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SUBJECT: **ACTION PLAN FOR THE EXTERNAL ADVISORY GROUP SEMI-ANNUAL REPORT DATED DECEMBER 2000**

Attached is the Action Plan addressing comments and recommendations given by the External Advisory Group in their Semi-Annual Report dated December 2000.

This report is being sent to you because you have received a copy of the Laboratory's Hydrogeologic Workplan and a binder for the Annual Reports and meeting minutes, or have requested to be on the distribution list. If you are not interested in continuing to receive these materials, please contact me at the address or telephone number listed above.

If you have any questions, please submit them to Charlie Nylander at (505) 665-4681 or nylander@lanl.gov.

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**Los Alamos National Laboratory
Groundwater Integration Team**

Action Plan

for

**External Advisory Group
December 2000 Recommendations**

March 15, 2001

General

HSWA LANL G/M/HWP/2001

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INTRODUCTION

This Action Plan addresses the recommendations in the External Advisory Group's (EAG) fifth semi-annual report, "Semi-Annual Report to the Groundwater Integration Team of the Los Alamos National Laboratory by the External Advisory Group", dated December 5, 2000. The EAG was established in October 1998 to provide a periodic external assessment of Los Alamos National Laboratory's (LANL or Laboratory) Hydrogeologic Characterization Program and the implementation of proposed characterization activities.

This is the fifth Action Plan written to address the EAG recommendations. This Action Plan addresses the recommendations from the EAG December 2000 report. Recommendations from the previous EAG semi-annual reports dated November 1998, July 1999, December 1999, and March 2000 are included in Appendix A.

EAG DECEMBER 2000 RECOMMENDATIONS AND GIT PROPOSED ACTIONS

The following section provides a description of each EAG recommendation paraphrased from the December 2000 Semi-Annual Report, and the LANL Groundwater Integration Team (GIT) proposed action for addressing the recommendation. Each recommendation is provided a "tracking" number that includes the month and year of the EAG report from which it was taken. A summary table of each of the recommendations and proposed actions is provided (Table 1). The summary table also provides a crosswalk to previous EAG recommendations (November 1998, July 1999, December 1999, and March 2000 Semi-Annual Reports) that are similar.

MANAGEMENT AND GLOBAL ISSUES – Program Management

Recommendation 12-00-1: Communications should continue to be prompt, open, and regular.

The EAG noted that the Program Manager and GIT are patient, thorough, and exhaustive in communicating to stakeholders, and the management of trust issues appears appropriate. The EAG responded to the upper management request for advice in conducting communications with stakeholders: 1) timely, verbal communication of data to those most impacted; 2) communication should be using appropriate judgement with preliminary data; 3) communications should be formatted for appropriately for the audience; 4) communicate on a regular basis; 5) joint communication with the Laboratory and regulatory agencies; and 6) request feedback regarding the effectiveness of the communication.

Proposed Action 12-00-1:

The Program Manager and the GIT intend to continue the communication efforts established in the Hydrogeologic Characterization Program. The Program Manager will request that the EAG solicit feedback from the stakeholders on how to improve communications during the stakeholder session at the March 2001 Annual Meeting.

Recommendation 12-00-2: R-25 should be sampled quarterly and its disposition determined in about one year.

NMED has expressed concern about the quality of data generated from well R-25. The EAG expresses some concern; however, feels that plugging and abandoning well R-25 is premature at this time. With the Westbay system installed, the EAG recommends quarterly sampling of the well for a year with reevaluation of disposition at the end of the year.

Proposed Action 12-00-2

The GIT concurs with this recommendation and has included it in the letter responding to NMED's letter regarding R-25.

Recommendation 12-00-3: The contracting schedule slippage needs to be addressed.

Due to delays in contracting drilling activities, the drilling schedule has slipped. The EAG recommends that Laboratory management address the issues and eliminate slippage.

Proposed Action 12-00-3

In FY00 the delays in drilling were largely related to budget impacts from the Cerro Grande fire. At the October 2000 Quarterly Meeting, the Program Manager reported that delays in contracting had impacted the FY01 planning, but this in itself has not resulted in a delay of the drilling schedule. A drilling "time out" was instituted in FY01 to address deficiencies identified in the Management Assessment Report for Groundwater Investigations Focus Area and to optimize the drilling schedule with respect to the funding profile for FY01 and FY02.

Recommendation 12-00-4: The next meeting will include a working meeting for managers.

EAG has expressed a desire for a working session prior to the management out briefing to discuss topics of concern. The EAG suggests polling meeting attendees prior to the annual meeting to discern immediate concerns for working session preparation.

Proposed Action 12-00-4

A working meeting for managers has been scheduled for Monday, March 19, associated with the Annual Meeting. The focus of the senior manager meeting is the revised groundwater protection strategy and issues for senior management attention.

Recommendation 12-00-5: Skills in matrix management need some development.

EAG recognizes the inherent difficulties in matrix management systems, such as conflicting priorities across organizations as well as budget restrictions. The conflicts are best resolved by open confrontation, and the Program Manager is skilled at facilitating this type of environment. At a recent management meeting, the EAG noted a reluctance to follow a matrix management system. Managers must come to agreement in the sharing of power over resources and the approach to conflict resolution.

Proposed Action 12-00-5

The GIT agrees that matrix management at LANL, DOE, and NMED affects implementation of the Hydrogeologic Characterization Program. This is an issue for senior management attention that will be discussed at the March 19 senior manager meeting.

MANAGEMENT AND GLOBAL ISSUES – Management and Stakeholder Issues**Recommendation 12-00-6: Definitions of modeling uncertainty are desirable.**

The EAG requested the GIT to better define uncertainties in modeling data, such as infiltration, hydraulic conductivity, and porosity. Defining uncertainties in geochemical and geologic parameters will join hydrologic parameters. The use of default numbers will be reviewed for each instance of application. It is the goal of the Laboratory to use measured site-specific data for model input parameters.

Proposed Action 12-00-6:

Uncertainties in modeling have been evaluated in FY01 for modeling activities and will continue to be evaluated in FY02. It is the goal of the Laboratory to develop probability distributions for model input parameters, confirmed by site-specific numbers, in order to address the effects of uncertainty in the modeling outputs.

Recommendation 12-00-7: Institution of the Risk Assessment Committee is necessary.

The EAG notes a delay in the establishment of a Risk Assessment Subcommittee, which will include NMED representation. Stakeholders express concern about realistic and culturally appropriate scenarios being used in Laboratory risk assessment evaluations. Stakeholders do not view "low risk" and "no risk" as synonymous, and until risk is defined, there will be discomfort with this process.

Proposed Action 12-00-7:

Risk assessment has been combined with the Hydrology Subcommittee, due to the close interaction required between these disciplines.

Recommendation 12-00-8: Displacement of post fire sampling/analyses/activities is necessary.

EAG recognizes that the NMED feels that post fire chemistry field data collection efforts are not adequate. The NMED would like the Laboratory to demonstrate complete coverage of the watershed for surface water and groundwater post fire chemistry. NMED also expressed concern that there is no individual or group taking responsibility for fire-related efforts. The Program Manager stated a need to coordinate efforts for post fire activities.

Proposed Action 12-00-8:

The Project Manager conducted a meeting to coordinate sampling efforts in alluvial wells in response to the concerns expressed by the NMED at the October 2000 Quarterly Meeting. Ken Mullen has been named the Program Manager for surface water issues and will be the single point of contact for surface water. Similarly, Charlie Nylander has been named the Ground Water Program Manager and will serve as the single point of contact for groundwater.

Recommendation 12-00-9: Long term stewardship of the Workplan activities is unclear.

Stakeholders have expressed concern for public safety over the long-term, particularly with the expanding operations of the Laboratory. Long-term (50 years or greater) stewardship of wells and data is necessary and should be incorporated into Laboratory decision making. The Program Manager recognizes that long-term definitions are currently five to ten years. The surveillance group will discuss this issue.

Proposed Action 12-00-9:

The Los Alamos National Laboratory Groundwater Protection Strategy has been revised to reflect comprehensive groundwater protection so that the Laboratory can fulfill the responsibility of stewards of natural resources. This revised strategy will be discussed with a goal of attaining consensus among the senior managers at the March 19 senior manager meeting.

MANAGEMENT AND GLOBAL ISSUES – Data Quality Objectives

Recommendation 12-00-10: The EAG continues to promote the use of a QAPP-type process for the Workplan that requires personnel to critically examine their portions of the Workplan to assure that DQOs are achieved efficiently and within budget.

QA processes and procedures necessary to the attainment of Workplan DQO's is being implemented using the Environmental Restoration (ER) division Quality Management Plan. The EAG stresses that a quality assurance/quality control process not only focuses on training, documentation, and accountability but also has as its primary objective a means to create a coherent pathway to achieve data quality objectives. A questionnaire-designed quality assurance project plan is suggested for the DQO driven project components.

Proposed Action 12-00-10:

The GIT agrees with the need to have a quality program for the Hydrogeologic Workplan Activities. The drilling portion of the program will continue to use the ER QAPP. The ER Project performed a QA audit of the ER groundwater focus area team (presented at the October 2000 Quarterly Meeting), and the focus area team is correcting deficiencies. The ER Project has also initiated an activity to "projectize" the Hydrogeologic Workplan to identify discrete projects, responsible parties, scope, schedules, and deliverables. The result of this effort will be a list of projects that must be brought under the QAPP umbrella. In the meantime, the GIT has taken steps to formalize communication of DQOs for individual wells.

Recommendation 12-00-11: The EAG would appreciate an involvement in peer-review of the new, or modified, SOPs prior to their full adoption by the GIT for use in the Workplan.

The EAG believes the Workplan requires new and/or modified standard operating procedures (SOPs) which would distinguish them from other Laboratory projects. The EAG would like to participate in the peer review of SOPs before they are implemented within the Workplan.

Proposed Action 12-00-11:

The EAG will be requested to peer review selected SOPs, particularly those pertaining to sampling. However, resources are not available to fund EAG review of every SOP that will be employed in implementing the Hydrogeologic Workplan activities.

Recommendation 12-00-12: A presentation on SOP implementation within the Workplan during the Annual Meeting in March 2001 would be useful.

The EAG requests a presentation during the March 2001 Annual Meeting demonstrating SOP implementation within the Workplan with discussion of new and modified SOPs.

Proposed Action 12-00-12:

A presentation on the QA program will be made on Tuesday, March 20 at the Annual Meeting.

Recommendation 12-00-13: If data quality problems are occurring with Americium analyses, as they did for 90Sr analyses, these should either be quickly addressed or turned over to an external laboratory.

The EAG notes the successful resolution of the 90Sr analysis issue with the use of an external analytical laboratory. There is concern regarding the lack of comment regarding the quality of Americium measurements. If there are data quality concerns with Americium, similar to those with 90Sr, they should be quickly addressed.

Proposed Action 12-00-13:

This recommendation refers to analyses done for the Environmental Surveillance Program rather than for the ER Project. The latter group is responsible for analysis of samples from Hydrogeologic Workplan wells. The Environmental Surveillance Program moved its analyses for surface water, runoff, groundwater, and sediment samples to analytical laboratories outside of the Laboratory during calendar year 2000.

MANAGEMENT AND GLOBAL ISSUES – Administrative

Recommendation 12-00-14: The EAG would like to caucus for no more than ½ hour before the first meeting and at the end of each day and would like the schedule to be more closely followed.

In an effort to clarify assignments and areas of special concern, the EAG would like to meet for ½ hour before the general meeting and ½ hour at the end of each day to plan for the next day. The arrangement is particularly important for stakeholder and management meetings. It is also recommended that the meeting schedule be adhered to more closely. The meeting chairperson should manage the time constraints.

Proposed Action 12-00-14:

The Project Manager will endeavor to respect the schedule so that the EAG can have time to meet at the end of the general meeting. There are no constraints on the EAG meeting in the morning before the general meeting begins.

Recommendation 12-00-15: The EAG would like to receive comments on recommendations about a week before the next meeting.

To better prepare for meetings, the EAG would like to receive responses to previous recommendations at least one week prior to the meeting.

Proposed Action 12-00-15:

The GIT regrets that this action plan will not be completed a week before the annual meeting. However, we will try to distribute the action plans at least a week prior to EAG reviews.

TECHNICAL ISSUES – Data Gathering

Recommendation 12-00-16: The EAG remains concerned that the ER documentation requirements might be too general to fully address the specific data gathering needs of the relatively complex Workplan.

While the EAG is pleased that the ER QA requirements are being adopted for the Workplan, it is felt that these requirements are not project-specific and provide only a skeletal framework (roles and responsibilities, training, processes used, purchasing, lessons learned). Because of the complexity, long time frame, and cost involved in the Workplan, it is important that the results of the Workplan produce reliable and defensible data for input to the database, modeling, and risk assessment efforts. The processes of well prioritization, location, drilling, coring, well logging, well completion, and sampling need to be carefully examined against the DQOs.

