 is no longer an issue for the TC & WM EIS project because this project will use river elevation data obtained directly from the Corps of Engineers. Issue #8 arose because the STOMP model for the vadose zone used by the TC & WM EIS project has been modified and the data base being used is different than that contained in PNNL's February 2006 groundwater data package. The TC & WM EIS project has computed its own "flux to the water table" data and the issue has thus been resolved.

The problems identified to date are one time occurrences or a system problem.

The problems with the HWIS data base represent a system wide problem because after many years of groundwater studies at the Hanford site, there should have been a reliable, complete, user-friendly data base of the subsurface and groundwater parameters. It should, however, be kept in mind that this really is one problem and not eight, and it can and should be easily fixed.

The other perceived problem at the project, i.e., different modeling efforts resulted in different flow paths from the site to the river, is not a result of using one computer code (e.g. CFEST) or the other (e.g. MODFLOW) and will therefore not be resolved by the use of a particular code. The differences were mainly due to different conceptual models and data sets used. It is quite possible, for example, that the current (TC & WM EIS) modeling effort results in a probability of some of the flow going north. The effort should be to use reliable quality assured data, robust peer-reviewed conceptual models, and a reliable computer code, and let the results yield what they may. This reviewer agrees with the decision to use one computer code for all groundwater analyses at the site; one that is easily available and has been used for many years and on many projects. MODFLOW is a sound choice from those considerations.

Confirm that existing TC & WM EIS processes and procedures are identifying correct actions while procedures are being updated.

This reviewer reviewed only the technical data and actions and not the Q.A procedures. The knowledge, background and dedication of key technical personnel (Charles Hostetler, Joe Price and Tom Gardner Clayson) on this project are impressive. The groundwater and waste form release modeling efforts are advancing satisfactorily. Much of the data needed has been collected, verified and reduced to go in the model as input parameters. The project is behind schedule due to HWIS data base problems, but is attempting to catch up.

4.0 REVIEW RESULTS

4.1 Office of River Protection

The Team found that several of the TC & WM EIS QA, Records Management (I went back and checked Records management procedures was on Rev 2 and had been updated in Dec 2003. Rev 0 was December 02, Rev 1 was April 03 and Rev 2 was December 03 so they had been revised

but this issue was not caught therefore I suggested the changes below), and Document Control Plans had not been updated to reflect the requirements of DOE Order 414.1C. A draft revision of the TC & WM EIS QAP was reviewed and had not addressed the following required items:

- The organizational structure
- The process for detecting and preventing quality problems
- The process for evaluating suppliers was not defined

The Team noted the TC EIS QA program has not been reviewed by ORP QA group since approving the QA Plan in April 2003. However, at the request of the NEPA Document Manager 15 reviews of the project or data specific QA efforts have occurred since 2003 these include the following:

- Review of QA Plans for NEPA Documents for ORP TC&WM EIS. ORPs response to J. Shaw's memo (ES&H) dated 1/10/06. (1/27/2006)
- Review of WIDS library for 100 and 200 area purple waste sites (1/31/2006)
- Review of hydrodat data (4/28/2006)
- Review of Documentation and Adequacy of Implementing Plans and Procedures (6/23/2006)

The Team considers Federal oversight an important aspect of ensuring compliance with project requirements. The TC & WM EIS program needs to coordinate with the ORP QA group to ensure that scheduled Federal QA oversight of the TC & WM EIS project is performed.

The draft process for the TC & WM EIS control of documents and records was reviewed and does not meet the QA requirements of DOE O 414.1C. At the close-out of the review the NEPA document manager understood the item which was missing in the procedures and agreed they needed to be included in the updates. These included:

- Requirements for the access control to documents.

Training the TC & WM EIS Document Manger has been performed and is adequate. The following training has been completed by the TC & WM EIS Document Manger:

- 32 hours of Document Manager OJT performed at the Idaho Operations Office.
- Training in Records Management
- Required reading including:
 - Project plans and procedures
 - Applicable DOE Orders
 - Settlement Agreement - Washington vs. Bodman
 - HSW EIS Review Report
 - EIS Comment Response and EIS Distribution

4.2. SAIC

The SAIC TC & WM EIS Project was assessed to determine if adequate quality assurance controls were implemented to assure the quality of the HSW EIS data. Under its contract with DOE, SAIC is required to implement an appropriate QA program. SAIC has the required QA program in place but have not fully implemented it.

