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February 20, 2015

VIA HAND DELIVERY

Tammie J. Hynum
Hazardous Waste Division
Arkansas Department of Environmental Quality
5301 Northshore Drive
North Little Rock, AR 72118

Re: Whirlpool Corporation's Comments on the Draft Revised Remedial Action Decision Document for the Whirlpool Corporation Facility in Fort Smith, Arkansas (EPA I.D. Number ARD042755389)

Dear Ms. Hynum:

Whirlpool Corporation (Whirlpool) appreciates the opportunity to provide comments on the draft Revised Remedial Action Decision Document (RADD) issued by the Arkansas Department of Environmental Quality (ADEQ) on December 21, 2014 for the Whirlpool facility located in Fort Smith, Arkansas. Whirlpool remains committed to working with ADEQ to address the trichloroethylene (TCE) contamination at the former Whirlpool facility in a manner that is effective, continues to demonstrate no public health exposure, and is consistent with ADEQ policy and precedent.

As you know, we have undertaken extensive investigation, delineation, remediation and monitoring activities under the existing December 2013 RADD and performed a significant amount of additional, voluntary investigation and remediation work in 2014. Two important and relevant conclusions can be drawn from the data collected over the course of this work.

First, the remedial actions taken to date have achieved significant and encouraging results. Based on the fourth quarter 2014 monitoring results submitted to ADEQ, these required and voluntary actions have resulted in decreasing or stabilized concentrations of TCE in groundwater and, importantly, the separation or detachment of the on-site area of contamination from what is referred to as the "northern plume." Indeed, the 2014 data show:

- An approximate 55% reduction in TCE concentrations in the north plume “neck” area, located on the Whirlpool property in the parking area north of the northwest corner of the facility;
- An approximate 55% decrease in TCE concentrations in the north plume in Areas 2 and 3 north of Ingersoll Avenue; and
- An approximate 50% decrease in TCE concentrations in Area 1 in the south plume.

Second, the extensive monitoring data gathered, validated and shared with ADEQ continued to find no exposure pathways to the TCE, and thus no health risk to area residents.

Looking forward, as we consider the proposals set forth in the December 2014 draft Revised RADD, we believe that the path forward should be informed not only by the successful remedial actions taken to date, but also by the continued monitoring and technical evaluation required by the current RADD and currently underway for 2015. As described in more detail in the comments below, the scientific evidence does not currently support the need for a Revised RADD. Indeed, the data collected to date strongly support the conclusion that the 2013 RADD remedy is working as intended, is protecting human health and the environment, and has resulted in measurable, tangible improvements. For instance, approximately 86% of the monitoring wells exhibit either little or no trichloroethylene (TCE), or a decreasing or stable TCE concentration trend and the preponderance of environmental data show positive results from the ISCO treatment. In addition, we believe that the additional remedial actions set forth in Revised RADD are neither likely to achieve substantial additional environmental benefit nor likely to be cost-effective means of enhancing the existing remedial approach. To optimize the outcome of further remedial measures, the Revised RADD should be preceded by a thorough and informed analysis of whether and, if so, what additional remedial actions are necessary and best suited to achieve the desired outcome of this cleanup program. That analysis is the 2015 technical review contemplated by the 2013 RADD.

If, however, ADEQ continues to believe that a Revised RADD should be moved forward before completing the planned collection, validation and analysis of additional data in 2015, below we have also outlined in detail a number of comments and suggestions to help ensure that any additional requirements are based in sound-science and constitute an appropriate, effective step toward achieving the desired remediation goals.

In general, we believe that (a) certain alternative approaches to soil removal and containment and (b) targeted additional ISCO treatments should be considered in place of additional large diameter soil boring excavations or thermal desorption. We believe that large diameter soil boring excavations or thermal desorption are not the most effective methods to meet RADD goals. Thus, any consideration of possible future remedial actions should evaluate targeted shallow zone soil removal along the linear drainage feature instead of large diameter borings and thermal desorption and the possibility of targeted additional ISCO treatment in the vicinity of the linear drainage feature. We discuss these potential remedial approaches in more detail in the attached comments.