Stating the perceived failure in a set of R wells to produce high quality data and that impact on modeling calibrations and risk management methodologies, the EAG reiterates the possibility

that following the ER QA requirements might minimize data gathering problems and fully qualify the requisite information needed for the Workplan.

Proposed Action 12-00-16:

The GIT concurs with the need to reiterate on the DQOs in the Hydrogeologic Workplan, particularly with a site-wide emphasis, rather than well by well. This effort is planned to follow the March 2001 Annual Meeting. The team to conduct the reiteration will include the NMED. The results will be documented. Based on this effort, individual DQOs will be derived and put in the FIPs.

Recommendation 12-00-17: We recommend that the EAG be familiarized with specifics of the ER Project QA Program requirements relative to Workplan data gathering activities. This can be done via documentation to be provided to us, a detailed presentation at the March 2001, Annual Meeting, or a combination of the two. This would allow the EAG to provide better advisory services.

The EAG would like to become more familiar with the ER QA requirements and how they are being applied to the Workplan data gathering activities. It is recommended that this be accomplished by either providing documentation to the EAG for their review or a detailed presentation of the processes at the March 2001 Annual Meeting. This will help the EAG in evaluating and advising as to whether they feel the ER QA requirements is sufficient.

Proposed Action 12-00-17:

A presentation on the QA program will be provided at the annual meeting on March 20. The EAG may request more information at a breakout session with the ER Project QA staff on Thursday, March 22.

Recommendation 12-00-18: The EAG further recommends that ER QA personnel review our concerns and suggested approach from the data gathering section of the June 26, 2000 EAG report and make a determination as to the sufficiency of current ER QA documentation requirements in the context of those concerns.

It might be beneficial for the GIT to ask ER QA personnel to review the EAG's June 26, 2000 recommendations and approach against the ER QA documentation requirements. ER QA personnel could then determine whether their current QA requirements are sufficient to concerns of the Workplan.

Proposed Action 12-00-18:

The March 20 annual meeting presentation on the QA program will address EAG recommendations. The EAG may request more information at a breakout session with the ER Project QA staff on Thursday, March 22.

Recommendation 12-00-19: The hydraulic testing approach and expectations for O-1/R-5 need to be articulated and reviewed by the EAG to verify that this significant expenditure of funds will yield valuable information.

Because well R-5 is being drilled to ascertain hydraulic information, and not chemical information, the EAG feels it is essential that the GIT articulate testing plans and outline expectations for the well. Because of the expenditure to obtain hydraulic information only, it is important to maximize the utility of the data obtained.

Proposed Action 12-00-19:

The concerns expressed by the EAG are moot because R-5 is no longer being drilled close enough to O-1 to be used as a hydrologic testing well.

Recommendation 12-00-20: Spinner tests should be conducted on as many municipal wells as possible.

The EAG recommends use of spinner tests on municipal wells. When using a constant rate-pumping test on a multiple completion well, such as O-1, it is not possible to determine how much yield is contributed by each of the screened zones. The results of observation well data using a constant rate-pumping test may be problematic. A spinner log test can be conducted to determine the relative yield contribution of the screened aquifers.

Modelers have suggested that spinner log data from other municipal wells would be valuable to determine how transmissivity is distributed with depth.

Proposed Action 12-00-20:

The GIT Hydrology Subcommittee agrees with the recommendation, but has not identified the resources necessary to accomplish this task. The Hydrology and Modeling subcommittees request further discussion of this item at the breakout session on Thursday, March 22.

Recommendation 12-00-21: The use of properly designed recovery tests, as opposed to constant-rate pumping tests, should be explored as a more pragmatic way of obtaining municipal well hydraulic data.

It was noted at the October 2000 meeting that a deterrent to testing municipal wells was the inability of water levels to recover to static conditions. This problem can be alleviated by conducting a recover test, which would require maintaining an uninterrupted pumping rates for an extended period of time prior to the recovery test.

Proposed Action 12-00-21:

The GIT Hydrology Subcommittee agrees with the recommendation, but has not identified the resources necessary to accomplish this task. The Hydrology and Modeling subcommittees request further discussion of this item at the breakout session on Thursday, March 22.

Recommendation 12-00-22: Limiting factors should be reviewed to see if actions can be taken to obtain hydraulic data from municipal wells sooner, rather than later, to support model development.

The EAG is concerned that testing municipal wells when "available" (one or two wells per year) may not provide timely or adequate information for the modeling program. A critical review of municipal well testing restrictions is recommended to determine whether steps can be taken to conduct more aggressive well testing.

Proposed Action 12-00-22:

The GIT Hydrology Subcommittee agrees with the recommendation, but has not identified the resources necessary to accomplish this task. The Hydrology and Modeling subcommittees request further discussion of this item at the breakout session on Thursday, March 22.

TECHNICAL ISSUES - Database

Recommendation 12-00-23: *The EAG still considers the GIS/map interface for the WQDB to be extremely important to the usability and overall quality of the database and encourage the GIT to locate resources allowing its implementation.*

The EAG recommends a GIS/map interface for the Water Quality Database Project (WQDB). This capability would enhance usability by stakeholders and clarify information content.

Proposed Action 12-00-23:

The GIT Information Management Subcommittee agrees with the recommendation, but has not identified the technical and funding resources necessary to accomplish this task. Further discussion of this item is requested at the annual meeting.

Recommendation 12-00-24: *The EAG has a need for increased understanding about certain aspects of the WQDB and would appreciate additional information on these topics.*

The EAG has requested additional information to clarify certain aspect of the database. Specifically, information regarding data steward QA/QC tools and how these tools will be used; lookup table standardization and maintenance; clarification of the statement "chemistry results screened against given standards"; and how modeling results stored in the database be presented to an end user.

Proposed Action 12-00-24:

Two presentations on information management are scheduled at the annual meeting: the Information Subcommittee Status Report on March 20 and an information management poster on March 21.

Recommendation 12-00-25: *The EAG encourages enabling the WQDB to output results to a tab or comma delimited text file following a database query.*

To allow the end user to further manipulate WQDB data, it is recommended that queries have the capability of downloading in formats compatible with spreadsheets and/or standard statistical computer programs, such as tabbed or comma-delimited text.

Proposed Action 12-00-25:

The WQDB does download to delimited files that can be used in spreadsheets.

Recommendation 12-00-26: *The EAG requests to be informed of the URL for the WQDB as soon as it is available online.*

As soon as the WQDB is available online, the EAG would like to be notified of the web address. As a user, the EAG will provide feedback to the GIT.

Proposed Action 12-00-26:

The URL is <http://wqdbworld.lanl.gov>.

TECHNICAL ISSUES - Modeling

Recommendation 12-00-27: Develop a modeling education and communication program as part of Workplan activities and work with NMED to develop a mutual understanding of the role that modeling and analysis results are to play in risk and remedial response decision making for the LANL site.

An education and communication program for the Workplan modeling activities is recommended. Regulators and stakeholders need to be educated in the modeling program to enhance their confidence and acceptance of analytical results, which form the basis for decisions. This effort will facilitate understanding and acceptance of the modeling efforts. It is recommended further that modeling education and communication be incorporated as part of the Workplan activities.

Proposed Action 12-00-27:

The GIT concurs with this recommendation and will be starting a new feature of the quarterly meetings. At each meeting, a separate session on modeling will be provided for NMED and stakeholders to focus on the modeling activities. The goal of these sessions is to familiarize interested parties in the modeling and allow the opportunity for input and feedback.

Recommendation 12-00-28: Modify draft Revised Section 3.0 of Workplan to include less technical detail, and more information on description, scheduling, and integration of planned modeling tasks.

The EAG considers the draft Revised Section 3.0 of the Workplan to be a significant improvement over the original Section 3.0. However, the draft Revised Section 3.0 lacks sufficient detail to support an understanding of the modeling program necessary for the EAG to provide constructive feedback. The Groundwater Process Model sections contain a high level of detail with no supporting background information explaining terminology or methods. However, there is only a general discussion on the intended uses of the model. It would be beneficial to have more information regarding the specifics of the modeling program plan and individual modeling tasks.

Proposed Action 12-00-28:

It is our understanding that the NMED will approve Section 3.0 as submitted, so no further modifications are anticipated. However, the communication suggested in this recommendation is expected to occur at the modeling sessions that are to be added features of each quarterly meeting.

Recommendation 12-00-29: Revise modeling-related DQOs to correspond to the revised modeling work plan.

The draft Revised Section 3.0 of the Workplan mentions the relationship between the DQOs and the modeling activities, but does not indicate DQO updates. As the modeling program matures, the modeling-related DQOs should be updated to reflect the changes in the program, recent technical findings, and use of modeling results in risk-based corrective action decision making.

Proposed Action 12-00-29:

The GIT concurs with the need to reiterate on the DQOs in the Hydrogeologic Workplan, particularly with a site-wide emphasis, rather than well by well. This effort is planned to follow the March 2001 Annual Meeting. The team to conduct the reiteration will include the NMED.

The results will be documented. Based on this effort, the DQOs for modeling are expected to be revised to reflect the progress that has been made in the characterization program.

Recommendation 12-00-30: Take steps to include in modeling reports information on any manipulations made to geologic layer data to form model hydrostratigraphic units to ensure reproducibility of results; and include date stamps on any graphic output generated during modeling analyses as a QA documentation measure.

The EAG recommends that modelers clearly describe in the reports manipulations of geologic layer information used to derive hydrostratigraphic units for the hydrologic process model. This effort will ensure reproducibility of results. The EAG also requests that printed graphic output be date stamped for purposes of QA documentation.

Proposed Action 12-00-30:

QA documentation, such as date stamping, will be added to graphic outputs.

Recommendation 12-00-31: Provide EAG with more information on the ongoing and planned modeling program to provide a context and basis for meaningful technical review and comment.

In addition to the draft Revised Section 3.0, the EAG needs additional information regarding ongoing and planned modeling tasks so that effective review and comment can be provided. Suggested additional information includes intended uses of models, relevant regulatory factors, modeling DQOs, modeling tasks and analyses, schedule and integration plan, stakeholder communication plan, and uncertainty characterization plan.

Proposed Action 12-00-31:

The March 22 breakout sessions planned for the annual meeting are in response to this recommendation. The EAG will have the opportunity to discuss the modeling with the staff involved in that effort. In addition, the new feature of the quarterly meetings (a separate session on modeling) is expected to provide a forum for communicating this information to the EAG.

Recommendation 12-00-32: Evaluate the impacts that modeling the effects of Cerro Grande fire have had, and will have, on the planned modeling program, and adjust schedule as necessary.

The Cerro Grande fire interrupted many Laboratory activities, including the modeling efforts. The EAG would like to see an evaluation of the impact of the fire on the redirection of resources and an adjusted schedule.

Proposed Action 12-00-32:

The GIT appreciates this recommendation, but believes it is beyond the scope of the EAG review.

Recommendation 12-00-33: Arrange a meeting between EAG and GIT and ER Project management (and staff as appropriate) to discuss scope and integration of modeling activities in the HC and ER programs (preferably prior to the March 2001 Annual Meeting).

The GIT conducted a breakout session on modeling at the October 2000 Semi Annual Meeting. The EAG suggests a more structured meeting with greater depth to discuss modeling efforts prior to the March 2001 Annual Meeting.

Proposed Action 12-00-33:

Members of the EAG met with ER Management on January 30, 2001, and a similar meeting has been set for March 22 with DP management.

Recommendation 12-00-34: Provide to the EAG, as committed to in the September 20, 2000 Action Plan, copies of reports documenting completed modeling studies when they have been cleared for release. Move forward with plans to form a Risk-Based Decision Support Subcommittee to ensure integration of hydrogeologic characterization (HC) activities, and HC and ER modeling efforts, to meet DQOs and provide necessary information for risk-based corrective action decisions.

The EAG supports the formation of a Risk Assessment Subcommittee.

Proposed Action 12-00-34:

EAG members will be requested to review reports on a case-by-case basis. The GIT reserves the discretion to forward documents as appropriate for EAG charter, scope, and funding. The risk assessment responsibilities have been combined with the Modeling Subcommittee.

TECHNICAL ISSUES – Geochemistry and Geochemical Modeling

Recommendation 12-00-35: Continue investigations of drilling additive effects on groundwater samples and progress with removal during development.

The GIT and the EAG remain concerned about the negative impact of drilling additives on the quality of groundwater samples. As modeling and risk assessment activities rely on the quality of these samples, it is imperative that investigations regarding well development and drilling additive effects continue.

Proposed Action 12-00-35:

The GIT intends to continue investigations to understand and quantify the impact of drilling additives on the quality of groundwater samples.

Recommendation 12-00-36: Continue measuring and tracking parameters related to additive contamination when quarterly samples are collected.

Because of the negative impact of drilling additives on groundwater samples, data users may not consider data reliable for several quarters. The EAG recommends the GIT continue to measure drilling additive contamination during quarterly sampling and trend the observed results.

Proposed Action 12-00-36:

The GIT intends to continue investigations to understand and quantify the impact of drilling additives, including measuring and tracking parameters related to drilling additives in quarterly samples.