The Administrative Record (AR) is not adequately protected and access to the AR has not been defined. The AR is stored in open metal book cases where fire or activation of the sprinkler system could damage or destroy it. There was no posting or indication of who had access to the AR.

Audits of the QA program have not been performed as required by SAIC procedure QAAP 18.1 "QA Audits." QAAP 18.1 requires that QA audits be scheduled and performed but the schedule provided to the team dated 5/23/06 does not list a QA audit.

The SAIC Project Management Plan and Quality Management Plan for the TC&WM project have not been updated since 2003 and do not reflect the addition of the Hanford Solid Waste EIS.

4.3. Columbia Energy & Environmental Services (CEES)

CEES provide data packages to the TC & WM EIS project as requested by the TC & WM EIS team. The CEES Quality Assurance Manual was reviewed and meets the requirements of DOE O 414.1A.

It was noted during the review that CEES QA personnel performed a comprehensive documented review of the Hanford Solid Waste EIS Review Report, shortly after it was issued, to incorporate lessons learned into the CEES QA program. This review is identified as a **Best Management Practice**.

4.4. NEPA Compliance

The National Environmental Policy Act (NEPA) review of the TC&WM-EIS was focused on evaluating the following factors with respect to the EIS preparation:

- Whether the NEPA Compliance Officer (NCO) was fulfilling the NCO responsibilities of DOE Order 451.1B with respect to this EIS, in particular the responsibilities to:
 - Advise on NEPA-related matters
 - Assist with the NEPA process and document preparation
 - Advise on the adequacy of NEPA documents and other related documents
- Whether the DOE NEPA Document Manager (NDM) was fulfilling the NDM responsibilities of DOE Order 451.1B with respect to this EIS, in particular the responsibilities to:
 - Establish a team, to plan, assist in preparing, and review documents
 - Manage the document preparation process, including reviewing internal drafts for technical adequacy, and maintaining schedule
- The quality of the data that has been gathered to date to support the EIS analyses
- How potential uncertainties would be addressed in the context of the EIS analyses
- How cumulative impacts would be addressed in the context of the EIS analyses

The NCO has just been chosen to replace the former NCO, who recently retired. The previous NCO was an employee of the Richland Office, but served as the NCO for both the Richland Office (RL) and the Office of River Protection (ORP). The NCO position is in the process of being transferred from RL to the ORP, since the bulk of the future NEPA work at Hanford is expected to support the ORP mission. The new NCO is an experienced NEPA practitioner, is aware of his responsibilities under DOE Order 451.1B, and indicated that he would fulfill his responsibilities to advise and assist in the preparation of the TC&WM-EIS. Since the NCO had just been appointed, there was no information that would allow the review team to judge how effectively he might discharge his responsibilities with regard to this EIS in the future.

The NDM is aware of her responsibilities under DOE Order 451.1B and is fulfilling those responsibilities adequately. She has established an effective team to plan, prepare, and review the document and is actively managing the document preparation process to avoid the type of problems that were encountered by the HSW-EIS, as evidenced by the discovery and addressing of potential data quality issues that are discussed in depth in the section of this report discussing geologic/groundwater data issues. The process of addressing those geologic/groundwater data quality issues has delayed the schedule by approximately 6 weeks, but the schedule delay is much less than the approximately 6 months work taken to address the data quality issues. Overall the schedule is being well managed under the circumstances. However, since the TC&WM-EIS schedule has been timed to coordinate with other activities throughout the DOE complex, the NDM should be vigilant to prevent further schedule delays and take advantage of any opportunities to get the project back on its original schedule.

The data developed to date, based on the processes in place to verify the accuracy of source data, is sound and will be adequate to support DOE decision-making in the context of this EIS. In particular, based on the results of the review of the geologic/groundwater data quality issues and the steps the EIS team has taken to identify and address those issues, the data will provide an adequate basis for the flow and transport calculations that are essential to determining the long term impacts of the proposal.

In reviewing one available data package, it was noted that the evidence that comments of non SAIC reviewers had been addressed was not included in the data package, although a separate document did show that these comments had been addressed. It is recommended that the documentation that comments of non SAIC reviewers be included in all data packages, and that the applicable SAIC procedures be revised to require such inclusion.

