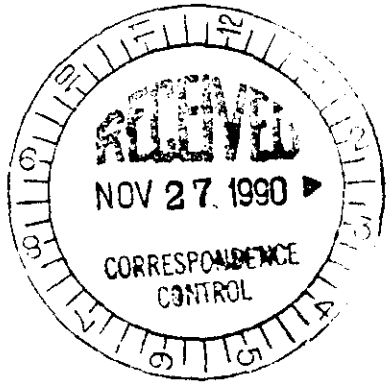
United States
Environmental Protection
Agency

Region 10
Hanford Project Office
712 Swift Boulevard, Suite 5
Richland WA 99352

9005031

EPA START

November 21, 1990



R. K. Stewart
Unit Manager
U.S. Department of Energy
P.O. Box 550, A6-95
Richland, Washington 99352

Re: 1100-EM-1 RI Work Plan Supplement

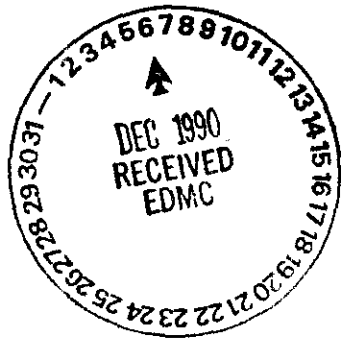
Dear Mr. Stewart:

The U. S. Environmental Protection Agency (EPA) is submitting technical comments on the above referenced document. Enclosed are the comments in both hard copy and diskette.

The comments should be fairly straightforward, but if there are any questions, please do not hesitate to call me on 376-3883.

Sincerely,

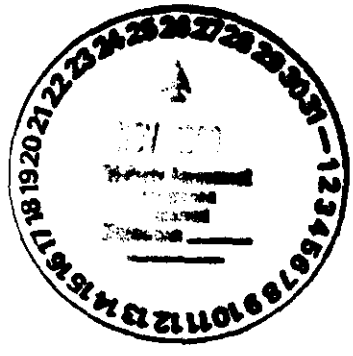
David R. Einan
Unit Manager



Enclosure

cc: L. Goldstein, Ecology
W. Staubitz, USGS
D. Lacombe, PRC
T. Veneziano, WHC
Administrative Record

(w/o enclosure)
P. Day
T. Nord
S. Wisness



TECHNICAL REVIEW COMMENTS
REMEDIAL INVESTIGATION PHASE 2 SUPPLEMENTAL WORK PLAN
1100-EM-1 OPERABLE UNIT
HANFORD SITE

ES-1 Executive Summary, p. i, second paragraph

The Phase I/II feasibility report was not delivered in September 1990. This report is scheduled to be submitted in December 1990.

2-1 Section 2.1, first paragraph

A reference is made to DOE-RL 1990-0X. This reference is not included in the references in Section 6.0. Please change the reference in the text or include the correct reference in the back.

2-2 **Deficiency/Recommendation:** Section 2.1, p. 2-4

The sixth paragraph discusses the nearest agriculture zones 1.1 mile to the west of the operable unit. However, there is land leased from Battelle that is used for agriculture between Stevens and George Washington Boulevards and also adjacent to the Tri-Cities University Center (TUC). This land is generally irrigated from the Columbia River, but could be irrigated from wells at some future time. This land should be included in the inventory of land use in this area.

2-3 **Deficiency:** Section 2.3, p. 2-8

The vadose-zone transport contaminant pathway is considered insignificant. As noted in comments to the Phase I RI report, it is premature to discount the vadose-zone pathway for two reasons: (1) the contaminant distribution in the vadose-zone at the Horn Rapids Landfill and at UN-1100-6 is unknown, and (2) the contaminant migration processes in the vadose-zone were not sufficiently evaluated in the Phase I RI report to definitively comment on potential contaminant migration in the vadose-zone in the 1100 Area.

Recommendation:

Include vadose-zone transport as a potentially relevant contaminant transport pathway at the Horn Rapids Landfill and at UN-1100-6 until the distribution of contaminants in the vadose-zone at these sites is fully evaluated.

3-1 **Deficiency:** Section 3.1.2, p. 3-2, fifth paragraph

The text states, "Due to uncertainties ... it is impossible to identify data quantity needs exactly." Since the sampling and analysis is addressed by means of a staged approach to the Phase 2 RI, it should be possible to identify the data quantity needs in each stage for all environmental media.