Recommendation 12-00-37: Carefully consider the ER SOPs being modified/developed for the Workplan in the context of Workplan DQOs.

The EAG recommends the Geochemistry Subcommittee reviews the ER sampling SOPs, which are being modified, or created for the Workplan to determine if they are sufficient for attaining high quality representative groundwater samples.

Proposed Action 12-00-37:

The Geochemistry Subcommittee will be involved in developing and reviewing the ER SOPs.

Recommendation 12-00-38: Attempt to create a first draft of the summary report requested in the last EAG report (June 26, 2000) by the Annual Meeting, 2001, if possible.

Referencing Recommendation 7-00-26: Develop a concise summary geochemical report in lay terms. The EAG requests the Geochemistry Subcommittee to prepare a summary report that discusses, in lay terms, information regarding geochemical data collection, conceptual model development, and speciation programs application to geochemical modeling scenarios. Also include information such as project status, future directions, information needed and what it means, how information will be used, and how it ties to the Workplan products.

Proposed Action 12-00-38:

Completion of the summary geochemical report has been delayed, but it is in progress and completion is expected in FY01.

TECHNICAL ISSUES – Drilling and Well Completion**Recommendation 12-00-39: Use longer filter pack overlaps.**

The EAG continues to recommend the use of longer filter pack overlaps, suggesting a minimum practical interval of 5 to 10 feet below the screen and 10 to 15 feet above the screen. The EAG feels there might be a lack of consensus among the GIT on the design of filter pack length and that recommended guidelines have not been submitted to the State. It is important to resolve this issue in order to avoid problems that could result from using short filter packs.

Proposed Action 12-00-39:

The GIT agrees on the importance of developing a consensus on filter pack length with the NMED. The process of negotiating permit language addressing this is ongoing.

Recommendation 12-00-40: Use cement grout in the blank pipe sections between well screens.

The EAG strongly recommends incorporating a zone of cement grout along the midpoint of the blank pipe areas in R wells being completed and in future R wells. The chemistry of groundwater samples should show no effect due to the cement grout.

Proposed Action 12-00-40:

The well installation procedures have been modified to include placing cement grout at the midpoint of blank pipe areas in multicompletion wells.

Recommendation 12-00-41: While striving to maximize well diameters, continue to be cognizant of the corresponding costs so that design changes are economically justified.

In an effort to complete larger diameter wells to better perform certain types of development and hydraulic testing, the GIT should carefully consider the costs that will be incurred in changing well design versus the value of information gained.

Proposed Action 12-00-41:

The GIT is not considering increasing the well diameters at this time.

Recommendation 12-00-42: Continue to use casing and screen designs that optimize well performance and are trouble free to install.

To clarify noted misunderstandings regarding the properties of pipe base screens versus other screen design types and the rationale for selection of each, the EAG provided a summary of available well screen type with an explanation of the choice of pipe base screens.

Proposed Action 12-00-42:

The GIT intends to continue to use casing and screen designs that optimize well performance.

Recommendation 12-00-43: Develop (or articulate) criteria for selecting screen zones in the R-wells.

The EAG is not clear on the strategy of selecting screened zones in the R wells. Have design criteria been developed? Is there consistency of purpose in design from well to well? The EAG requests from the GIT a summary of the design criteria that guide the selection of screened intervals for the R wells. If the criteria have been developed, they need to be articulated to the EAG; or if criteria have not been formalized, they need to be developed, documented, and communicated to the EAG.

Proposed Action 12-00-43:

Regarding selection of zones to be screened, a committee (including experts in geology, hydrology, and geochemistry) currently decides the number and location of screen zones in R wells after drilling and logging are completed. The criteria can be generalized as follows:

1. Larger perched zones are screened (this may include direct detection of perched conditions while drilling or the interpreted presence of perched conditions via borehole geophysics).
2. The top of the regional aquifer is screened.
3. Deeper portions of the regional aquifer are screened at intervals of every 100 or 150 ft depending on anticipated presence of contaminants and need for vertical hydraulic gradient information.
4. Particular depths for screening is determined based on a combination of geologic strata encountered, presence of water during drilling, and use of information from logs on likely permeable intervals. Individuals involved in the well design represent a cross section of GIT technical disciplines including geochemistry, hydrology, geology, and drilling. Data considered during well design include borehole geophysics, borehole videos, driller's observations, interpretation of drill cuttings, water-levels collected during drilling, and available groundwater screening results.

Recommendation 12-00-44: Meet with a subset of the EAG following the next semi-annual meeting to review and explain drilling cost categories and other available data.

As a result of discussions regarding the high cost of drilling at the Laboratory as compared to drilling at other federal facilities, the EAG has received cost summaries for LANL wells and various Nevada wells from DOE for review. The EAG recommends meeting with DOE personnel to discuss drilling costs. This could be accomplished at the March 2001 Annual Meeting.

Proposed Action 12-00-44:

The breakout session with the Well Construction Subcommittee has been scheduled for March 22 to allow the EAG the opportunity to discuss well construction concerns.

Recommendation 12-00-45: Consider examining drilling costs at INEL for benchmarking purposes.

Because drilling conditions at Los Alamos are more difficult than conditions at Nevada, a better benchmark for drilling costs would be wells drilled at INEL in Idaho. Drilling conditions in Idaho are similar to those in Los Alamos.

Proposed Action 12-00-45:

The GIT recognizes the importance of benchmarking drilling costs as expressed by the EAG in this recommendation and those in previous reports (11-98-18, 7-99-2, and 7-99-26). It remains the intention of the Program Manager to conduct a benchmarking study that will include INEEL.

Recommendation 12-00-46: Do not suspend drilling operations.

The ER Groundwater Investigation Focus Area has recommended suspending drilling operations until identified quality concerns have been remedied. The EAG recommends not suspending drilling activities, which would result in financial and schedule-related losses. The EAG feels that problems in well construction have been addressed, and quality concerns can be addressed and procedures put in place concurrently with drilling.

Proposed Action 12-00-46:

The drilling operations were suspended due to quality concerns and to schedule drilling resources more efficiently.

TECHNICAL ISSUES – Groundwater Monitoring**Recommendation 12-00-47: The EAG would appreciate a presentation dedicated solely to current and planned groundwater sampling methodologies at the next meeting we attend.**

The EAG commends the GIT for promptly starting the routine sampling of the completed wells. The EAG would like a presentation on the well sampling methodology at the March 2001 Annual Meeting.

Proposed Action 12-00-47:

A presentation of the quarterly sampling methodology and analytical results will be provided on March 21.

Recommendation 12-00-48: The EAG cautions that investigators and stakeholders should make a significant effort to understand the relationships among the factors that influence sample quality and how these will impact their interpretations.

It is necessary for data users to be aware of the fact that necessary compromises occur throughout well installation and sampling. Data users should attempt to understand the relationship of drilling and sampling factors that might influence the sample quality and whether these factors will impact interpretation of results.

Proposed Action 12-00-48:

The GIT concurs with the need to understand the relationships that influence sampling and data quality. The Geochemistry Subcommittee looks forward to discussing these factors at the breakout session on March 22.

Recommendation 12-00-49: Over-interpretation, and over reliance on, sampling results from the early quarterly monitoring events should be avoided.

As a result of residual drilling fluid effects (discussed in Recommendation 12-00-35), caution should be exercised when evaluating data from early sampling following well completion.

Proposed Action 12-00-49:

The GIT recognizes the limitations of sampling results from early quarterly monitoring events. A working group from the Laboratory and NMED will be formed to discuss the quarterly sampling analytical requirements.

Recommendation 12-00-50: A logical and consistent approach is needed for determining where to screen the wells and the methods for calculating the depths of the screens, seals and sand packs. The EAG recommends that the GIT develop this approach and have a single individual, highly trained in geology and/or hydrology, make these onsite decisions for all the remaining R wells.

Screen and seal placement errors can result in ongoing and systematic problems in understanding sampling results, both spatially and chemically. The EAG recommends a consistent approach for determining screen locations and methods for calculating depth of screens, seals, and sand packs. It is further recommended that a geology or hydrology trained person make onsite decisions as wells are being completed.

Proposed Action 12-00-50:

Regarding selection of zones to be screened, a committee (including experts in geology, hydrology, and geochemistry) currently decides the number and location of screen zones in R wells after drilling and logging are completed. The criteria can be generalized as follows-

1. Larger perched zones are screened (this may include direct detection of perched conditions while drilling or the interpreted presence of perched conditions via borehole geophysics).
2. The top of the regional aquifer is screened.
3. Deeper portions of the regional aquifer are screened at intervals of every 100 or 150 ft depending on anticipated presence of contaminants and need for vertical hydraulic gradient information.
4. Particular depths for screening is determined based on a combination of geologic strata encountered, presence of water during drilling, and use of information from logs on likely permeable intervals. Individuals involved in the well design represent a cross section of GIT technical disciplines including geochemistry, hydrology, geology, and drilling. Data considered during well design include borehole geophysics, borehole videos, driller's observations, interpretation of drill cuttings, water-levels collected during drilling, and available groundwater screening results.

Recommendation 12-00-51: The EAG recommends that the GIT follow ASTM guidelines for well development, and encourages the last step of the process to be pumping of each of the screened intervals with a pump using packers to isolate the individual intervals.

Because well development is important in obtaining quality samples, the EAG recommends the following the ASTM guidelines for well development. The final step of well development should be pumping of screened intervals with a pump using packers to isolate individual intervals.

Proposed Action 12-00-51:

The GIT is familiar with ASTM development guidelines and believes that the current development procedures conform to them. However, we do not yet have a dual packer development system.

Recommendation 12-00-52: With regard to sampling the single completion wells, such as R-9, the EAG would like to request additional information before we can comment.

Sampling methods are also important to quality samples. Sampling the wells with Westbay systems at formation pressure should result in quality samples for analysis. The EAG requests additional information on sampling single completion wells to better comment.

Proposed Action 12-00-52:

The sampling procedures will be described at a presentation at the March 2001 Annual Meeting. If more information is required, the breakout session on March 22 is an appropriate forum for discussion.

Recommendation 12-00-53: The EAG cautions that field analytical parameters that are sensitive to the atmosphere (e.g., DO, Eh, possibly pH) might not be accurate unless analyzed within a flow-through cell. The EAG recommends that the GIT consider eliminating filtration of samples from the Westbay systems to reduce analytical costs and conserve collected samples.

The EAG has concern about sampling and analysis of atmosphere-sensitive field parameters (dissolved oxygen [DO], Eh [oxidation/reduction potential], and pH). Accurate analysis of these parameters requires flow-through cell with appropriate electrodes. The current Westbay system is not accurate for parameters that are sensitive to changes when exposed to the atmosphere. The EAG requests the GIT consider eliminating filtration of samples from the Westbay system to reduce analytical costs and conserve collected sample for additional analyses.

Proposed Action 12-00-53:

The GIT Geochemistry Subcommittee agrees that atmosphere-sensitive field parameters can only be accurately measured with the flow-through cells. Discussions with Westbay about modifying equipment to allow a flow-through cell are ongoing.

TECHNICAL ISSUES – Risk Based Assessment

Recommendation 12-00-54: Empower the Risk-Based Decision Subcommittee to develop a risk assessment plan for use in the Hydrogeologic Workplan. This plan should establish goals and define a plan to address issues such as those presented above.

The EAG views the Risk Assessment Subcommittee as the focal point for design and implementation of a risk-based plan for the Workplan. The principal goal of the plan should address risk associated with contaminants identified during the sampling program and to assist in guiding data collection and siting of wells.

Proposed Action 12-00-54:

A breakout session has been planned for March 22 for risk assessment. The GIT expects that the breakout session discussion will further the development of a plan.

Recommendation 12-00-55: Provide information to the EAG on risk assessment approaches that go beyond the ER program, to address the special issues that must be addressed, should contaminants be found during well drilling.

The EAG requests information regarding the subcommittee's approach to risk assessment in regards to the Workplan and the special issues related to the Workplan; specifically addressing contaminants identified during sampling.

Proposed Action 12-00-55:

A breakout session has been planned for March 22 for risk assessment. The GIT expects that the breakout session discussion will further the development of a plan.

Recommendation 12-00-56: Possibly, find time during EAG meetings for EAG staff to meet with the risk assessment staff to review risk assessment approaches and methods.

The EAG requests time with the risk assessment personnel to discuss planned approaches to risk assessment.

Proposed Action 12-00-56:

A breakout session has been planned for March 22 for risk assessment. The GIT expects that the breakout session discussion will further the development of a plan.

Recommendation 12-00-57: Use the Risk-Based Decision Subcommittee as a central focus for the development of a program to inform all the involved parties of potential risk that may be associated with the risk significance of finding contaminants in groundwater.