Since there is often some degree of uncertainty inherent in computer modeling of the type of complex systems involved in groundwater flow and transport, the team inquired about the planned approach to addressing uncertainties in the EIS analysis. The EIS team plans to identify any uncertainties that might be substantial enough to impact the DOE's decision based on the EIS analysis. This approach is appropriate and would enable the decision maker to consider any uncertainties in reaching a decision based on the EIS analysis.

Since there are a number of other activities planned or in progress at the Hanford site that could have an impact on groundwater flow and transport, the team inquired about the scope of the planned cumulative groundwater flow and transport impacts analysis. The EIS team indicated that they plan on examining the impacts of these other activities (e.g. cleanup activities conducted under CERCLA) as part of the cumulative impacts analysis. The scope of activities that would be analyzed to determine the cumulative impacts of groundwater flow and transport is appropriate.

4.5. Source Data Quality

Issues 1 and 2: Boring Log Summaries and Borehole Information

Hanford Well Information System (HWIS) is a computer data base maintained by Fluor. It was created in 2002-03 from previous data bases and new information. There are 7897 records listed in HWIS. Approximately 500 of these are duplicate records, some of the others contain no data, and some contain very little data. SAIC has found 3878 logs from HWIS and 996 others from PNNL's Boring Log Library and literature, for a total of 4874 well log records that they plan to use in the TC & WM EIS. PNNL used 800 well logs for the HSW EIS.

For some wells, HWIS contains a "primary" record, i.e., field geologist's notes made at the well. For many wells, however, only a summary record is available that provides interpretation of the "primary" log of well site examination of cuttings and cores. In most cases, the summary corresponds with the primary record. However, out of a random sample of approximately 500 primary records, 6% of the time the summary did not correspond with the primary record regarding the lithology and depth of the contacts. One example was of a well (# 299-E34-5) for which the summary (generalized stratigraphy) did not include the depth to Basalt while the detailed geological log has an entry, "Driller thinks he hit basalt @ 191-192" at the end of the log.

SAIC is in the process of checking the primary records from the Boring Log Library for wells for which the HWIS contains only a summary. The summary information is revised when a discrepancy is found.

Information on new wells is continuously added to the HWIS database. However, there does not appear to be a formal process to accomplish this task. As far as this reviewer has been able to determine, several organizations drill at the Hanford site, but there is no one uniform requirement for collecting subsurface data, no single format for reporting this data, and no uniform process for reporting the data to HWIS or another groundwater and subsurface database. Apparently, the information is exchanged at a Monday morning weekly meeting of several contractors and DOE (RL).

Issues 3 and 5: Incomplete and Incorrect Borehole Location Data

As stated above, HWIS database is incomplete and difficult to use. However, it is generally reliable for well locations. The problem with the location of wells is encountered in the Department of Ecology database. SAIC has checked the location of about 100 wells through a survey along the river and in the 1100 and 3000 areas with hand-held GPS. This survey confirmed that the HWIS location data is accurate while problems exist with the data from the Washington State Department of Ecology.

There are approximately 700 boreholes in the Department of Ecology database. SAIC has corrected the location of approximately 550 of these, based on a review of additional optional information from the drillers contained in the Department of Ecology records.

SAIC will assign uncertainties in the individual data points to be used in modeling.

Issue 4: Location of the Columbia River

The Columbia River represents the downstream boundary condition in both the CFEST model used by PNNL and the MODFLOW to be used by SAIC.

A plot of the coordinates of the fixed head nodes in the PNNL February 2006 data package yields a jagged near shoreline of the Columbia. This is due to CFEST being a Finite Element code. To achieve a Data Quality Objective (DQO) of 25 meters for each coordinate, SAIC conducted a GPS survey to record the coordinates of near shore of the Columbia River. The problem with the data is thus understood and the solution has been implemented.

Issue 6: Hydraulic Head

This issue arose because HWIS does not always include the "Depth to Water" parameter. Since the hydraulic head is computed by subtracting the depth to water distance from the elevation of the top of the well above a datum, initial effort by SAIC to validate the hydraulic head data were unsuccessful. SAIC now confirms that the HYDRODAT database adequately represents the depth to water measurements that SAIC examined in archival records. They confirm that the mathematics of the conversion from depth to water to hydraulic head is performed correctly in HYDRODAT. They found slightly over 5% discrepancies between the HYDRODAT reported top of casing elevations and the corresponding information in HWIS. This is slightly outside the SAIC's data quality objective. The project team will ask DOE for a recommendation on which data set to use in the final analysis. The issue was with the formatting of the HWIS database. As of May 2006, HYDRODAT data base is documenting the basis for the hydraulic head data. Thus, this issue is resolved.