Recommendation:

The data quantity for soil and ground water should be identified and presented for stage 1 of Phase II RI. For subsequent stages, the data quantity can be estimated from the results of previous sampling activities identifying the data required in each stage.

3-2 **Deficiency:** Figure 3-6, p. 3-13/14 and Section 4.6.3.4, p. 4-35

The activity description states that if the TCE and nitrate are not attributed to the Horn Rapids Landfill, the hydrogeologic characterization will be ceased. This is in conflict with CERCLA § 107. The Department of Energy (DOE) "owns" contaminated groundwater and is liable for its investigation and remediation.

Recommendation:

Remove the phrase "no further hydrogeologic characterization will be conducted" and replace with "formal participation and/or cost recovery will be pursued with ANF".

4-1 Section 4.1.5.

A reference is made to the Data Management Plan (DMP) contained in the original 1100-EM-1 RI/FS. Is the DMP from this RI/FS still appropriate? Does it need updating? If so, maybe the reference should be to one of the later work plans, modified for the 1100-EM-1 Operable Unit. A number of changes have been made since the first 1100-EM-1 work plan was published.

4-2 **Deficiency/Recommendation:** Sections 4.2.2 and 4.2.2.1

It is stated that Hanford Site coordinates will be used. To be consistent, Lambert coordinates should be used especially since the GIS will be used for this operable unit. The Hanford coordinate system should be a secondary system, if used at all. Will the Army Corps of Enginees do the surveying or will it be done by Kaiser. This probably should be stated.

4-3 **Deficiency:** Section 4.2.1.1, p. 4-4

Additional activities are required other than obtaining existing Federal, State, and Local government documents on projected land and water use.

Recommendation:

1. Potential "extreme" uses of the Richland well field should be considered:

- What will be the effect if the well field is used to a much greater extent than at present (e.g., during a prolonged shutdown of the filtration plant)?

- What will be the effect if the well field is pumped with no recharge to the recharge basin (e.g., during periods of high demand coincident with a breakdown of the recharge pumps)?

2. Our best present information indicates that there are some private wells in the area that are identified (by well owners and/or well drillers) as being "domestic" wells. These wells are probably not used for drinking water, but are used for lawn watering, filling swimming pools, washing cars, etc. However, is there anything to prevent well owners from using these wells for drinking water (e.g., during periods when the Richland system is down, or because they like the taste better, or they can operate their wells cheaper than paying for Richland water)? Are these well owners aware that their wells may be contaminated (now or in the future)? Are there plans to provide information of potential impacts to the local well owners and to the City of Richland?

4-4 Section 4.2.1.2, p. 4-4

A revisit to Ecology files (to find any newly drilled/filed well reports) should be included. Also, review of the USGS well files should be conducted. Possibly other agencies may also have records; Health Departments, etc.

4-5 **Deficiency:** Section 4.3.1.1, p. 4-6

The text states archived soil samples from the 1100-1 and 1100-4 subunits will be analyzed for gross alpha-, beta-, and gamma-radiation. Table 1 in the quality assurance project plan (QAPP) (p. A-10) identifies SW-846 method 9310 as the analytical method. Method 9310 is for gross alpha and gross beta analyses of water samples, and does not include soils or a gamma scan. In addition, the water sampling holding time is six months for gross alpha and beta (EPA, 1986). More than six months has elapsed since Phase I RI soil sampling. Therefore, it is questionable whether archived soil samples should be analyzed using the referenced method.

Recommendation:

The appropriate methods that will be used to analyze soil samples for gross alpha, beta, and gamma should be identified. If appropriate, the use of the archived soil samples which exceeded sample holding times should be justified.

4-6 Section 4.4.1, p. 4-11

A pumping test may be required for the 1100-2 operable subunit (depending on results of the planned activities). This test would be

conducted in similar fashion to the planned test for the HRL. It would be appropriate to include mention of this possible test for 1100-2.