Finally, any Revised RADD must also modify certain specific provisions in both the existing 2013 RADD and the current proposal to take account for our experience with the remedial actions to date and the success we have achieved. Thus, Whirlpool is suggesting a number of specific modifications to the ongoing monitoring program and to the scope and timing of the 2015 technical review. Whirlpool's specific suggestions include: (i) revising Paragraphs 13 and 14 of the 2014 Revised RADD related to identification and reporting of new unidentified areas of concern and new releases, (ii) modifying the December 31, 2015 technical review to provide clear criteria (along the lines set forth in Whirlpool's comments) for evaluating and recognizing the overall effectiveness of remedial actions; and (iii) adjusting the monitoring program as set forth in Whirlpool's attached comments to account for the data collected to date.

In summary, for the reasons further set forth below, Whirlpool respectfully requests that ADEQ withdraw the Revised RADD and its proposal for additional large diameter soil borings and a thermal desorption project and defer consideration of any new remedial actions until after the required 2015 monitoring and the submittal of the December 2015 technical review. While the 2015 technical review may demonstrate that the current remedial actions have been successful and that additional remedial action is unnecessary, it is also possible that, based on the ongoing monitoring, the 2015 technical review will identify targeted additional remedial actions that could enhance the work Whirlpool has done to date.

Thank you for your attention to this matter. Whirlpool looks forward to continuing to work with ADEQ to resolve these matters and to move forward with Whirlpool's commitment to perform a sound, science based remedy at the Ft. Smith facility.

Sincerely,



Laurence W. Prange

Whirlpool's Comments on the Revised RADD

I. The Revised RADD is Premature and Unnecessary

ADEQ issued a RADD for the Whirlpool facility in December 2013 in connection with a Consent Administrative Order (CAO) between ADEQ and Whirlpool. The December 2013 RADD specified the remedial actions to be taken at the site to reduce concentrations of TCE in soil and groundwater during an extremely aggressive two-year remediation schedule, as well as specific measures to evaluate the effectiveness of those remedial actions over the same two-year period. ADEQ's proposal to revise the RADD and the remedial actions contained therein after only one year is premature, particularly in light of the documented effectiveness of the existing remedial approach. Indeed, the data collected to date provide no information or evidence to suggest that the remedial actions adopted by the 2013 RADD have been ineffective. To the contrary, the data collected to date strongly support the conclusion that the 2013 RADD remedy is working as intended, is protecting human health and the environment, and has resulted in measurable, tangible improvements.

To address TCE concentrations in groundwater, the December 2013 RADD required a series of in-situ chemical oxidation (ISCO) injections in three areas: the on-site area where historic degreasing operations occurred (Area 1) and two off-site areas (Areas 2 and 3). The ISCO injections were designed to provide chemical treatment to reduce elevated TCE concentrations in groundwater. The December 2013 RADD also required Whirlpool to perform groundwater monitoring for a *two-year period* to evaluate the progress of the ISCO treatments, in combination with ongoing monitored natural attenuation processes, in reducing TCE concentrations in groundwater.

Whirlpool has timely submitted the 2014 Annual Report and progress reports to ADEQ for the first four quarters of this two-year period. Under the express terms of the December 2013 RADD, there are four more quarters of monitoring and reporting to be performed. The reports submitted to date, particularly the 2014 Annual Report and reports for the third and fourth quarters of 2014, document the effectiveness of the existing remedial approach in addressing TCE concentrations in groundwater. The monitoring data collected shows -- after only one year of the program -- decreasing or stable concentrations of TCE in the majority of monitoring wells, both on-site and off-site, as well as the following:

- Separation of the groundwater plume into a north plume and south plume;
- An approximate 55% reduction in TCE concentrations in the north plume "neck" area, located on the Whirlpool property in the parking area north of the northwest corner of the facility;
- An approximate 55% decrease in TCE concentrations in the north plume in Areas 2 and 3 north of Ingersoll Avenue; and
- An approximate 50% decrease in TCE concentrations in Area 1 in the south plume (based upon the 30-day ISCO monitoring event performed in early December).