Issue 7: Columbia River Post – McNary Stage Elevation Data

There are two dams on the Columbia River within the modeled area. Priest Rapids dam is in the northwest corner of the area and McNary Dam is in the southeast corner. HSW EIS assumed that these dams did not exist for the long-term while the city of Richland is assumed to continue to pump water for 10,000 years. On the other hand, SAIC is planning to make a consistent assumption that the present conditions will remain for 10,000 years because of the difficulty of predicting the future. This assumption is consistent with EPA's view as expressed, for example, in 40 CFR 191. Thus, the TC & WM EIS will be based on the assumption that the two dams continue to exist and perform as at present, and the City of Richland would continue to pump water, for 10,000 years.

It is not clear whether all input data in prior groundwater modeling efforts were converted to a uniform datum (NAD27 or NAVD88). For the TC&WM EIS effort, SAIC will obtain the river stage data directly from the Corps of Engineers. Also, a conversion package is available to convert NAD27 data to NAVD88 data from the Corps of Engineers, if needed. No problems are thus foreseen regarding this issue.

Issue 8: Artificial Recharge from DOE Sources

SAIC ran test calculations with a preliminary version of their updated STOMP conceptual model to see if the combination of their "cumulative impact" inventory releases and the STOMP calculation of flux to the water table were reasonably consistent with the fluxes provided by PNNL. SAIC concluded that they were not consistent and therefore the fluxes provided by PNNL cannot be directly used in the MODFLOW model for TC & WM EIS. The reason for this appears

to be that PNNL used a different set of parameters and inputs for STOMP. SAIC will use updated boring log data and multidimensional conceptualization.

5.0 RECOMMENDATIONS

Below are the recommendations of each team member in their area of expertise. These recommendations are based on the results of the review and each team member's knowledge of the subject.

5.1. Office of River Protection

It is recommended that the oversight of the ORP NEPA program/Contractor NEPA program be included in the ORP oversight plan to ensure compliance of the NEPA program with applicable requirements.

It is recommended that the ORP TC&WM EIS QA Plan and implementing procedures be updated to reflect the current organization and internal operations.

It is recommended that ORP revise their TC&WM EIS records management procedure to comply with the requirements of DOE O 414.1 C "Quality Assurance."

It is recommended that ORP revise their TC&WM EIS document control procedure to comply with the requirements of DOE O 414.1 C "Quality Assurance."

It is recommended that ORP coordinate the update of the HWIS with RL to ensure the well data base is current.

Recommend that the ORP QA Assessment Plan should be updated to include a review of the TC&WM EIS annually until its completion.

5.2. SAIC

It is recommended that the documentation that identifies comments of non SAIC reviewers be included in all data packages, and that the applicable SAIC procedures be revised to require such inclusion.

It is recommended that SAIC perform periodic internal QA audits and surveillances based on a schedule that's not tied to project milestones.

It is recommended that SAIC adequately control the Administrative Record to prevent damage and loss.

It is recommended that SAIC update the TC&WM Project and Quality Management Plans to reflect the added scope of work.

5.3. NEPA Compliance

It is recommended that the documentation that comments of non SAIC reviewers be included in all data packages, and that the applicable SAIC procedures be revised to require such inclusion.

5.4. Source Data Quality

It is recommended that the HYDRODAT data should be available on the Hanford Intranet.

It is recommended that the HWIS be updated to correct inaccurate data. It is further recommended that procedures be developed that will ensure the HWIS data base is maintained so that accurate data will be supplied to the various project/programs at the Hanford site.

6.0 REFERENCES

DOE Directive O 414.1C Quality Assurance

DOE Directive O.451.1B "NEPA Compliance Program"

NEPA Contracting Reform Guidance, December 1996

DOE P 226.1 DOE Oversight Policy

DOE O 251.1A Directives System

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Appendix B Documents Reviewed