4-7 Section 4.4.1.1, p. 4-11 and Figure 4-4, p. 4-12

The proposed location for the new monitoring well is located about 250 feet from the area of greatest PCE (as found in soil investigation). With existing water level data, the location does appear to be directly downgradient from this area of high soil PCE. However, if the purpose of this well is to discover if any contamination of the groundwater system has taken place, it may be better to place this first well closer to the high soil PCE. At 250 feet away, inaccuracy in delineating the flow system and/or complications in how PCE moves through the groundwater system (acting as a DNAPL) could result in a plume being present but not moving through the proposed well location. By moving the well closer to the PCE soil site, we should have greater confidence in the results. The well should be moved closer to the high soil PCE area.

4-8 **Comment/Recommendation:** Figure 4-8 and Section 4.5.3.1

The proposed monitoring well is located too far from the UN-1100-6 subunit. Since this well will be used to determine whether further drilling is necessary, it should be drilled in an area most likely to detect contamination. From the figure, it would appear that this is too distant from the source, especially since the Richland well field may modify the gradient in this area when recharge is occuring.

4-9 **Deficiency:** Section 4.6, p. 4-22

A waste site vadose-zone soil sampling plan is necessary at the HRL. The most important shortcoming of the RI Phase I investigation was the failure to carry waste site vadose-zone soil sampling at the HRL as outlined in the 1100-EM-1 Phase I RI work plan. This leaves us with significant data gaps with respect to what contaminants, if any, are found within the vadose-zone of the HRL and whether these contaminants serve as a source of groundwater contamination. It should be noted that TCE concentrations in wells downgradient of the HRL are nearly twice those measured in the upgradient ANF wells. Without vadose-zone source data, it will be very difficult to determine if ANF or South Pit alone is the source of TCE, or if the HRL is also a significant TCE source.

Recommendation:

Include waste site vadose-zone soil sampling in the work plan.

4-10 **Deficiency:** Section 4.6.1.1, p. 4-23, first paragraph

This section describes the installation of a permanent soil gas monitoring network for the Horn Rapids Landfill. While the purpose of collecting this data is explained, how the data will be used is not explained.

Recommendation:

A description of how this data will be used and interpreted should be provided. A description of the levels of soil gas that will trigger further investigation and the possible approaches to further investigation should be included.

4-11 **Deficiency/Recommendation:** Section 4.6.1.1

A permanent soil gas monitoring network is to be established to monitor for the release of vapors from any rupture of suspected buried drums. Land use could play a part in whether this task would be conducted. If future residential land use is considered, it may be that a survey would need to be conducted to dtermine for certain the existence and extent of buried drums. These drums (if they exist) would have to be removed. If the soil gas monitoring is to be done, what happens if soil gas samples show a positive result? Will the drums (again, if they exist) need to be removed? Would it be better to characterize the site now or some time in the future? How long will monitoring occur? What are the costs for monitoring in perpetuity versus characterizing and removing (if necessary) now? This should be elaborated upon in this section or at least in this work plan.

4-12 Figure 4-11

Considering the scale of this map, do any contours run through this area? Should these contours be placed in this figure? If contours are available they should be included.

4-13 **Deficiency:** Section 4.6.1.2, p. 4-23

The text states archived soil samples from the Horn Rapids landfill will be analyzed for gross alpha-, beta-, and gamma-radiation. Table 1 in the QAPP (p. A-10) identifies SW-846 method 9310 as the analytical method. Method 9310 is for gross alpha and gross beta analyses of water samples, and does not include soils or a gamma scan. In addition, the water sampling holding time is six months for gross alpha and beta (EPA, 1986). More than six months have elapsed since Phase I RI soil sampling. Therefore, it is questionable whether archived soil samples should be analyzed using the referenced method.

Recommendation:

The appropriate methods that will be used to analyze soil samples for gross alpha, beta, and gamma should be identified. If appropriate, the use of the archived soil samples which exceeded sample holding times should be justified.

4-14 **Deficiency:** Section 4.6.2, p. 4-29, first paragraph

This section describes how the lateral and vertical extent of polychlorinated biphenyl (PCB) contamination will be delineated at the Horn Rapids Landfill. It has not been demonstrated that PCBs are the only contaminants of concern at the landfill.

Recommendation:

Before a final sampling plan is designed for the Horn Rapids Landfill, the overall objectives of the sampling should be agreed upon by DOE and EPA.

4-15 **Deficiency:** Section 4.6.2.2, p. 4-29, fourth paragraph

The text states that samples will be analyzed for total chromium and hexavalent chromium by the analytical procedures specified in Table 1 of the QAPP (p. A-10). Table 1 of the QAPP identifies the CLP analytical method for chromium. The CLP analytical method for chromium is for total chromium and not for hexavalent chromium (EPA, 1989a).