The urgency of needing to potentially address the significance of a contaminant found during well drilling is a special issue to the Hydrogeologic Workplan. To address this issue, toxicity, geochemistry, model development, and other special issues such as colloidal transport and attendant toxicity attenuation will need to be addressed expeditiously. The EAG also recognizes that the topic of "plume chasing" has been raised continuously. A well-coordinated program that has the support of the GIT and outside parties can greatly enhance the program's ability to handle these troubling issues. A well-conceived program can go a long way toward addressing the essential risk issues that will undoubtedly be triggered if contamination is found; such as the necessity to drill wells for plume chasing. A well-conceived approach that combines

toxicity information with geochemical modeling, groundwater modeling, and understanding of other special issues may make plume chasing unnecessary or, if necessary at all, could help target where any additional wells should be drilled.

Proposed Action 12-00-57:

The Hydrology and Risk Subcommittee will be a central focus for communication of hydrologic and risk information.

**TABLE 1.
EAG CURRENT RECOMMENDATIONS AND PROPOSED ACTIONS**

Number	Recommendation	Action	Estimate of Schedule and Funding Impacts from Recommendation
12-00-1	Continue prompt, open, and regular communications.	Program Manager and GIT intend to continue communication efforts established in the Hydrogeologic Characterization Program. The Program Manager will request that EAG solicit feedback from stakeholders on how to improve communications during the stakeholder session at the March 2001 Annual Meeting.	No impact on schedule or funding.
12-00-2	Sample R-25 quarterly and determine disposition in about one year.	GIT concurs with recommendation and has included it in the letter responding to NMED's letter regarding R-25.	No impact on schedule or funding.
12-00-3	Address the contracting schedule slippage.	In FY00, delays in drilling were largely related to budget impacts from the Cerro Grande fire. At the October 2000 Quarterly Meeting, the Program Manager reported that delays in contracting had impacted FY01 planning, but this in itself has not resulted in a delay of the drilling schedule. A drilling "time out" was instituted in FY01 to address deficiencies identified in the <i>Management Assessment Report for Groundwater Investigations Focus Area</i> and to optimize the drilling schedule with respect to the funding profile for FY01 and FY02.	The schedule slippage will be resolved in FY02 with moderate funding impact.
12-00-4	Include a working meeting for managers at the next meeting.	A working meeting for managers has been scheduled for Monday, March 19, associated with the annual meeting. The focus of the senior manager meeting is the revised groundwater protection strategy and issues for senior management attention.	No impact on schedule or funding.
12-00-5	Develop skills in matrix management.	GIT agrees that matrix management at LANL, DOE, and NMED affects implementation of the Hydrogeologic Characterization Program. This an issue for senior management attention to be discussed at the March 19 senior manager meeting.	No impact on schedule or funding.

**TABLE 1.
EAG CURRENT RECOMMENDATIONS AND PROPOSED ACTIONS**

Number	Recommendation	Action	Estimate of Schedule and Funding Impacts from Recommendation
12-00-6	Definitions of modeling uncertainty are desirable.	Uncertainties in modeling have been evaluated in FY01 for modeling activities and will continue to be evaluated in FY02. It is the goal of the Laboratory to develop probability distributions for model input parameters, confirmed by site-specific numbers, in order to address the effects of uncertainty in the modeling outputs.	No impact on schedule or funding.
12-00-7	Institution of the Risk Assessment Committee is necessary.	Risk assessment has been combined with the Hydrology Subcommittee.	No impact on schedule or funding.
12-00-8	Displacement of post fire sampling/analyses/activities is necessary.	The Project Manager conducted a meeting to coordinate sampling efforts in alluvial wells in response to the concerns expressed by the NMED at the October 2000 Quarterly Meeting. Ken Mullen has been named the Program Manager for surface water and will be the single point of contact for surface water. Charlie Nylander has been named the Groundwater Program Manager and will serve as the single point of contact for groundwater.	No impact on schedule or funding.
12-00-9	Long term stewardship of the Workplan activities is unclear.	The Los Alamos National Laboratory Groundwater Protection Strategy has been revised to reflect comprehensive groundwater protection so that the Laboratory can fulfill the responsibility of stewards of natural resources. This revised strategy will be discussed with a goal of attaining consensus among the senior managers at the March 19 senior manager meeting.	No impact on schedule. Low impact on funding.

**TABLE 1.
EAG CURRENT RECOMMENDATIONS AND PROPOSED ACTIONS**

Number	Recommendation	Action	Estimate of Schedule and Funding Impacts from Recommendation
12-00-10	EAG continues to promote the use of a QAPP-type process for the Workplan that requires personnel to critically examine their portions of the Workplan to assure that DQOs are achieved efficiently and within budget.	The GIT agrees with the need to have a quality program for the Hydrogeologic Workplan (HWP) Activities. The drilling portion of the program will continue to use the ER QAPP. The ER Project performed a QA audit of the ER groundwater focus area team (presented at the October 2000 Quarterly Meeting), and the focus area team is correcting deficiencies. The ER Project has initiated an activity to "projectize" the HWP to identify discrete projects, responsible parties, scope, schedules, and deliverables. The result of this effort will be a list of projects that must be brought under the QAPP umbrella. In the meantime, the GIT has taken steps to formalize communication of DQOs for individual wells.	No impact on schedule. Low impact on funding.
12-00-11	EAG involvement in peer-review of the new, or modified, SOPs prior to their full adoption by the GIT for use in the Workplan.	The EAG will be requested to peer review selected SOPs, particularly those pertaining to sampling. However, resources are not available to fund EAG review of every SOP to be employed in implementing the Hydrogeologic Workplan activities.	No impact on schedule or funding.
12-00-12	Conduct a presentation on SOP implementation within the Workplan during the March 2001 Annual Meeting.	A presentation on the QA program will be made on Tuesday, March 20 at the Annual Meeting.	No impact on schedule or funding.
12-00-13	If data quality problems are occurring with Americium analyses, as they did for ⁹⁰ Sr analyses, quickly address the issues or turn them over to an external laboratory.	This recommendation refers to analyses done for the Environmental Surveillance Program rather than for the ER Project. The latter group is responsible for analysis of samples from Hydrogeologic Workplan wells. The Environmental Surveillance Program moved its analyses for surface water, runoff, groundwater, and sediment samples to analytical laboratories outside of the Laboratory during calendar year 2000.	No impact on schedule. Low impact on funding.

**TABLE 1.
EAG CURRENT RECOMMENDATIONS AND PROPOSED ACTIONS**

Number	Recommendation	Action	Estimate of Schedule and Funding Impacts from Recommendation
12-00-14	Caucus for no more than ½ hour before the first meeting and at the end of each day and would like the schedule to be more closely followed.	The Project Manager will endeavor to respect the schedule so that the EAG can have time to meet at the end of the general meeting. There are no constraints on the EAG meeting in the morning before the general meeting begins.	No impact on schedule or funding.
12-00-15	Provide comments to the EAG on recommendations about a week before the next meeting.	The GIT regrets that this action plan will not be completed a week before the annual meeting. However, we will try to distribute the action plans at least a week prior to EAG reviews.	No impact on schedule or funding.
12-00-16	The EAG remains concerned that the ER documentation requirements might be too general to fully address the specific data gathering needs of the relatively complex Workplan.	The GIT concurs with the need to reiterate on the DQOs in the Hydrogeologic Workplan, particularly with a site-wide emphasis, rather than well by well. This effort is planned to follow the March 2001 Annual Meeting. The team to conduct the reiteration will include NMED. The results will be documented. Based on this effort, individual DQOs will be derived and put in the FIPs.	No impact on schedule or funding.
12-00-17	Familiarize EAG with specifics of the ER Project QA Program requirements relative to Workplan data gathering activities. This can be done via documentation to be provided to us, a detailed presentation at the March 2001 Annual Meeting, or a combination of the two.	A presentation on the QA program will be provided at the annual meeting on March 20. The EAG may request a longer breakout session with the ER Project QA staff on Thursday, March 22.	No impact on schedule or funding.
12-00-18	ER QA personnel review EAG concerns and suggested approach from the data gathering section of the June 26, 2000 EAG report and make a determination as to the sufficiency of current ER QA documentation requirements in the context of those concerns.	The March 20 Annual Meeting presentation on the QA program will address EAG recommendations. The EAG may request a longer breakout session with the ER Project QA staff on Thursday, March 22.	No impact on schedule or funding.

**TABLE 1.
EAG CURRENT RECOMMENDATIONS AND PROPOSED ACTIONS**

Number	Recommendation	Action	Estimate of Schedule and Funding Impacts from Recommendation
12-00-19	The hydraulic testing approach and expectations for O-1/R-5 need to be articulated and reviewed by the EAG to verify that this significant expenditure of funds will yield valuable information.	The concerns expressed by the EAG are moot because R-5 is no longer being drilled close enough to O-1 to be used as a hydrologic testing well.	No impact on schedule or funding.
12-00-20	Conduct spinner tests on as many municipal wells as possible.	The GIT Hydrology Subcommittee agrees with the recommendation but has not identified resources necessary to accomplish this task. The Hydrology and Modeling subcommittees request further discussion of this item at the breakout session on Thursday, March 22.	No impact on schedule or funding.
12-00-21	Explore the use of properly designed recovery tests, as opposed to constant-rate pumping tests, as a more pragmatic way of obtaining municipal well hydraulic data.	The GIT Hydrology Subcommittee agrees with the recommendation but has not identified resources necessary to accomplish this task. The Hydrology and Modeling subcommittees request further discussion of this item at the breakout session on Thursday, March 22.	No impact on schedule or funding.
12-00-22	Review limiting factors to see if actions could be taken to obtain hydraulic data from municipal wells sooner, rather than later, to support model development.	The GIT Hydrology Subcommittee agrees with the recommendation, but has not identified resources necessary to accomplish this task. The Hydrology and Modeling subcommittees request further discussion of this item at the breakout session on Thursday, March 22.	No impact on schedule or funding.
12-00-23	Encourage the GIS/map interface for the WQDB to be extremely important to the usability and overall quality of the database and encourage the GIT to locate resources allowing its implementation.	The GIT Information Management Subcommittee agrees with the recommendation, but has not identified technical and funding resources necessary to accomplish this task. Further discussion of this item is requested at the March 2001 Annual Meeting.	No impact on schedule or funding.
12-00-24	Provide additional information to the EAG about certain aspects of the WQDB.	Two presentations on information management are scheduled at the March 2001 Annual Meeting: the Information Subcommittee Status Report and an information management poster.	No impact on schedule or funding.

**TABLE 1.
EAG CURRENT RECOMMENDATIONS AND PROPOSED ACTIONS**

Number	Recommendation	Action	Estimate of Schedule and Funding Impacts from Recommendation
12-00-25	Enabling the WQDB to output results to a tab or comma delimited text file following a database query.	The WQDB does download to delimited files that can be used in spreadsheets.	No impact on schedule or funding.
12-00-26	Inform the EAG of the URL for the WQDB as soon as it is available online.	http://wqdbworld.lanl.gov .	No impact on schedule or funding.
12-00-27	Develop a modeling education and communication program as part of Workplan activities and work with NMED to develop a mutual understanding of the role that modeling and analysis results are to play in risk and remedial response decision making for the LANL site.	The GIT concurs with this recommendation and will be starting a new feature at the quarterly meetings: a separate session on modeling will be provided for NMED and stakeholders to focus on the modeling activities. The goal of these sessions is to familiarize interested parties in the modeling and allow the opportunity for input and feedback.	No impact on schedule. Low impact on funding.
12-00-28	Modify draft Revised Section 3.0 of Workplan to include less technical detail, and more information on description, scheduling, and integration of planned modeling tasks.	It is our understanding that the NMED will approve Section 3.0 as submitted, so no further modifications are anticipated. However, the communication suggested in this recommendation is expected to occur at the modeling sessions that are to be added features of each quarterly meeting.	No impact on schedule. Low impact on funding.
12-00-29	Revise modeling-related DQOs to correspond to the revised modeling work plan.	The GIT concurs with the need to reiterate on the DQOs in the Hydrogeologic Workplan, particularly with a site-wide emphasis, rather than well by well. This effort is planned to follow the March 2001 Annual Meeting. The team to conduct the reiteration will include the NMED. The results will be documented. Based on this effort, the DQOs for modeling will be revised to reflect the progress that has been made in the characterization program.	No impact on schedule or funding.

**TABLE 1.
EAG CURRENT RECOMMENDATIONS AND PROPOSED ACTIONS**

Number	Recommendation	Action	Estimate of Schedule and Funding Impacts from Recommendation
12-00-30	Take steps to include in modeling reports information on any manipulations made to geologic layer data to form model hydrostatigraphic units to ensure reproducibility of results; and include date stamps on any graphic output generated during modeling analyses as a QA documentation measure.	QA documentation, such as date stamping, will be added to graphic outputs.	No impact on schedule or funding.
12-00-31	Provide EAG with more information on the ongoing and planned modeling program to provide a context and basis for meaningful technical review and comment.	The March 22 breakout sessions planned for the annual meeting are in response to this recommendation. The EAG will have the opportunity to discuss the modeling with the staff involved in that effort. In addition, the new feature of the quarterly meetings (a separate session on modeling) is expected to provide a forum for communicating this information to the EAG.	No impact on schedule. Los impact on funding.
12-00-32	Evaluate the impacts that modeling the effects of Cerro Grande fire have had, and will have, on the planned modeling program, and adjust schedule as necessary.	The GIT appreciates this recommendation, but believes it is beyond the scope of the EAG review.	No impact on schedule or funding.
12-00-33	Arrange a meeting between EAG and GIT and ER Project management (and staff as appropriate) to discuss scope and integration of modeling activities in the HC and ER programs (preferably prior to the March 2001 Annual Meeting).	Members of the EAG met with ER Management on January 30, 2001, and a similar meeting has been set for March 22 with DP management.	No impact on schedule. Low impact on funding.