#	Item	Date	Rev.
1	Notice of Intent to Prepare an Environmental Impact Statement for Retrieval, Treatment, and Disposal of Tank Waste and Closure of Single-Shell Tanks at the Hanford Site, Richland, WA (68 Fed. Reg. 1052)	1/8/2003	N/A
2	Notice of Intent to Prepare the Tank Closure and Waste Management Environmental Impact Statement for the Hanford Site, Richland, WA (71 Fed. Reg. 5655)	2/2/2006	N/A
3	DOE Order 451.1B, Change 1, National Environmental Policy Act Program	9/28/2001	
4	SAIC Procedure SAIC TC EIS 03 – Tank Closure EIS Calculations and Analyses	5/15/2003	N/A
5	Data Development for the Fast Flux Test Facility Decommissioning EIS Alternatives, Science Applications International Corporation	3/2006	0
6	New or Changed Data Form #218 for the Environmental Impact Statement for Tank Closure and Waste Management at the Hanford Site, Richland, WA, RL and SAIC concurrence on disposition of RL comments on the draft SAIC Report “ <i>Data Development for the Fast Flux Test Facility Decommissioning Environmental Impact Statement Alternatives.</i> ”	4/19/2006	N/A
7	Columbia Energy & Environmental Services CE-M-001 Quality Assurance Manual	4/17/2006	11
8	Office of River Protection Description/Statement of Work	-	13
9	The Environmental Impact Statement for Retrieval, Treatment, and Disposal of Tank Waste and Closure of Single-Shell Tanks Project: Quality Assurance Plan.	4/8/2003	1
10	The Environmental Impact Statement for Retrieval, Treatment, and Disposal of Tank Waste and Closure of Single-Shell Tanks Project: Records Management and Document Control	12/1/2003	2
11	The Environmental Impact Statement for Retrieval, Treatment, and Disposal of Tank Waste and Closure of Single-Shell Tanks at the Hanford Site, Richland Washington, Project Management Plan, SAIC TC EIS 01	5/5/2003	0
12	The Environmental Impact Statement for Retrieval, Treatment, and Disposal of Tank Waste and Closure of Single-Shell Tanks at the Hanford Site, Richland Washington, Quality Management Plan, SAIC TC EIS 02	5/5/2003	0
13	TC & WMEIS Quality Assurance Plan	-	Draft
14	SAIC QAAP 6.1 Controlled Documents	7/3/2002	5
15	SAIC QAAP 16.1 Corrective Action	3/13/2002	3
16	SAIC QAAP 17.1 Records Management	3/24/2004	9
17	SAIC QAAP 18.1 QA Audits	8/21/2001	5
18	SAIC QAAP 18.3 Surveillances	8/21/2001	4

#	Item	Date	Rev.
19	SAIC QAAP 18.4 Client Assessments	03/21/2006	3
20	Review Plan for the Tank Closure and Waste Management EIS Data Conversion Efforts from CFEET to MODFLOW	June 19, 2006	-
21	Report of the Review of the Hanford Solid Waste Environmental Impact Statement (EIS) Data Quality, Control and Management Issues	January 2006	-
22	Final Hanford Site Solid (Radioactive and Hazardous) Waste Program Environmental Impact Statement Richland, Washington (Summary Vol.; Vol. 1, Sections 1-7; Vol. 2, Appendices A-O)	January 2004	-
23	Settlement Agreement re: Washington v. Bodman, Civil No. 2:03-cv-05018-AAM	January 6, 2006	-
24	Tank Closure & Waste Management Environmental Impact Statement – Integrated Senior Management Team, Mary Beth Burandt, NEPA Document Manager, Presentation	-	-
25	Technical Guidance Document for Tank Closure Environmental Impact Statement Vadose Zone and Groundwater Revised Analysis	March 25, 2006	0
26	Tank Closure EIS Calculations and Analyses, SAIC Implementing Procedure Number SAIC TC EIS 03	May 15, 2003	0
27	Summary of Hanford Site Groundwater Monitoring for Fiscal Year 2005, PNNL	March 2006	-
28	Evaluation of the PNNL Base-Case Flow Field for the Tank Closure Environmental Impact Statement (TC EIS) Calculation of Groundwater Impacts, TCEIS Team	-	-
29	Evaluation of Lateral Spreading in High- and Low-Liquid Volume Discharges: Effects of Dimensionality, TC&WM EIS Team	-	-
30	Groundwater Data Package for Hanford Assessments, P.D. Thorne, et al., PNNL-14753	January 2006	-
31	TC & WM EIS Waste Form Release Models, Presentation by Joe Price, SAIC	June 21, 2006	0
32	Hanford TC and WM EIS Project Draft – Proposed Schedule Activities thru Record of Decision.	-	-