In addition, the monitoring data collected in 2014 provides direct evidence that natural attenuation is actively occurring through chemical and biological processes, as evidenced by the presence of TCE degradation products in groundwater sampled in monitoring wells that has not been affected by ISCO treatment.

As noted, the December 2013 RADD expressly requires submission of a technical evaluation report on December 31, 2015. The December 2015 report was intended to provide a comprehensive evaluation of the effectiveness of the remedial actions required by the December 2013 RADD and an evaluation of what further remedial actions, if any, might be appropriate. December 2015 was selected and approved by ADEQ as the proper timeframe for compiling this report to ensure the collection of sufficient data and well-grounded scientific and engineering analyses in order to make an informed judgment of whether further remedial action is necessary.

The Revised RADD essentially “jumps the gun” and cuts the requisite data collection process in half. There is no exigency or new circumstance that warrants such precipitous action. Indeed, the data collected to date suggests that the ISCO injections have been working as intended and that there is no new threat or risk to human health or the environment. By failing to allow sufficient time to monitor groundwater concentrations and undertake a comprehensive analysis of the effectiveness of the remedial actions, and by ignoring the substantial progress and effectiveness demonstrated by the data collected in 2014, the Revised RADD is premature and lacks the sufficient scientific and technical bases recognized by ADEQ in the December 2013 RADD.

II. Further Remedial Action Is Not Necessary To Protect Human Health or the Environment and Thus Is Not Authorized By The Consent Administrative Order

The CAO specifically requires Whirlpool to implement the December 2013 RADD. (CAO, at ¶ 9.) The CAO does not authorize ADEQ to modify the RADD or the remedial measures contained therein unless ADEQ determines that a release or potential release of hazardous substances from the site poses an imminent threat to human health and the environment, in which case ADEQ may require interim corrective measures. (CAO, at ¶ 10.) The Whirlpool site does not pose an imminent threat to human health or the environment and, as such, the proposed amendment to the 2013 RADD is precluded by the existing CAO, absent amendment of the CAO.

Moreover, as explained below, the additional remedial actions proposed in the Revised RADD are admittedly not necessary to protect human health or the environment and thus are unwarranted at this time. *See* A.C.A. § 8-7-502(a) (“It is the intent of the General Assembly to provide the state with the necessary authority and funds to investigate, control, prevent, abate, treat, or contain releases of hazardous substances *necessary to protect the public health and the environment*. . . .”) (emphasis added); A.C.A. § 8-7-508(a)(1) (authorizing ADEQ to require remedial actions “*as are necessary* to investigate, control, prevent, abate, treat, or contain any releases or threatened releases of hazardous substances from the site”) (emphasis added).

A. The Existing Remedial Approach Is Adequately Protective of Human Health

With respect to off-site conditions, the Revised RADD correctly concludes that off-site groundwater does not present risks to residents or others above ADEQ target risk levels. (Revised RADD, at 8.) The Revised RADD further correctly finds that off-site groundwater could pose a long-term risk to residents only to the extent that it is used for potable purposes in the future -- a situation which ADEQ acknowledges does not exist today. As ADEQ has been informed, Whirlpool is engaged in discussions aimed at settling pending claims by affected residents on terms that both financially compensate residents for any lost property value on account of the contamination and require residents to deed restrict their properties to prevent any future groundwater use unless and until ADEQ concludes that such use would not pose a human health risk. Whirlpool is optimistic that satisfactory settlements achieving these goals can be reached, as a result of which the possibility that TCE-contaminated groundwater would be used in the future without ADEQ approval will be highly remote.