**TABLE 1.
EAG CURRENT RECOMMENDATIONS AND PROPOSED ACTIONS**

Number	Recommendation	Action	Estimate of Schedule and Funding Impacts from Recommendation
12-00-34	Provide to the EAG, as committed to in the September 2000 Action Plan, copies of reports documenting completed modeling studies when they have been cleared for release. Move forward with plans to form a Risk-Based Decision Support Subcommittee to ensure integration of hydrogeologic characterization (HC) activities, and HC and ER modeling efforts, to meet DQOs and provide necessary information for risk-based corrective action decisions.	EAG members will be requested to review reports on a case-by-case basis. The GIT reserves the discretion to forward documents as appropriate for EAG charter, scope, and funding. The risk assessment responsibilities have been combined with the Modeling Subcommittee.	No impact on schedule or funding.
12-00-35	Continue investigations of drilling additive effects on groundwater samples and progress with removal during development.	The GIT intends to continue investigations to understand and quantify the impact of drilling additives on the quality of groundwater samples.	No impact on schedule or funding.
12-00-36	Continue measuring and tracking parameters related to additive contamination when quarterly samples are collected.	The GIT intends to continue investigations to understand and quantify the impact of drilling additives, including measuring and tracking parameters related to drilling additives in quarterly samples.	No impact on schedule or funding.
12-00-37	Carefully consider the ER SOPs being modified/developed for the Workplan in the context of Workplan DQOs.	The Geochemistry Subcommittee will be involved in developing and reviewing the ER SOPs.	No impact on schedule or funding.
12-00-38	Attempt to create a first draft of the summary report requested in the last EAG report (June 26, 2000) by the March 2001 Annual Meeting. (7-00-26)	Completion of the summary geochemical report has been delayed, but it is in progress and completion is expected in FY01.	No impact on schedule. Los impact on funding.
12-00-39	Use longer filter pack overlaps.	The GIT agrees on the importance of developing a consensus on filter pack length with the NMED. The process of negotiating permit language addressing this is ongoing.	No impact on schedule or funding.

**TABLE 1.
EAG CURRENT RECOMMENDATIONS AND PROPOSED ACTIONS**

Number	Recommendation	Action	Estimate of Schedule and Funding Impacts from Recommendation
12-00-40	Use cement grout in the blank pipe sections between well screens.	The well installation procedures have been modified to include placing cement grout at the midpoint of blank pipe areas in multicompletion wells.	No impact on schedule or funding.
12-00-41	While striving to maximize well diameters, continue to be cognizant of the corresponding costs so that design changes are economically justified.	The GIT is not considering increasing the well diameters at this time.	No impact on schedule or funding.
12-00-42	Continue to use casing and screen designs that optimize well performance and are trouble free to install.	The GIT intends to continue to use casing and screen designs that optimize well performance.	No impact on schedule or funding.

**TABLE 1.
EAG CURRENT RECOMMENDATIONS AND PROPOSED ACTIONS**

Number	Recommendation	Action	Estimate of Schedule and Funding Impacts from Recommendation
12-00-43	Develop (or articulate) criteria for selecting screen zones in the R-wells.	<p>Regarding selection of zones to be screened, a committee (including experts in geology, hydrology, and geochemistry) currently decides the number and location of screen zones in R wells after drilling and logging are completed. The criteria can be generalized as follows:</p> <ol style="list-style-type: none"> 1. Larger perched zones are screened (this may include direct detection of perched conditions while drilling or the interpreted presence of perched conditions via borehole geophysics). 2. The top of the regional aquifer is screened. 3. Deeper portions of the regional aquifer are screened at intervals of every 100 or 150 ft depending on anticipated presence of contaminants and need for vertical hydraulic gradient information. 4. Particular depths for screening is determined based on a combination of geologic strata encountered, presence of water during drilling, and use of information from logs on likely permeable intervals. Individuals involved in the well design represent a cross section of GIT technical disciplines including geochemistry, hydrology, geology, and drilling. Data considered during well design include borehole geophysics, borehole videos, driller's observations, interpretation of drill cuttings, water-levels collected during drilling, and available groundwater screening results. 	No impact on schedule or funding.
12-00-44	Meet with a subset of the EAG following the next semi-annual meeting to review and explain drilling cost categories and other available data.	The breakout session with the Well Construction Subcommittee has been scheduled for March 22 to allow the EAG the opportunity to discuss well construction concerns.	No impact on schedule. Low impact on funding.

**TABLE 1.
EAG CURRENT RECOMMENDATIONS AND PROPOSED ACTIONS**

Number	Recommendation	Action	Estimate of Schedule and Funding Impacts from Recommendation
12-00-45	Consider examining drilling costs at INEL for benchmarking purposes.	The GIT recognizes the importance of benchmarking drilling costs as expressed by the EAG in this recommendation and those in previous reports (11-98-18, 7-99-2, and 7-99-26). It remains the intention of the Program Manager to conduct a benchmarking study that will include INEEL.	No impact on schedule. Low impact on funding.
12-00-46	Do not suspend drilling operations.	The drilling operations were suspended due to quality concerns and to schedule drilling resources more efficiently.	No impact on schedule or funding.
12-00-47	Conduct a presentation to the EAG dedicated solely to current and planned groundwater sampling methodologies at the next meeting.	A presentation of the quarterly sampling methodology and analytical results will be provided on March 21.	No impact on schedule or funding.
12-00-48	Investigators and stakeholders should make a significant effort to understand the relationships among the factors that influence sample quality and how these will impact their interpretations.	The GIT concurs with the need to understand the relationships that influence sampling and data quality. The Geochemistry Subcommittee looks forward to discussing these factors at the breakout session on March 22.	No impact on schedule or funding.
12-00-49	Avoid over-interpretation, and over reliance on, sampling results from the early quarterly monitoring events.	The GIT recognizes the limitations of sampling results from early quarterly monitoring events. A working group from the Laboratory and NMED will be formed to discuss the quarterly sampling analytical requirements.	No impact on schedule or funding.
12-00-50	Develop logical and consistent approach for determining where to screen the wells and the methods for calculating the depths of the screens, seals, and sand packs. The EAG recommends that the GIT develop this approach and have a single individual, highly trained in geology and/or hydrology, make these onsite decisions for all the remaining R wells.	Refer to 12-00-43	No impact on schedule or funding.

**TABLE 1.
EAG CURRENT RECOMMENDATIONS AND PROPOSED ACTIONS**

Number	Recommendation	Action	Estimate of Schedule and Funding Impacts from Recommendation
12-00-51	Follow ASTM guidelines for well development, and encourage the last step of the process to be pumping of each of the screened intervals with a pump using packers to isolate the individual intervals.	The GIT is familiar with ASTM development guidelines and believes that the current development procedures conform to them. However, we do not yet have a dual packer development system.	No impact on schedule or funding.
12-00-52	Provide information regarding sampling the single completion wells, such as R-9.	The sampling procedures will be described at a presentation at the March 2001 Annual Meeting. If more information is required, the breakout session on March 22 is an appropriate forum for discussion.	No impact on schedule or funding.
12-00-53	The EAG cautions that field analytical parameters that are sensitive to the atmosphere (e.g., DO, Eh, possibly pH) might not be accurate unless analyzed within a flow-through cell. The EAG recommends that the GIT consider eliminating filtration of samples from the Westbay systems to reduce analytical costs and conserve collected samples.	The GIT Geochemistry Subcommittee agrees that atmosphere-sensitive field parameters can only be accurately measured with the flow-through cells. Discussions with Westbay about modifying equipment to allow a flow-through cell are ongoing.	No impact on schedule or funding.
12-00-54	Empower the Risk-Based Decision Subcommittee to develop a risk assessment plan for use in the Hydrogeologic Workplan.	A breakout session has been planned for March 22 for risk assessment. The GIT expects that the breakout session discussion will further the development of a plan.	No impact on schedule. Low impact on funding.
12-00-55	Provide information to the EAG on risk assessment approaches that go beyond the ER program, to address the special issues that must be addressed, should contaminants be found during well drilling.	A breakout session has been planned for March 22 for risk assessment. The GIT expects that the breakout session discussion will further the development of a plan.	No impact on schedule. Low impact on funding.
12-00-56	EAG staff to meet with the risk assessment staff at EAG meetings to review risk assessment approaches and methods.	A breakout session has been planned for March 22 for risk assessment. The GIT expects that the breakout session discussion will further the development of a plan.	No impact on schedule. Low impact on funding.

**TABLE 1.
EAG CURRENT RECOMMENDATIONS AND PROPOSED ACTIONS**

Number	Recommendation	Action	Estimate of Schedule and Funding Impacts from Recommendation
12-00-57	Use the Risk-Based Decision Subcommittee as a central focus for the development of a program to inform all the involved parties of potential risk that may be associated with the risk significance of finding contaminants in groundwater.	The Hydrology and Risk Subcommittee will be a central focus for communication of hydrologic and risk information.	No impact on schedule or funding.

APPENDIX A: COMPREHENSIVE LIST OF RECOMMENDATIONS AND STATUS OF PROPOSED ACTIONS

The EAG will produce two reports, e.g., "External Advisory Group Semi-Annual Report", for each fiscal year of implementation of the Hydrogeologic Characterization Program. Each report will contain the EAG's comments and recommendations. The Laboratory will address the comments and recommendations in an action plan for each of the EAG's reports.

Thus far, three EAG reports have been published: November 1998, July 1999, and December 1999. Table A-1 provides a matrix matching EAG reports with the Laboratory's action plan addressing each report.

Table A-1: EAG Reports and Corresponding LANL GIT Action Plans

EAG Report	Date	LANL GIT Action Plan	Date
"Semi-Annual Report to the Groundwater Integration Team of the Los Alamos National Laboratory by the External Evaluation Group"	11-98	"Los Alamos National Laboratory Groundwater Integration Team Action Plan for External Evaluation Group November 1998 Recommendations"	2-99
"Semi-Annual Report to the Groundwater Integration Team of the Los Alamos National Laboratory by the External Advisory Group"	7-99	"Los Alamos National Laboratory Groundwater Integration Team Action Plan for External Evaluation Group July 1999 Recommendations"	11-99
"Semi-Annual Report to the Groundwater Integration Team of the Los Alamos National Laboratory by the External Evaluation Group"	12-99	"Los Alamos National Laboratory Groundwater Integration Team Action Plan for External Evaluation Group October 1999 Recommendations"	02-00
"Semi-Annual Report to the Groundwater Integration Team of the Los Alamos National Laboratory by the External Evaluation Group"	6-00	"Los Alamos National Laboratory Groundwater Integration Team Action Plan for External Evaluation Group March 2000 Recommendations"	9-00
"Semi-Annual Report to the Groundwater Integration Team of the Los Alamos National Laboratory by the External Evaluation Group"	12-00	This document	3-01

Table A-2 provides a mechanism for tracking past recommendations and the status of implementation of proposed actions. Each action has been given a "tracking" number, which includes the EAG report publication month and year. Notation is provided where recommendations are substantially the same in both the November 1998 and July 1999 EAG report.

Table A-2: Comprehensive List of Recommendations and Status of Proposed Actions

Tracking Number	Action Status	EAG Recommendation	LANL GIT Action	Notes
7-00-1	In process	Continue ongoing communications to refine Workplan end product(s) with representatives from LANL, DOE, and NMED with EAG participation not mandatory.	The GIT will continue to schedule manager meetings with the EAG during the EAG semi-annual reviews. The GIT encourages the EAG to reiterate the importance of the management consensus at these sessions.	
7-00-2	Complete	A presentation at the next EAG meeting to clarify details of the Hydrogeologic Workplan as it relates to the Environmental Restoration (ER) QA framework.	A presentation on the adoption of the ER Quality Assurance framework by the hydrogeologic characterization program has been scheduled for the October 2000 Quarterly/EAG Semi-Annual meeting.	
7-00-3	In process	Continue assessment of DQO needs of the Workplan and applicability to ER QA and SOP processes.	The ER Project Groundwater Investigation Focus Area has committed to reviewing existing SOPs by October 2000 and updating and/or preparing necessary SOPs by January 2001.	
7-00-4	In process	Expeditious evaluation of ER SOPs relevant to ongoing and future Workplan processes.	The ER Project Groundwater Investigation Focus Area has committed to reviewing existing SOPs by October 2000 and updating and/or preparing necessary SOPs by January 2001.	
7-00-5	Complete	Analytical services to be provided by a vendor external to LANL until LANL laboratory services can prove quality data generation.	LANL environmental surveillance program is now using outside analytical laboratories.	
7-00-6	Complete	Facilitate note taking with immediate laptop storage.	Meeting minutes will be limited to summaries of conclusions, significant discussions, and action items. It is hoped that limiting the scope of the minutes will facilitate turn around time and distribution.	