Recommendation:

The analytical method for hexavalent chromium (EPA, 1986) should be included in Table 1 of the QAPP.

4-16 **Deficiency:** Section 4.6.3, p. 4-32

There is no reason provided for not evaluating the sources of 1,1,1-trichloroethane and tetrachloroethylene at the Horn Rapids Landfill.

Recommendation:

Trichloroethane and tetrachloroethylene are suspected potential contaminants of concern at the Horns Rapid Landfill; therefore, it is recommended that the presence or absence of these compounds be investigated during Phase II study.

4-17 Section 4.6.3.2, p. 4-33 and Section 4.8.1.1, p. 4-43

The placement of upgradient monitoring wells for the HRL could depend on the outcome of the investigation of the relationship of the South Pit to the Hanford Site. If the South Pit is unrelated to the Hanford Site, then it seems necessary to place a well between the South Pit and the HRL to determine the nature of the incoming contamination to the HRL. The work plan should state that this well will be necessary if the South Pit is determined to be unrelated to the Hanford Site.

4-18 Section 4.6.3.9, p. 4-38

The "activity objective" sentence does not make sense (typos?).

4-19 Section 4.6.3.9, p. 4-38

A pump test at the HRL should yield some good estimates of the hydraulic properties for the immediate vicinity. However, at the HRL, the water table aquifer is apparently almost entirely in the Ringold Formation, while the Pasco Gravels also are saturated along much of the flow path between the HRL and the Columbia River. Therefore, hydraulic properties determined by a test at the HRL would not be representative of the entire flow path. Hydraulic properties for the Pasco Gravels may not need to be determined for the HRL (depending upon the outcome of the other TCE related investigations). If determination of the hydraulic properties of the Pasco Gravels becomes necessary (e.g., if it is determined that traveltime to the Columbia River is of critical interest), then an additional work item will need to be added. Hydraulic properties of the Pasco Gravels could perhaps best be estimated by using the river stage fluctuation technique.

4-20 Section 4.6.3.10, p. 4-38 and Figure 4-15, p. 4-39

It is stated that the pumping well will be designed to allow a pumping rate of up to 2,500 L/min (660 gpm). Given the design in Figure 4-15, there will be about 9-14 feet of available drawdown in the pumping well. Therefore, the maximum pumping rate (660 gpm) will require a well specific capacity of 47 gpm/ft (for 14 ft dd) or 73 gpm/ ft (for 9 ft dd). From USGS available data for wells in the general vicinity of 1100-EM-1, this appears likely for wells tapping the Pasco Gravels, but unlikely for wells tapping the Ringold (3 available specific capacity tests yielded values of 6.2, 10, and >40 gpm/ft). Given the probable specific capacity for a well tapping the Ringold and the pumping well design in Figure 4-15, the maximum pumping rate may be more in the 100 gpm range.

4-21 Figure 4-15, p. 4-39

The submersible pump size is shown as 12 hp. This is apparently a typo. We could not find specifications for a 12 hp submersible pump. To obtain the maximum pumping rate planned (660 gpm) with the estimated lift (~60 ft) will probably require a submersible pump of about 40 hp.

4-22 **Deficiency:** Section 4.6.4.11 (should be 4.6.3.11), p. 4-40

The proposed measuring period for antecedent water levels for the pumping test is too short.

Recommendation: It is stated that antecedent water levels will be measured for a period of about 25% of the anticipated pumping time. This is too short to establish antecedent conditions for a pumping test. Stallman (1983) recommends a period of at least 2 times the pumping period. We agree that the period should be increased to 2 times the pumping period. (Reference: Telephone conversation 11/1/90 with Doug Morell, Golder Associates, and Ward Staubitz, USGS)

4-23 Section 4.6.4.11 (should be 4.6.3.11), p. 4-40 and Figure 4-15, p. 4-39

Given the distance of <328 feet (for radius around pumping well in which observation wells will be measured), 2 to 4 of the MW-10 through MW-15 wells could possibly be properly positioned. However, the diagram in Figure 4-15 shows the pumping well being screened at the base of the water table unit (just above the "silt"); only well MW-14 is similarly situated while the other wells are screened at the water table. This may or may not be important (depending upon the distance between pumping and observation wells and the nature of the water table aquifer). However, any newly installed observation wells should be open to the same part of the aquifer as the pumping well.