As ADEQ further correctly concludes in the Revised RADD, the conditions at the site itself do not pose a significant risk to human health. For example, with respect to on-site conditions, the Revised RADD states that risks to workers from on-site contaminated soils do not exceed ADEQ's target risk levels for either cancer endpoints or non-cancer endpoints. (Revised RADD, at 7.) Similarly, although the Revised RADD finds that vapor intrusion from on-site groundwater could potentially pose a risk to future on-site workers that exceeds ADEQ's non-cancer target hazard index of 1, these risks can be mitigated in advance of any such potential, future worker exposures to acceptable levels through the existing remedy, which includes a deed restriction prohibiting development in Area 1 and the implementation of containment, including a soil cover, to prevent future contact.

Given the foregoing correct conclusions in the Revised RADD, it is clear that the current remedy is adequately protective of human health and that the proposed additional remedial actions are not warranted on grounds that they are necessitated by risks that need to be reduced further.

B. The Proposed Remedies May Not Meaningfully Enhance Achievement of Remedial Action Levels (RALs)

The Revised RADD proposes that Whirlpool implement either additional large diameter borings to remove soil or a pilot test for thermal desorption. (Presumably, if the thermal desorption proved to be cost effective, additional thermal desorption treatment would follow the pilot test.)

As a preliminary matter, the Revised RADD's description of these proposed remedial actions is unnecessarily vague and fails to provide sufficient detail to understand the scope of the proposed remedial activities. For example, the Revised RADD is unclear as to the depths of excavation proposed through large diameter borings or the location of the large diameter borings. It is similarly unclear as to the scope of the thermal desorption. Based on discussions with ADEQ, Whirlpool understands that the remedial actions set forth in the Revised RADD are more precisely defined as follows:

The Revised RADD would propose **either** soil removal through the use of four foot diameter soil borings **or** thermal desorption to further remove TCE from on-site soils. Both soil removal and thermal desorption are intended to address the presence of TCE above the RAL in on-site vadose zone soils in the linear drainage feature area. If soil removal is conducted, neither the thermal desorption pilot, nor further thermal desorption would be necessary. If thermal desorption is pursued in place of soil removal, a pilot project is first required to demonstrate the effectiveness of thermal desorption.

Although Whirlpool **does not concur** with these proposed remedial actions, at a minimum, the specific description of the actions set forth above is necessary so that any proposed revision to the 2013 RADD clearly sets forth for ADEQ, Whirlpool, and the public exactly what additional remedial actions are being contemplated.

More importantly, Whirlpool does not agree with the proposed remedial actions because neither the soil removal through large diameter borings nor thermal desorption would materially further achievement of RALs in groundwater for the northern plume found in the residential area. In particular, as ADEQ recognizes in its January 23, 2015 correspondence, on-site soils in the vicinity of Area 1 are not currently contributing to the northern TCE plume and, therefore, Area 1 is not impacting the rate of TCE degradation in that plume. As ADEQ recognizes in the Revised RADD, there is a groundwater divide along Ingersoll Avenue. Area 1 is south of the divide, and groundwater south of the divide flows in the south/southeasterly direction -- *i.e.*, away from the northern plume. In addition, Whirlpool's ISCO injections in the "neck" area have begun to create further separation between the northern and southern plumes. This separation can be seen by the fact that TCE concentrations in a number of wells in the "neck" area already have achieved or are approaching the RALs. Given this separation, further work in the vicinity of Area 1 will not have any impact on the northern plume.

While further work in the vicinity of Area 1 could, in theory, impact groundwater concentrations in the southern plume, the remedial actions proposed will not have a significant impact on groundwater TCE concentrations before December 2015. First, additional large diameter borings will not significantly diminish the need to install a cover to provide containment for TCE impacted soils that will remain in this area since the large diameter borings admittedly only remove 25% of the impacted soil and the borings cannot be performed in locations with underground utilities. Second, thermal desorption is likely to present significant challenges that will hinder its effectiveness, including: (a) the difficulty of conducting the treatment over relatively small areas; (b) the potential interference from the manufacturing building, the electrical substation, and underground electrical utilities; and (c) the inability to treat TCE in the saturated zone (due to inefficiencies of thermal desorption in the saturated zone), which appears to be the primary source of TCE concentrations found in groundwater in the southern plume.