Table A-2: Comprehensive List of Recommendations and Status of Proposed Actions

Tracking Number	Action Status	EAG Recommendation	LANL GIT Action	Notes
7-00-7	Complete	Addition of a management closeout session to the regularly scheduled GIT management meeting.	A debriefing for managers by the EAG has been scheduled for the October 2000 Quarterly/Semi-Annual EAG meeting.	
7-00-8	In process	Formalize the GIT Subcommittees' decision process resulting in Workplan wells Field Implementation Plans (FIP) to include increased documentation of rationale and approach.	The hydrogeologic characterization program will adopt the documentation requirements of the ER Project QA program.	
7-00-9	In process	External review of aquifer test data analysis and interpretation for the modeling program.	Separate reports on hydrologic testing are being prepared. EAG will be asked to provide comments on the draft reports.	
7-00-10	In process	Consider enhanced aquifer screening in some wells for modeling purposes and consider thorough testing and analysis of existing municipal production wells.	Municipal supply wells were tested when constructed. Further work on the production wells is a matter of opportunity as they are used for water supply. Some of the new R wells will be located near municipal supply wells in order to provide further information on hydrologic properties. It will be hard to achieve a static water level near some of the wells for hydrologic testing.	
7-00-11	In process	Continue the Water Quality Database (WQDB) per schedule or exceed scheduled development.	The WQDB has made significant progress toward making all data accessible. Accelerated the process of making runoff data available on the web. The schedule for the WQDB will be presented at the October Quarterly/EAG Semi-Annual meeting.	
7-00-12	In process	The Well Construction module of the WQDB should contain all drilling aspects of the wells.	Ability to capture drilling techniques, fluids in the hole, drilling depths, and much more are included in the database design. D. Broxton and B. Stone participated in the design process in order to ensure completeness. Each module is extensively reviewed prior to finalization to ensure items are not left out.	

Table A-2: Comprehensive List of Recommendations and Status of Proposed Actions

Tracking Number	Action Status	EAG Recommendation	LANL GIT Action	Notes
7-00-13	In process	Include external data to the WQDB only if the data conforms to specific collection SOPs and methodologies, and either flag or do not include older data that do not conform.	Data from external sources to be incorporated in the database through the use of identifiers related to the data's source and to the SOPs/collection methods that were used. Ultimately, it is the decision of data stewards whether to incorporate external data into the WQDB at all; but these identifiers should make the decision to do so less risky.	
7-00-14	In process	Include the GIS/map interface in the WQDB.	Actively working to identify and obtain additional resources necessary to support the development of GIS/map interface in WQDB.	
7-00-15	In process	Utilize WQDB beta testers external to the Laboratory.	Difficulties arranging for system beta testing because of the LANL firewall. Modules of the system are becoming available for access to the public in late September 2000, which will allow ease of beta testing by NMED, the Pueblos, CAB, and EAG. In addition, the WQDB team is willing to organize periodic on-site testing sessions for representatives of these organizations.	
7-00-16	Complete	Provide EAG with information regarding planned modeling activities to include activity schedules and descriptions.	A revision to the Hydrogeologic Workplan has been drafted that provides a schedule for the planned modeling activities and describes how modeling is used in decision-making. To be presented at the October meeting.	
7-00-17	Complete	Afford EAG additional time with modeling staff to discuss technical modeling issues.	To provide more detail, written reports will be distributed to some or all members of the EAG when the documents are approved for distribution. Additionally, an evening session to discuss modeling has been added to the agenda for the October Quarterly/EAG Semi-Annual Meeting.	

Table A-2: Comprehensive List of Recommendations and Status of Proposed Actions

Tracking Number	Action Status	EAG Recommendation	LANL GIT Action	Notes
7-00-18	Complete	Provide the EAG with a copy of the draft Hydrologic Workplan.	The modeling workplan is a revision to Section 4 of Hydrogeologic Workplan and will be presented at the October Quarterly/EAG Semi-Annual meeting.	
7-00-19	Complete	Continue to enhance the hydrologic modeling in respect to geologic and geochemical modeling, well installations and site characterization, deep well monitoring, and risk assessment.	A "hands-on" session to demonstrate and clarify the links between the modeling and the databases will be conducted at the October Quarterly/EAG Semi-Annual meeting. Demonstrated will be the integration of R-Well data collection, spatial data analysis, geologic modeling and hydrologic and geochemical modeling. The GIT Risk-Based Decisions Subcommittee will handle the definition and description of the relationship of DQOs for data and models in the context of a risk endpoint.	
7-00-20	In process	Continue to build on the DQO process for hydrologic modeling that was established in the Hydrologic Workplan.	The GIT Risk-Based Decisions Subcommittee will address much of this recommendation. The ER Project has initiated a dialog with NMED regarding confidence intervals and the use of probabilistic contaminant fate and transport models to support risk-based corrective-action decisions.	
7-00-21	In process	Provide EAG with additional technical information regarding modeling methodologies and results.	The ER Project sees great value in peer review by the EAG and will pursue funding avenues to support the EAG in this activity.	
7-00-22	In process	Provide GoldSim/FEHM comparison modeling information to EAG.	The ER Project will be pleased to provide EAG with FEHM/GoldSim comparisons to date. In FY 2001, the ER Project will be developing GoldSim applications for particular corrective-action remedies for the MDAs.	

Table A-2: Comprehensive List of Recommendations and Status of Proposed Actions

Tracking Number	Action Status	EAG Recommendation	LANL GIT Action	Notes
7-00-23	Complete	Reconsider the feasibility of planned studies to simulate TA-50 water injection test with discrete fracture and dual permeability models.	Additional calculations have not been included in Work Packages with EES-5 for Fiscal Year 2001. Any new modeling concerning the TA-50 tracer test will be limited in scope and designed to bolster the conclusions already obtained.	
7-00-24	Complete	Continue with planned testing and monitoring activities at TA-49.	The ER Project will continue to report to the GIT (and the EAG, if requested) on the effectiveness of the VCM at reducing in situ moisture at that site, to the extent that such information provides insight into the hydrology of specific (disturbed) portions of the Pajarito Plateau.	
7-00-25	In process	Continue to refine regional aquifer model for receptor and risk analysis performance capabilities.	The GIT and the ER Project will evaluate the applicability of commercial probabilistic groundwater pathway analysis tools (e.g., GoldSim and GroundwaterFX) to aide in the development of a useful risk-based decision-support tool for the regional aquifer.	
7-00-26	In process	Develop a concise summary geochemical report in lay terms.	The GIT Risk-Based Decisions Subcommittee will consider this recommendation. The subcommittee chairperson assesses this recommendation as the need for DQOs for geochemical analysis and modeling activities.	
7-00-27	Complete	Require longer pipe lengths for well drilling and completion and require an 8.75 percent open area in the base pipe.	The recommendation will be incorporated as purchase orders for pipes are issued.	
7-00-28	In process	Obtain NMED approval for installation of longer filter pack intervals in R wells.	The October Quarterly/EAG Semi-Annual meeting will include a presentation and discussion of the status of the RCRA/HSWA permit and well construction issues, including screen length, filter pack, and well annulus.	

Table A-2: Comprehensive List of Recommendations and Status of Proposed Actions

Tracking Number	Action Status	EAG Recommendation	LANL GIT Action	Notes
7-00-29	Complete	Present current and planned groundwater sampling methodologies at the next EAG.	The October Quarterly/Semi-Annual GIT meeting will include a presentation on the progress thus far in developing SOPs. At the March 2001 Annual Meeting, there will be a complete presentation of completed SOPs.	
7-00-30	In process	Research current methods, including the NMED low-flow sampling protocol, of groundwater sampling and develop sampling SOPs for Westbay systems and single-screen installation R wells.	Current methods of groundwater sampling are being incorporated into SOPs currently under development.	
7-00-31	In process	The effects of newly utilized synthetic drilling fluids on sample quality following well completion are largely unknown. Therefore, the EAG would caution the GIT, NMED, and other stakeholders that gradual changes in monitored parameters, including potential contaminants, might be observed in the R wells for some number of sampling events after well completion.	Chemistry studies have been done to quantify potential effects of interference of drilling fluids. Documenting the affect of the various types of drilling fluid effects is one step toward interpreting the sampling results that will be obtained from the quarterly sampling.	
7-00-32	In process	Use air rotary casing advance drilling methods, without fluids other than water, for Los Alamos and Mortandad Canyon wells.	The possibility of drilling without drilling fluids will be evaluated for each well, weighing the benefits of water chemistry against the cost and schedule risks of "dry" drilling.	
7-00-33	In process	Review the significance of colloidal transport of contaminants in sample collection and modeling.	The subcommittee will continue to review information regarding colloidal transport of contaminants and to closely evaluate water quality data to assess the occurrence of colloidal transport within the hydrogeologic system of the Pajarito Plateau.	

Table A-2: Comprehensive List of Recommendations and Status of Proposed Actions

Tracking Number	Action Status	EAG Recommendation	LANL GIT Action	Notes
7-00-34	In process	Develop risk assessments plan specific to the Hydrological Workplan and identify risk assessment staff.	The GIT Risk-Based Decisions Subcommittee will identify risk-based decision analysis methods applicable to the objectives of the Hydrogeologic Workplan, communicate the utility of these methods to develop DQOs for tasks and activities pursuant to the objectives of the Hydrogeologic Workplan, and assist the GIT in implementing these methods consistently and appropriately.	
7-00-35	In process	Provide risk assessment approaches to be employed if contaminants noted during well drilling for EAG review, and provide time during EAG meetings for EAG and risk assessment staff discussion.	The GIT Risk-Based Decision Subcommittee will provide the GIT and EAG with periodic updates of progress made by the subcommittee, which will focus on discussions, decisions and possible roadblocks and/or resistance regarding the application of risk-based decision analysis methods to GIT activities and tasks.	
7-00-36	In process	Develop a risk-based response plan to be implemented if data in exceedance of established standards is released to the public and stakeholders.	The Risk-Based Decision Subcommittee will review and revise, as necessary, the draft response-to-contamination decisions framework proposed by the GIT to the NMED. The decision framework will identify decision criteria such as exceedances of MCLs at accessible locations. Once the draft decision framework is determined to be complete by the subcommittee, it will be provided to the EAG for review and comment.	
7-00-37	In process	Develop list of MCLs, or other guideline, for potential chemicals of concern.	The risk assessor of the Risk-Based Decisions Subcommittee will ensure that such a list is available, either as a stand-alone document or as a list of readily accessible references.	

Table A-2: Comprehensive List of Recommendations and Status of Proposed Actions

Tracking Number	Action Status	EAG Recommendation	LANL GIT Action	Notes
7-00-38	In process	Risk assessment process for subpopulation groups is to be flexible and iterative.	The Risk-Based Decisions Subcommittee will be aware of current and emergent discussions regarding risk assessment scenarios through member involvement in the ER Project's integrated risk assessment team. Non-standard receptors and/or exposure scenarios that are determined to be reasonable and appropriate for contamination identified in groundwater will be included in risk assessments for the groundwater pathway, when such risk assessments are deemed necessary to support a decision. Those situations will be identified in the decision framework discussed in Response Action 4.	
12-99-1	Complete	Formation of a Senior Management Team to help define end product(s) with representatives from LANL, DOE, and NMED.	The Program Manager commits to identifying a manager willing to organize and chair this group. The assistance of EAG member Dr. Robert Charles may be requested to facilitate the initiation of the group.	The EAG/Managers meeting in March found general concurrence on the end state of the hydrogeologic characterization program. Continued semi-annual meetings with the managers will confirm the expected products.
12-99-2	Complete	Continued examination of add-on requests and divesting the GIT of items not specifically enumerated by the Workplan.	The Response to Contamination process is expected to keep a focus on the Hydrogeologic Workplan objectives. The definition of the end state by the management team will also help in maintaining a focus on the long-term objectives.	

Table A-2: Comprehensive List of Recommendations and Status of Proposed Actions

Tracking Number	Action Status	EAG Recommendation	LANL GIT Action	Notes
12-99-3	In Process	Establishment of a policy for data distribution.	Data will be available on the Water Quality Database via the internet. The distribution of preliminary (unvalidated) data does require a process that has Laboratory management and legal counsel approval. The Program Manager will request the assistance of Laboratory Legal in developing a preliminary data distribution policy.	Data collected from runoff after the Cerro Grande fire has focused responsibility for development of a policy for data release on the Watershed Integration Team.
12-99-4	Complete	Re-enumeration of the criteria for well prioritization.	The GIT and NMED/HRMB have had initial discussions on the prioritization scheme and have agreed to reach a consensus prioritization at the Annual Meeting scheduled for March 2000.	
12-99-5	Pending	The EAG will meet with the CAB at a mutually agreeable time and place.	The GIT encourages the EAG to participate in a CAB meeting. If the timing of CAB meetings is not coincident with EAG meetings, then the Chair of the EAG should attend a CAB meeting.	
12-99-6	Pending	Development of a risk-based conceptual approach.	The Response to Contamination process incorporates a qualitative assessment of risk. The ER Project has developed a risk assessment approach that will be used in defining the scope of the response. A presentation of the risk assessment approach will be provided at the Annual Meeting in March.	The GIT has formed a subcommittee for risk decisions to provide more focus on risk assessment.