4-24 Section 4.6.4.11 (should be 4.6.3.11), p. 4-40

Given a maximum pumping rate of ~100 gpm (see comment on 4.6.3.10) and the value of horizontal hydraulic conductivity given in the RI Phase I report (14 ft/day), the maximum distance at which a monitoring well may be effective arbitrarily defined here as where drawdown is greater than or equal to 0.1 ft after 24 hours of pumping) would be about 130 ft. This would apparently reduce the number of effective existing monitoring wells to a maximum of three (if MW-12, -13, and -14 were used).

4-25 **Deficiency/Recommendation:** Section 4.6.4.11

The pump test is to include wells presently located adjacent to the pumping well. New wells may need to be constructed to obtain draw down and recovery data during a 24 hour aquifer test. Monitoring wells probably should be placed within 100 feet of the pumping well screened within the unconfined aquifer. The possibility that data would not be obtained from the presently existing wells should be considered and that new monitoring wells or piezometers may need to be constructed. The pumped well could be placed immediately adjacent to at least one of the existing wells minimizing the number of new piezometers that might be required.

4-26 **Deficiency:** Section 4.9.3, p. 4-50

The sole use of the 0.95/0.95 upper tolerance limit to identify the source of contaminants at the Horn Rapids Landfill is arbitrary and nonconservative and therefore, not acceptable. As noted in the comments on the Phase I RI report, the background groundwater quality of the HRL is defined by water samples taken from wells at ANF. These wells monitor a contaminant plume of nitrate and TCE upgradient of the HRL. The mean concentration of TCE in the ANF wells was measured as 46 ug/L, and the one-sided UTL of the 95th percentile was calculated as 194 ug/L, approximately 20 times the MCL for TCE. By this screening procedure, the HRL could contribute TCE to the ground water resulting in a 4 ties increase in TCE concentrations, from 46 ug/L measured in the ANF wells to 184 ug/L, and still not be identified as a contaminant source.

For groundwater that is known to be contaminated, i.e., exceeding ARARs, this screening procedure is clearly inadequate. A more appropriate technique would be to statistically compare the upgradient data set with the downgradient data set via a t-test and flag those constituents that show a statistically increased concentration in downgradient wells. In the case of the HRL, this analysis would lead to the conclusion that TCE was singificantly greater in the downgradient wells than in the upgradient wells, whereas nitrate was not.

The shortcoming of the t-test analyses is that the peak of a contaminant plume originating from an upgradient source may have already passed by the Horn Rapids Landfill, resulting in greater concentrations in downgradient wells than in upgradient wells. This points out the limitation of sole reliance on any single statistical technique.

Recommendation:

Use multiple statistical techniques and an evaluation of the groundwater flow system and contaminant distribution to determine if groundwater contamination is attributable to any given operable unit.

4-27 **Deficiency/Recommendation:** Section 4.11, pp. 4-51 and 4-52

This section discusses four risk assessment refinement subtasks. While this section did address certain concerns presented previously in the Phase I RI comments, the concern regarding the toxicity screening procedure should be resolved (comment #4-41 in the enclosure to the October 16, 1990 letter from D. Einan, EPA, to R. Stewart, DOE). Resolution will be completed upon receipt and discussion of disposition comments.

4-28 **Deficiency/Recommendation:** Section 4.11, pp. 4-51

The text states that the Phase I risk assessment was developed according to "EPA 1989-0X" guidance. This was interpreted to mean that the guidance used was EPA Region X dated 1989. However, the Phase I risk assessment was developed according to EPA 1989b and EPA Region X 1990 guidance (see references). The text should clarify this discrepancy.

4-29 **Deficiency:** Section 4.11.4, p. 4-52

This section discusses risk characterization. However, it also presents risk management methods such as comparison of estimated risks with acceptable levels and the setting of priorities for final remedial action. Risk management practices are not a part of the risk characterization process. EPA 1989b, Section 8.6 states, "It is not the responsibility of the risk assessment team to evaluate the significance of the risk in a program context, or whether and how risk should be addressed, which are risk management decisions." EPA 1989b, Section 8.6.1, outlines how risk information should be presented so risk managers can use the information during the feasibility study.