Accordingly, the additional proposed remedial actions will not materially advance the goal of meeting the RALs for groundwater. In fact, the containment remedy already set forth in the December 2013 RADD is likely to have as much of a beneficial impact on groundwater TCE concentrations as either of the proposed additional remedial actions because it mitigates stormwater infiltration in the source area and thus reduces recharge of the TCE from all of the impacted soils to groundwater, not just some of them.

III. The Revised RADD Does Not Fully Evaluate Alternative Remedial Actions

A. ADEQ Should Consider and Evaluate Other Remedial Alternatives for On-Site Soils and Groundwater

While additional soil removal or thermal desorption is not necessary to protect human health or to accelerate TCE degradation in the off-site groundwater, it is clear that the methods ADEQ has chosen are neither cost-effective nor as technically implementable as other methods of removing TCE from on-site soil. As a result, ADEQ should consider and evaluate methods of addressing on-site soils other than either the large diameter borings or the thermal desorption. In particular, ADEQ should evaluate:

- (a) excavation of the top two feet of soils exceeding the TCE RAL in the vicinity of the linear drainage feature and placement of two feet of clay cover in excavated areas; and/or
- (b) an additional ISCO injection into the saturated zone in the linear drainage feature.

These actions may well provide several advantages in comparison to large diameter borings or thermal desorption:

- Excavation of the top two feet of soil containing TCE in the vicinity of the linear drainage feature removes a similar mass of contaminated soil compared with large diameter borings and is more practical and cost-effective.
- A two foot excavation, followed by the placement of a clay cover, creates a uniform surface cover of clean soil that provides greater redevelopment value and a superior remedy considering the containment of the underlying impacted soil than would an excavation based on large diameter borings removing 25% of the impacted soil.
- A two foot excavation could be performed without abandoning and closing the 9 existing permanent monitoring wells and 19 ISCO injection wells in the linear drainage feature.
- The placement of a clay cover provides an additional enhancement to containment by serving as an additional barrier for soil vapor migration and stormwater infiltration.
- An additional ISCO injection event in the linear drainage feature could be expressly targeted to the saturated zone where TCE concentrations remain the highest and would likely result in the removal of as much or more TCE than would soil removal in this area. Significantly, an ISCO injection is a more cost-effective manner of eliminating TCE than either thermal desorption or soil removal. In addition, because it can be targeted to the saturated zone, where thermal desorption is less efficient, it may also have the most potential impact on reducing TCE concentrations to facilitate plume stability for the southern plume.

- ISCO injection is substantially more cost-effective due to the 19 existing injection wells in the linear drainage feature (see Figure 1 from Attachment C, Third Oxidant Injection Summary Report of the 2014 Fourth Quarter Progress Report).
- The excavation of the upper two feet of soil will not damage any of the Dehalococcodes (DHC) microbes present in the linear drainage feature at MW-38 while performance of thermal desorption in the saturated zone would sterilize the soil destroying the DHC microbes in the treatment zone.

B. Northern Plume Groundwater

The revised RADD appears to suggest additional ISCO treatment in two areas: in the vicinity of the source area (understood to be the linear drainage feature) and in the vicinity of well IW-77. As stated above, any additional ISCO in the vicinity of the linear drainage feature should be expressly targeted to the saturated zone where TCE concentrations remain the highest.

With respect to off-site groundwater, it is unclear whether, by identifying the area in the vicinity of IW-77, the Revised RADD is requiring the installation of new injection points or is referring to additional ISCO injections in existing Areas 2 and 3 and the Neck Area (Figures 5 and 6 in the Revised RADD each depict Area 1). The highest off-site groundwater TCE impact no longer exists at IW-77 due to the successful ISCO injections in Areas 2 and 3 as discussed below (Section VII). An additional round of ISCO injections in one or more of Areas 2 and 3 and the Neck Area would be substantially more cost effective than the installation of new injection points within close proximity to these existing injection arrays. Because the 2014 data has already demonstrated a separation of the northern plume from Area 1 in the vicinity of the Neck Area, further injections are not necessary. Nonetheless, an additional round of ISCO injection would provide further separation between the northern and southern plumes and would reduce, if not eliminate, any potential concerns for rebound.