Table A-2: Comprehensive List of Recommendations and Status of Proposed Actions

Tracking Number	Action Status	EAG Recommendation	LANL GIT Action	Notes
12-99-7	In process	The Selection of an individual on the GIT to lead development of subordinate DQO's, manage QAPP for the Workplan, and elucidate its relationship to the existing documents in the Environmental Restoration (ER) and Environmental Safety and Health (ESH) as well as the Workplan final products.	The adoption of Hydrogeologic Workplan activities into the ER Project QA system will begin with a Quality Assurance self-assessment. The assessment will provide the information necessary to bring a coherent and consistent QA system to the Hydrogeologic Workplan activities.	
12-99-8	In process	Development and regular updating of the web site for routine communication of data, issues, etc.	The ESH-18 web site will be expanded to include the GIT activities. The map and contents of the web site is under development now. The schedule and contents of the web site will be discussed at the Annual Meeting in March.	A draft web page has been developed and is in review.
12-99-9	In process	Data gathering activities should be guided by the development of the DQO processes for these activities and supports the efforts in this direction.	The GIT continues to promote the use of DQOs (or equivalent approaches) to planning data collection within the GIT Subcommittees.	The GIT has formed a subcommittee for risk decisions to provide more focus on risk assessment
12-99-10	In process	The SOPs developed under the DQOs or DQO-like process be subjected to some form of external review prior to finalization.	As indicated in the response to recommendation 12-99-7, the GIT has recognized the need to formalize the QA implementation for Hydrogeologic Workplan activities. The ER Project administrative procedures require peer review for all documents.	

Table A-2: Comprehensive List of Recommendations and Status of Proposed Actions

Tracking Number	Action Status	EAG Recommendation	LANL GIT Action	Notes
12-99-11	In process	The request of information needed to better understand the relationships of DQOs and SOPs to the QAPPs developed in ER and ESH to better evaluate the potential need for development of a QAPP for the Workplan.	The SOPs that are being used and those will that be developed for use on the drilling program undergo peer review as prescribed by the ER Project administrative procedures. A presentation on the ER Project QA program will be included in the Annual Meeting in March.	
12-99-12	Complete	Technical sessions be held for the purpose of examining data gathering at later semi-annual meetings.	The suggestions for technical sessions will be incorporated into the Annual Meeting agenda to the extent possible given time constraints.	
12-99-13	Complete	The plan for a comprehensive Water Quality Database and input from users in both the preliminary and latter stages of a database module's development should be continued.	The Water Quality Database (WQDB) development team has adopted the EAG recommendation to implement the system's water level module prior to the chemistry module. The WQDB development team completes a software design process prior to any programming. This process helps ensure that the system will meet the needs of users, thereby reducing the potential for system rewrites due to inadequate implementation. The modular design process includes a cooperative effort between development team members, GIT subject matter experts, and additional representatives of the end-user community.	
12-99-14	In process	Continue with efforts to better understand the spatial distribution of infiltration, porosity, and hydraulic conductivity.	The modeling approach that will be taken is to use statistically based distributions as input for hydrologic parameters that are based on (and constrained by) the data collected from the R-wells. This statistical approach to developing input parameters in the hydrologic models will be discussed at the Annual Meeting in March.	

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Tracking Number	Action Status	EAG Recommendation	LANL GIT Action	Notes
12-99-15	In process	The EAG promotes the geochemical modeling as it relates to fate and transport of contaminants or where it can yield better understanding of ground water flow directions and rates.	Geochemical modeling continues to be an interpretative task for the GIT Geochemistry Subcommittee.	
12-99-16	Complete	The EAG recommends better evaluation of the advantages and disadvantages of using parameters developed from surface complexation modeling versus the incorporation of simple linear isotherm Kd values in the models and the use of non site specific Kd.	The GIT concurs with the need to include surface complexation modeling in the "toolbox" for interpreting data collected for the hydrogeologic characterization program. The Geochemistry Subcommittee has begun modeling simulations to determine Kds from surface complexation.	
12-99-17	Complete	Properly designed profile wire screens in the monitoring wells should be used.	Wire screens are currently planned for all of the wells. If alternative types of well screens are considered in the future, the EAG will be asked to provide technical review.	
12-99-18	In process	All processes involved in creating and sampling the monitoring wells should be considered within the context of capturing the information needed to accomplish the monitoring objectives.	The GIT Geochemistry Subcommittee has been assigned the task of evaluating the considerations brought forward by the EAG and providing recommendations to the GIT regarding those considerations. A presentation on groundwater sampling at the Annual Meeting in March will address these recommendations.	The GIT has formed a subcommittee for risk decisions to provide more focus on risk assessment

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Tracking Number	Action Status	EAG Recommendation	LANL GIT Action	Notes
12-99-19	Complete	Unencumbered casing advance drilling should be used as a substitute for mud rotary drilling if extensive data needs are not needed.	At present, casing advance is the only well drilling method planned. However, the GIT will continue to evaluate alternative drilling methods suggested by stakeholders. The EAG will be essential to evaluation of alternative drilling methods.	
12-99-20	Pending	For long screen wells that are already installed, characterize flow rates across the screened interval with depth and/or characterize the well for contaminants along the screen length to determine where to place the pump.	The GIT Geochemistry Subcommittee is evaluating the concerns regarding well drilling, well design, and sampling methods and will report on their recommendations at the Annual Meeting in March.	
12-99-21	Pending	Different construction techniques should be considered for long-screen completions that are not yet installed.	The GIT Geochemistry Subcommittee is evaluating the concerns regarding well drilling, well design, and sampling methods and will report on their recommendations at the Annual Meeting in March.	
12-99-22	Pending	The monitoring wells at LANL should not be screened above the water table.	The Technical Enforcement Guidance Document has been used for technical construction specifications for screen placement. However, the GIT Geochemistry Subcommittee is evaluating the concerns regarding well drilling, well design, and sampling methods and will report on their recommendations at the Annual Meeting in March.	

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Tracking Number	Action Status	EAG Recommendation	LANL GIT Action	Notes
12-99-23	Pending	Different construction techniques (i.e., not single long screen) should be considered for wells that will be subjected to screen aeration as the water table drops during the well's lifetime.	The GIT Geochemistry Subcommittee is evaluating the concerns regarding well drilling, well design, and sampling methods and will report on their recommendations at the Annual Meeting in March.	
12-99-24	Pending	Low-flow sampling should be used for routine monitoring in all the monitoring wells at LANL due to the potentially detrimental impacts of high-flow sampling on sample quality.	The GIT Geochemistry Subcommittee is evaluating the concerns regarding well drilling, well design, and sampling methods and will report on their recommendations at the Annual Meeting in March.	
12-99-25	In progress	The proper collection of core sequences should be continued for the deep monitoring wells installed in areas having high expected contaminant probability. Consideration must be given to reducing the amount of coring in locations where contaminants are considered to be unlikely, thus speeding well installation.	The amount of coring planned for each borehole is determined based on a number of factors including hydrologic uncertainties, stratigraphic uncertainties, and expectations regarding contaminants. The GIT feels that the uncertainties in the hydrologic and geologic setting should be weighed equally with presence of contaminants.	Coring needs are determined on a well-by-well basis.
7-99-1	Complete	Develop an understanding of the relationships of upper management among the stakeholders.	The upper management of LANL, DOE, and NMED will be invited to the quarterly meetings, annual meeting, and the next EAG meeting.	Combined with Recommendation 11-98-4. The GIT chairperson has provided briefings as requested and will continue to be available on an on-call basis for briefing upper management.

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Tracking Number	Action Status	EAG Recommendation	LANL GIT Action	Notes
7-99-2	Pending	Pursue some aspects of benchmarking.	Potential contractors have been contacted to determine their capabilities in this area and initial ideas for a scope of work have been discussed.	Combined with Recommendation 11-98-18 . The benchmarking study is important to the GIT and some progress has been made toward implementing this study. Due to budget constraints, the study can not be started until October 1999.
7-99-3	Complete	Continue meetings between external stakeholders and the EAG.	The GIT intends to continue this forum of expression and feedback at EAG meetings.	The feedback from the stakeholders has been positive.
7-99-4	Pending	Continue extensive communication efforts, including the expansion of Internet utilization.	In addition to formal and informal meetings with the stakeholders, the GIT plans to make information accessible via the Internet.	Combined with Recommendation 11-98-1 . The Water Quality Database will be accessible through the Internet. A GIT web page with links to searchable GIT minutes, the Hydrogeologic Workplan, field implementation plans, well completion reports, daily drilling reports, and other documents have been under consideration.
7-99-5	Complete	Continue preparation and implementation of action plans responding to the EAG's recommendations.	An action plan will be prepared in response to each EAG report.	The recommendations have been numbered to facilitate tracking. Each successive action plan will provide a status of cumulative set of recommendations to ensure that each is fully addressed.
7-99-6	Complete	Continue providing meeting locations that enhance focus.	The meeting locations will be off-LANL whenever possible to enhance focus.	Positive feedback was received on the choice of Ghost Ranch for the location for the annual meeting. Similar settings will be considered for future meetings.

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Tracking Number	Action Status	EAG Recommendation	LANL GIT Action	Notes
7-99-7	Complete	Prepare hard copies of presenter's more technical transparencies.	The overheads will be compiled into a meeting booklet to facilitate the EAG program reviews.	
7-99-8	Complete	Add some technical sessions.	There will be increased time allotted to technical presentations. Concurrent sessions may be appropriate if the participants at meetings have clearly defined and distinct interests that can be addressed in separate sessions.	The GIT would like to try this approach on a pilot basis. There is a concern that some stakeholders may feel left out of discussions that are held concurrently.
7-99-9	Pending	Add EAG members for geoscience and economics expertise and, possibly temporary members in other areas.	The GIT requests that the EAG identify potential new members and invite their commitment to serve on the EAG.	The GIT concurs in the need to expand the fields of expertise within the EAG.
7-99-10	Pending	Develop a risk-based conceptual plan in three categories: Chemicals of Concern, Source, Transport and Fate, and Exposure to Receptors.	A plan to address contamination found while implementing Hydrogeologic Workplan activities will be presented to NMED and EAG during the October meeting.	Development of this plan requires coordination of different groups and programs within LANL so that it can be incorporated into the re-issued RCRA permit.
7-99-11	Pending	Have EAG review LANL's risk assessment team results and future plans.	The EAG will be asked to review the planned response to detecting contamination at the October meeting	
7-99-12	Pending	Develop a risk-based approach for interpreting the significance of finding on-site well contamination; as the site-specific, alternate contaminant level (ACL) approach has proven most useful for complex sites such as LANL.	Initial inputs to this plan were discussed at the Annual Meeting and work on it is continuing. The development of this plan requires coordination of different groups and programs within LANL so that it can be incorporated into re-issued RCRA permit.	Combined with Recommendation 11-98-7. The ACL criteria have been incorporated into the response for detecting contamination.
7-99-13	Pending	Compare such plans to those used by other regulatory agencies (e.g. EPA) and other states.	The GIT will obtain the available resources and use them in the development of the response plan.	The GIT understands that this program is not an unfamiliar task.

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Tracking Number	Action Status	EAG Recommendation	LANL GIT Action	Notes
7-99-14	Pending	Establish acceptance of site specific ACLs.	The ACL criteria have been incorporated into the response to detecting contamination as a first step to establishing the response to contamination.	Combined with Recommendation 11-98-2 . The GIT agrees that the process for establishing ACLs should be part of the response plan. However, the GIT feels that it is inappropriate to propose actual numbers for ACLs until more is known about the hydrogeologic characteristics of the specific locations for which they might be proposed.
7-99-15	Complete	Reconsider the Hydrogeologic Workplan DQO scenarios when updating the hydrogeologic conceptual models.	The conceptual models will be refined based on new data collected in this program. The DQO scenarios, which are based on the conceptual models, will likewise be refined as appropriate.	The GIT is in agreement with this recommendation. Each GIT subcommittee has been asked to begin the DQO process with the data collected thus far.
7-99-16	Pending	Develop DQOs for processes subordinate, but essential to, the hydrogeologic characterization such as well completion, sample collection, data validation, database development, and model development.	The GIT subcommittees have been encouraged to use the DQO process (or a DQO-like process) in the areas mentioned in the recommendation and in all of their planning activities.	
7-99-17	Pending	Data gathering efforts should utilize DQO processes and a special session discussing these efforts should be held.	The GIT subcommittees have been encouraged to use the DQO process (or a DQO-like process) to develop comprehensive Standard Operating Procedures for data collection. At the next EAG meeting, the GIT will provide a report on the status of this activity.	