Recommendation:

The risk management practices presented in this section should either be removed or placed in a separate paragraph that emphasizes the refined risk estimates should be examined and used during the feasibility study.

QA-1 **Deficiency/Recommendation:** Table 1, p. A-6

Table 1 contains several technical errors. The soil and water contractural quantitation limits (CQLs) described are the same as contract laboratory program (CLP) contract required quantitation limits (CRQLS); however, the footnote associated with the CQL heading qualifies these values. The footnote states the CQL values will be target values for initial procurement negotitations with the analytical laboratory and will be updated to reflect final negotiated values. This is not acceptable. If CLP methods are to be used to generate Level IV quality data, the CQLs or CRQLs must be attainable by the laboratory on an ongoing basis. Deviations from the CRQLs should only occur in sample specific situations when possible matrix interferences prohibit attining the CRQLs within the associated quality control limits.

The precision values for both water and soil are incorrect. The precision heading footnote describes the values as relative percent difference (RPD). RPD values are generally compound specific and in the CLP SOW for organics are determined for the spiking compounds (EPA, 1989c). The values stated in the table would be unattainable for some of the compounds and too generous for other compounds using the referenced methods. The precision of the analyses cannot be adequately measured with the values stated for both inorganics and organics.

The accuracy values for both water and soil are incorrect. The accuracy heading footnote describes the values as percent recovery (%R) values. Percent recovery values are generally expressed as a range for specific compounds. The value "$\pm$ 25" is presented as the %R values for the majority of compounds and "$\pm$ 20" is presented for the remaining compounds. The assumed intended values of $\pm$ 25% and $\pm$ 20% for both inorganic and organic compounds are not consistent with the referenced methods. The %R range of 75% to 125% may be attainable for some compounds; however, unattainable on an ongoing basis for most of the organic compounds.

Primary and secondary drinking methods are included in the table. However, it is not explained in either the text or the table when these methods will be used.

QA-2 **Deficiency/Recommendation:** Section 4.1.2 and Table 1. Have the laboratories presently being used for the 1100-EM-1 sample analyses (i.e., PNEL and Weyerhauser) submitted procedures and QA program plans? If so, is there a Table 1 for these laboratories If not, one should be included with the specific information for these laboratories.

QA-3 **Deficiency/Recommendation:** Section 7.0 p. A-23

See previous comment QA-1.

QA-4 **Deficiency/Recommendation:** Section 8.2, p. A-24

The text is incorrect and should not refer to the verification of data as data validation.

QA-5 **Deficiency/Recommendation:** Section 8.2.2, p. A-24

Data validation criteria should be stated in the text or the Westinghouse documents should be provided for comparison to EPA data validation documents.

QA-6 Section 12.1, p. A-29

The statement that "Each hazardous substance has a certain background distribution in a given environmental medium" should be justified. It is not commonly accepted to assume all hazardous substances occur naturally. Very few of the target compound list (TCL) parameters would be expected to be found in soils and water for non-anthropogenic sources. It would be technically incorrect to assume these compounds could be background. If these compounds were detected, the background sample may not represent the background or "natural" levels. Regional data on metals and the few widespread organics introduced by man, such as certain pesticides, should be consulted for background information.

QA-7 The text states "...substitute a mean value with conservatively biased estimates of the mean." Information should be provided that describes what the estimates of mean are based on.

References

EPA*, 1986. Test Methods for Evaluating Solid Waste, Volume 1A: Laboratory Manual, Physical/Chemical Methods. November, 1986.

EPA, 1989a. U.S. EPA Contract Laboratory Program, Statement of Work for Inorganic Analysis. SOW No. 788.

EPA, 1989b. Risk Assessment Guidance for Superfund, Vol. I, Human Health Evaluation Manual - Part A. Interim Final. EPA 540/1-89/002. December 1989.

EPA, 1990. Statement of Work RI/FS Risk Assessment - Region X. January 31, 1990.

EPA 1989c. Contract Laboratory Program Statement of Work of Organic Analysis.

*U.S. Environmental Protection Agency

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Author	Addressee	Incoming Correspondence No.
DR Einan/USEPA	RK Stewart/DOE-RL	9005031

Subject 1100-EM-1 RI Work Plan Supplement

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