C. The 2015 Technical Effectiveness Review

Based on the monitoring data collected to date, the 2013 RADD's reporting and evaluation requirements for 2015 should be adjusted to better manage the flow of data and information to ADEQ. If the revised RADD continues to propose any additional remedial action beyond that set forth in the 2013 RADD, both the criteria and the deadlines for the technical effectiveness review must change to account for such additional remedial actions.

The Revised RADD currently calls for the December 31, 2015 submission of a technical review of the remedial activities and the status of remediation. It notes that the technical review "shall assess the need for necessary further action beyond continued MNA [monitored natural attenuation]. If after two years, there is not a significant reduction in COC's, Whirlpool will be required to submit plans for a separate remedial alternative to address subsurface soils and on and off-site groundwater." *Revised RADD at §11, p.22.* This language, which is carried over from the 2013 RADD, *fails to acknowledge that the Revised RADD has supplanted this technical review and has already proposed separate remedial alternatives to address*

subsurface soils and on and off-site groundwater. As a result, the Revised RADD requires a re-thinking of both the purpose, timing, and criteria for the technical review.

Most importantly, the 2015 technical review must evaluate both the remedial actions under the 2013 RADD and any additional remedial actions with clear criteria rather than the vague criterion of a “significant reduction in COC’s” -- a criterion which arguably has already been achieved. Any technical review should evaluate the remedial actions on the basis of the following three criteria:

- (a) whether remedial actions have addressed the pathways and potential risks identified in the RADDs;
- (b) whether the remedial actions have created and maintained separation between the on-site soils and the off-site groundwater such that on-site conditions are no longer a source to TCE in off-site groundwater; and
- (c) whether the technical evidence supports the continued occurrence of MNA, such that there is reason to conclude that off-site groundwater conditions, when taken as a whole, are stable or improving;

In addition, the technical review should be allowed sufficient time to incorporate 2015 monitoring data and to evaluate any additional remedial activities. Thus, if the Revised RADD continues to propose additional remedial activities, the technical review, the 2015 Annual Report, and the 2015 Fourth Quarter progress report should all be due on January 29, 2016 so that these reports and the data they contain can be fully integrated.

IV. Additional Modifications to the Revised RADD are Required to Accommodate Redevelopment

The Revised RADD contains a provision which requires that the foundation of the manufacturing building remain in place and be monitored in order to prevent infiltration of stormwater through the soil. *See Revised RADD §9A, p.19.* As ADEQ is aware, Whirlpool has been working with the City of Fort Smith to develop the Whirlpool property. Although there are no current plans to demolish the manufacturing building or to remove the floor and foundation, it is possible that a future owner of the building may wish to modify its use, remove some portions of the building, or take other measures that could impact the floor and foundation. The Revised RADD should be modified to state that (a) the floor and foundation provide containment precluding surface water infiltration and should remain in place as a component of the remedy, but that (b) to the extent that the floor or foundation is removed in whole or in part in the future, further investigation of subsurface soils may be necessary depending upon the specific location and available soil and groundwater data for the respective location for floor and foundation removal.