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Tracking Number	Action Status	EAG Recommendation	LANL GIT Action	Notes
7-99-18	Complete	Database issues should be clarified, and funding issues for database development should be given a high priority	The Information Management Subcommittee has brought on a project management specialist to develop a resource-loaded schedule in order to develop a request for funding adequate to support the information management system development and maintenance.	Combined with Recommendation 11-98-14. The GIT recognized information management as the keystone of this program. Development of the system is lagging in the information collection in the program. This is primarily due to funding priorities and constraints.
7-99-19	Complete	The geologic model should be used for preliminary predictions of stratigraphic boundaries.	The predictions on the stratigraphic contacts will continue to be used in the Field Implementation Plan. As more data are added to the geologic model, these predictions will become more certain.	Predicted stratigraphic contacts are included in the Field Implementation Plan. The predictions come from the stratigraphic model. In areas of LANL where there are more nearby wells, the predictions are closer to reality than in areas of LANL where less is known. The basalts are a "wild card" because the geologic controls on the distribution are not well known.
7-99-20	Complete	An overall geochemical model should be developed.	A budget will be requested for this task. Each subcommittee member is engaged in the process so that the FY00 budget request will include adequate funding.	One goal of the GIT Geochemistry Subcommittee is to develop an overall geochemical model.
7-99-21	Pending	Present more geochemical calculations and carry out sorption isotherm experiments.	These are interpretive tasks that will have a funding request for FY00. Sorption studies are planned for areas where contamination is encountered so that remedial options can be developed.	

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Tracking Number	Action Status	EAG Recommendation	LANL GIT Action	Notes
7-99-22	Complete	Additional hydrogeologic modeling results should be presented.	The modeling presentations for the next EAG meeting will focus on the technical details of the modeling accomplished thus far.	Combined with Recommendation 11-98-23. The budget constraints for the modeling effort are a result of the difficulties at well R-25. The response to the constraints is to focus on documenting what has been done rather than further development. This focus will have the additional benefit of having materials prepared for the next EAG meeting.
7-99-23	Complete	The segmented approach to site modeling should be continued.	The segmented approach to site modeling will be continued.	Approaching the modeling at three different scales seems to be effectively providing modeling results to many users at the same time.
7-99-24	Pending	Review of hydrologic modeling reports is requested by the EAG.	The EAG will be requested to review the hydrologic modeling reports.	
7-99-25	Pending	The locations and rates of recharge should continue to be defined.	The results of the plateau-scale modeling will be presented at the October meeting.	In addition to the preliminary recharge discussion presented at the Annual Meeting, the plateau-scale modeling has indicated that recharge is a sensitive parameter in the model.
7-99-26	Pending	Improvement of drilling cost analyses, as part of benchmarking should continue.	Some potential contractors have been contacted to determine their capabilities in this area, and initial ideas for scope of work have been discussed.	The benchmarking study is important to the GIT.
7-99-27	Pending	Review of the design of stainless steel screens installed in the deep monitoring wells is requested by the EAG.	The EAG will be requested to review the well design for each well.	The specifications for well construction are included in the Field Implementation Plan for each well.

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Tracking Number	Action Status	EAG Recommendation	LANL GIT Action	Notes
7-99-28	Pending	Evaluate drilling method after five or six wells have been drilled using the current method.	The procurement for continued drilling services will take place this fall. More discussions will occur before the drilling method(s) will be specified.	The new drilling procurement will allow the flexibility to try different drilling methods if the drilling costs remain high after five or six holes.
11-98-3	Complete	Have NMED representatives present during some portion of the next EAG meeting.	Arrangements will be made with NMED to attend appropriate portions of the meeting.	Inviting stakeholders to EAG meetings will continue.
11-98-6	Complete	The proper sequence of priorities should be consistent in Tables 4.1 and 4.2.	<p>Tables 4-1 and 4-2 in the Hydrogeologic Workplan (May 22, 1998) will be revised as the program evolves and new data is collected.</p> <p>The priority sequence will be adjusted during quarterly meetings and will be reflected in the Annual Report.</p> <p>Information in Tables 4-1 and 4-2 will be updated on an annual basis and included in the Annual Report.</p>	The tables will be updated in every annual report.
11-98-9	Complete	Core should be logged and evaluated as soon as possible after retrieval. Core that will be used for parameter testing or sorptive potential should be stored in an intact state and tested as soon as possible.	<p>The procedures for handling core include logging the retrieved core as soon as possible after extraction.</p> <p>Immediately after logging, sections of the core that are of possible hydrologic, geologic, or geochemical interest are preserved.</p> <p>After the core from the entire borehole has been collected, portions of core are selected for testing.</p>	Adherence to the Standard Operating Procedures for handling core and other samples will continue to preserve the integrity of the samples.

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Tracking Number	Action Status	EAG Recommendation	LANL GIT Action	Notes
11-98-11	Complete	Review data needs on a continual basis and review the scope of the characterization program on an annual basis in light of what the regulators require.	The Hydrogeologic Workplan was developed on the premise that data needs would be reviewed with each addition of new data and the scope of the program adjusted based on that review. The regulators are regularly involved in this review via the Annual Meeting, Quarterly Meetings, and informal meetings as required.	Continual re-evaluation of the data needs will continue in conjunction with stakeholder and EAG input.
11-98-13	Complete	WESTBAY systems should be demonstrated and well understood before it is used.	LANL personnel have taken a number of steps to investigate WESTBAY system including visiting sites with WESTBAY systems installed for demonstration of sampling, and studying literature from sites that are using WESTBAY systems. The next demonstration of the WESTBAY system will be as installed in the R-25 well. Completion decisions for each well will be made after the drilling and initial sampling have been completed and will be based on the conditions encountered in each well. WESTBAY systems will only be installed in wells for which it is suitable.	The use of WESTBAY systems will be evaluated on a well-by-well basis and will incorporate stakeholder and EAG input.
11-98-17	Complete	Place filter packs greater than 2 feet (10 to 20 feet) above the top of the screens to account for settling of the filter material in wells that may be used for monitoring.	Filter pack will be placed 2 feet above the perforations; additionally 3 feet of fine sand will be placed above the filter pack.	Adherence to the Standard Operating Procedures for well construction will continue to preserve the integrity of the well.
11-98-22	Complete	Consider periodic rebid of drilling work on a combination of per-foot basis for drilling and coring and per-hour basis for other activities.	Rebid of the drilling contract will consider definition of per-foot charges for certain activities and per-hour charges for other activities.	The initial meetings to develop the drilling procurement documents have focused on how to structure the compensation framework.

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Tracking Number	Action Status	EAG Recommendation	LANL GIT Action	Notes
11-98-1	see 7-99-4	Continue the frequent, detailed and exhaustive communication efforts to keep relationships on the upswing with the regulators and the community as well as the funding organizations.	Maintain communication with stakeholders at the level that it has been for the past 2 years. Formal meetings will occur five times a year – four quarterly meetings and one annual meeting. Informal meetings and communication (e-mail, phone calls) will also continue as new information warrants. Make data accessible through the Internet.	Web interface will be operational in approximately one year. This recommendation is combined with 7-99-4 for further action.
11-98-2	see 7-99-14	Reach agreement with NMED on MCL's (and ACL's).	Initial discussions about MCLs and ACLs occurred at January 1999 Quarterly Meeting. Proposed approach in Annual Report. The proposed approach was discussed the Annual Meeting in March.	Requires coordination and consensus within the Laboratory (ESH-18, ER Project) to develop groundwater cleanup levels that can be proposed to NMED. This recommendation has been combined with recommendation 7-99-14 for action.
11-98-7	see 7-99-12	Develop contingency for examination of intermediate zones, particularly working with stakeholders to evaluate tradeoff between deep wells and shallower wells.	A proposed approach will be discussed with NMED at the Annual Meeting. The approach, when finalized, will be formalized by inclusion in the RCRA permit when it is reauthorized.	Requires coordination and consensus within the Laboratory (ESH-18, ER Project) to develop an approach that can be proposed to NMED. This recommendation has been combined with recommendation 7-99-12 for action.
11-98-14	see 11-99-18	FIMAD should more rapidly incorporate legacy data and the system be available for timely use by stakeholders	Environmental surveillance data and data collected under this program to be available through the Internet. Groundwater data will be linked to Environmental Restoration data, but the exact relationship of the Water Quality Database to FIMAD has not been determined.	The Groundwater Database is in development. This recommendation has been combined with 11-99-18 for action.

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Tracking Number	Action Status	EAG Recommendation	LANL GIT Action	Notes
11-98-15	Complete	The three-person drilling crew should have backups in case of fatigue, illness, or other reasons.	Evaluate the possibility of training another three-person crew.	The staffing provided by the driller under their contract is under close scrutiny. The procurement for continued drilling services to be released this fall might specify staffing levels.
11-98-20	Complete	Revise budget and update budget projections on a continual basis to reflect the iterative nature to the program.	There is quarterly reporting on the budget, an annual post mortem, and a projection for the next fiscal year. Budget revisions will be discussed at the annual project review.	This recommendation will be fully implemented at the annual project review scheduled for October 1999.
11-98-21	Complete	Have an annual project review to identify mid-course corrections and ensure cost-effective management and execution. The review should include performance reviews, costs to date, next year's tasks, and proposed budget.	An annual project review will be initiated for FY99. The review will include technical and management performance review, previous year costs, and next year tasks, and proposed budget. Participants will include LANL organizations (ESH-18, ER, EES, NWT) and DOE.	An annual project review is scheduled for October 1999.
11-98-23	see 7-99-20	Use modeling as a tool to evaluate the need for and location of future wells and as a communication tool with stakeholders.	Planned modeling activities for FY99 should produce a working model that can be used for this purpose. The model will also be used to communicate the program with stakeholders.	This recommendation has been combined with 7-99-20 for action.
11-98-4	see 7-99-1	Have a better description of the relationship and support within LANL for the activity, including how the management of ESH, ER, NWT, etc. regards the activity with respect to their other priorities.	A description of how the Hydrogeologic Workplan activities fit within the LANL structure will be prepared for the next meeting of the EAG.	This recommendation is combined with 7-99-1 for action.

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Tracking Number	Action Status	EAG Recommendation	LANL GIT Action	Notes
11-98-5	Complete	Have a more detailed stakeholders identification map defining relationships other than the three to five major stakeholders.	A stakeholder identification map will be prepared for the next meeting of the EAG.	The complete implementation of this recommendation is now scheduled for the October 1999 meeting of the EAG.
11-98-8	see 12-99-24	Use low-flow purging and sampling techniques for water-yielding wells and passive sampling for poorly-yielding wells.	The options and technical basis for each option should be an agenda item for the next meeting of the EEG.	This issue will have increased importance when a well is completed and quarterly sampling begins. Consensus with stakeholders on the use of these sampling techniques must be reached before sampling begins. This recommendation has been combined with 12-99-24 for action.
11-98-10	Complete	Consider using cement seals if the bentonite grout seals fail under certain circumstances.	Should the situation arise that bentonite seals are not effective, then other sealing options (including cement seals) will be considered, evaluated, and tested in order to continue the drilling.	In the event that other seals are necessary, the EAG will be asked to provide input on the sealing options. NMED will have to concur with any decision to change the well completion specifications.
11-98-12	see 12-99-19	Avoid mud-rotary drilling in order to preserve the pristine nature of subsequent samples.	There are no plans to use mud rotary-type drilling for the regional wells. Mud rotary-type drilling may be used in other circumstances, such as installation of wells targeted for the intermediate zone(s) where the exact depth and configuration is known prior to the start of drilling.	When mud rotary and other drilling methods are under consideration, the EAG will be asked to provide input on the options. Input from NMED will be requested with any decision to change the well drilling methods. This recommendation has been combined with 12-99-19 for action.

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Tracking Number	Action Status	EAG Recommendation	LANL GIT Action	Notes
11-98-16	Complete	Complete the wells with metal fittings rather than PVC.	<p>Currently all deep wells are planned for metal fittings.</p> <p>There may be conditions under which PVC fittings would be considered, but that decision would be made on a case-by-case basis considering the factors in the situation and weighing the pros and cons of PVC.</p> <p>This decision would not be made without seeking input from the stakeholders and technical experts.</p>	In the event that other fittings are evaluated for use, the EAG will be asked to provide input on the options. NMED will have to concur with any decision to change the well completion specifications.
11-98-18	Pending	Benchmark the costs-to-date against similar activities.	A benchmarking study will be initiated in early 1999 with the goal of having preliminary results for the next EAG meeting.	The GIT concurs with this recommendation. This recommendation is combined with recommendation 7-99-2 for action.
11-98-19	Complete	Develop more detailed GANTT chart with scheduled deliverables that indicates how the results of the hydrologic investigations will be incorporated into the RFIs and CMSs.	<p>How hydrologic results will be incorporated into ER Project documents will be determined and described.</p> <p>A GANTT chart may not be the best presentation of this information.</p>	The complete implementation of this recommendation is now scheduled for the October 1999 meeting of the EAG.