V. Paragraphs 13 and 14 of the Revised RADD Are Too Vague to Be Included in a CAO

Paragraphs 13 and 14 of the Revised RADD address identification, reporting, and potential remediation of new areas of concern and/or new releases *other than the known and targeted contamination*. These provisions include open-ended and vague language regarding the selection and implementation of undefined remedial actions to address as-yet unidentified situations. It is not clear that ADEQ could order Whirlpool to commit to remedy conditions that neither Whirlpool nor ADEQ know to exist, much less require undefined remediation of those unidentified and unknown conditions, *if any*. The inclusion of undefined remediation requirements beyond the basic reporting requirement in Paragraphs 13 and 14 in the Revised RADD at this time raises significant problems both of compliance for a respondent and of enforceability for the Agency. *See, e.g., Friends of the Earth, Inc. v. Laidlaw Environmental Services (TOC), Inc.*, 528 U.S. 167, 193 (2000) (holding that “courts should aim to ensure ‘the framing of relief no broader than required by the precise facts.’”) (internal citations omitted). These paragraphs should be limited to reporting requirements only. Whirlpool is amenable to discussing with ADEQ what the Agency intends by these two vague and unbounded paragraphs and to addressing its legal obligations under Arkansas law with respect to any conditions other than those properly addressed in the December 2013 RADD and the CAO.

VI. Groundwater Monitoring Requirements Should Be Changed in the Revised RADD

As Whirlpool’s 2014 Annual Progress Report made clear, Whirlpool has collected a substantial volume of monitoring data. This data demonstrates that conditions are sufficiently stable or improving. Therefore, required monitoring should be adjusted from quarterly to semi-annual on a going forward basis, and any Revised RADD should also contain sufficient flexibility to allow ADEQ and Whirlpool to agree on a subset of monitoring wells from which data should be collected in each semi-annual event.

As of 2015 Whirlpool has been monitoring volatile organic compounds (VOCs), field parameters, and monitored natural attenuation (MNA) parameters as described within the current RADD for four consecutive quarters. Whirlpool also has years of historical VOC monitoring dating back to the late 1980’s for the site. As discussed within the Environmental Protection Agency (EPA) guidance document *Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites* (April 1999), “modification of the (MNA) program, including increases or decreases in monitoring parameters, frequency, or locations, may be warranted to reflect changing conditions or improved understanding of natural attenuation processes at the site”. Generally, Whirlpool proposes semi-annual groundwater monitoring for all wells identified in the revised RADD; however, recently installed wells will be monitored quarterly until four quarters of data has been collected (i.e. monitoring wells at the northeast corner and on the Boys and Girls Club property).

In addition, due to the amount of data collected, Whirlpool has a much improved understanding of MNA processes at on-site and off-site locations; and therefore, is requesting modifications to the parameters monitored specifically for MNA purposes. Continued quarterly monitoring of the full suite of MNA parameters will not improve or change conditions affecting MNA.

After four quarters of sampling for all of the MNA parameters listed in Table 3 of the December 2013 RADD, a very good baseline of groundwater conditions at on-site and off-site locations has been established. At this time it is important to collect additional data that will provide indications of changes which may affect the rate or extent of natural attenuation versus the baseline already established. Given our current site understanding, reducing both the number of parameters sampled and the locations where the samples are collected is appropriate. We request to modify Table 3 of the December 2013 RADD to include only the following sample parameters:

- DHC at select wells that have historically shown the presence of these dechlorinating microbes;
- Temperature, pH, specific conductance, dissolved oxygen, oxidation-reduction potential (ORP), and turbidity (water quality criteria evaluated in the field during well purging activities);
- Ferrous iron at select wells where total iron has been noted in the last four quarters as being greater than 1 mg/L, although monitoring of ferrous iron at a specific well location would discontinue if the concentration of ferrous iron falls below 1 mg/L for two or more consecutive sampling events;
- Nitrate/Nitrite at select wells where concentrations have been detected above 1 mg/L since nitrate/nitrite may compete with the reductive pathway, although monitoring of nitrate/nitrite at a specific well location would discontinue if the concentration of nitrate/nitrite falls below 1 mg/L for two or more consecutive sampling events;
- Sulfate at select wells where concentrations have been detected above 20 mg/L since sulfate may compete with the reductive pathway, although monitoring of sulfate at a specific well location would discontinue if the concentration of sulfate falls below 20 mg/L for two or more consecutive sampling events; and
- Total Organic Carbon (TOC) at select wells where TOC has been detected, although monitoring of TOC at a specific well location would discontinue if the concentration decreases below detection limits for two or more consecutive sampling events.

The MNA parameters proposed to be removed from groundwater monitoring include: methane; ethane; ethane; hydrogen; vinyl chloride reductase; volatile fatty acids; ferric iron (Iron III); manganese; carbon dioxide; acetylene; sulfide; chloroethanol; alkalinity; chloride; phosphate; and, ammonia. Four quarters of monitoring data is available for the MNA parameters identified in Table 3 of the current RADD; therefore, the concentration ranges for these parameters are well documented and further analysis of these parameters will not aid in the on-going assessment of MNA.

VII. Specific Comments on Particular Statements in the Revised RADD

Finally, Whirlpool offers a number of minor comments on specific statements in the Revised RADD as noted below. These comments address changes necessary to update the revised RADD with the latest information. Further details or technical basis for these specific comments can be provided as required for subsequent modifications to the revised RADD.

- Page 1 – The December 2014 Draft RADD discussion accurately describes the current site since the warehouse portion of the property was sold to Spartan Logistics in September 2014. However, the figures attached to the revised RADD have not been updated. Whirlpool will submit revised figures.
- Page 4 – The revised RADD only describes two rounds of ISCO. A very successful third round of ISCO was performed in Area 1 and the linear drainage feature in November 2014.
- Page 4 - Large Diameter Borings were extended to bedrock and backfilled with limestone gravel in the saturated zone to passively adjust naturally low groundwater pH (to assess enhancement of MNA), and backfilled with lean cement in the vadose zone.
- Page 5 – The TCE concentration in groundwater at IW-77 is 554 µg/L (December 2014), which is significantly less than 1,000 µg/L.
- Page 5 – The TCE concentration in groundwater at MW-33R is 799 µg/L (December 2014), which is less than 1,000 µg/L (MW-33R is the two-inch diameter replacement well for MW-33 which was a ¾-inch diameter monitoring well).
- Page 10 – “The remedial action includes alternatives to reduce concentrations of TCE in the soil and groundwater at the source and eliminate the source to the off-site groundwater plume which will ultimately reduce the concentrations in off-site groundwater.” The impacts in Area 1 and the linear drainage feature do not contribute to the off-site groundwater plume as confirmed by ADEQ in correspondence dated January 23, 2015 (Area 1 Response Report comments).
- Page 10 - The remedial action consisting of the third ISCO event successfully reduced TCE concentration in saturated soil and groundwater (see above comment).
- Page 10 - The discussion of “geologically downslope of the source area” and the presence of a depression in the surface of the weathered shale at IW-77 should be removed based upon the current understanding of the shale surface presented on Figure 2-5 from the 2014 Annual Report.
- Page 10 – The Revised RADD states that: “Remedial action to reduce the TCE levels in the areas of elevated concentrations near well IW-77 will ultimately reduce the concentrations down-gradient in the northern plume which extends beneath the off-site

residential area.” The revised RADD should acknowledge that the TCE concentration at IW-77 has already been reduced as noted above.

- Page 15 – “The building foundation should remain in place and be monitored in order to prevent infiltration of surface water through the soil.” The interior of the building has been investigated via performance of 55 membrane interface probes (MIPs) to screen soil and groundwater conditions and performance of 10 soil probes and 3 groundwater monitoring wells. The investigation performed to date has identified select areas where the soil RAL has been exceeded; however, no gross soil impact has been discovered suggesting the presence of supplemental sources of groundwater impact beneath the building.
- Page 19 – Elevated temperatures during thermal desorption will sterilize the soil destroying any microbes present in the treatment area. Therefore elevated temperatures following thermal desorption in the respective treatment area will not enhance biological destruction of residual TCE in the treatment area.

Whirlpool remains committed to conducting a robust environmental remedy at the Ft. Smith property that is based on sound science, that protects human health and the environment, and that allows redevelopment of the property to proceed so that the property can be returned to productive use. We hope that ADEQ will give serious and careful consideration to these comments, which we have tried to make in a productive manner. We look forward to working with ADEQ, the City, and the community within the regulatory process to come to an appropriate path forward.