

## **DRAFT REQUEST FOR ADDITIONAL INFORMATION (D-RAI) FOR ENVIRONMENTAL REVIEW**

Renewal of Source Materials License SUB-526 Honeywell International Inc.  
Metropolis Works, Metropolis, Illinois

### **INTRODUCTION**

The purpose of these requests for additional information (RAIs) is to obtain additional information and data that are necessary for the U.S. Nuclear Regulatory Commission (NRC) to fulfill its responsibilities under the National Environmental Policy Act of 1969 (NEPA). The NRC staff will prepare an environmental assessment (EA) pursuant to 10 CFR 51.21 and 10 CFR 51.30. The staff will use the guidance in NUREG-1748, "Environmental Review Guidance for Licensing Actions Associated with Nuclear Material Safety and Safeguards Programs," especially Chapter 3, to prepare the EA. To support its environmental reviews, the NRC's regulations in 10 CFR 51.45 and 10 CFR 51.60 address the need for a licensee or applicant to submit an environmental report (ER). Chapter 6 of NUREG-1748 provides guidance regarding the contents of an ER.

### **D-RAI – GEN-1**

NUREG-1748, Section 6.3, states that the applicant should focus on baseline conditions (i.e., status quo) when describing the affected environment. Baseline conditions should represent the most current conditions based on available data. The Honeywell ER presents data for the resource areas from 2010 to 2014 where applicable. Because the license renewal request is for 40 years, the NRC requests that data presented in the ER be updated to reflect data from 2006-2010 and from 2015 and 2016 where available for all resource areas.

### **D-RAI – PA-1**

Provide a figure similar to ER Figure 1.0-1 of the 1000-acre site that has a larger scale and clearly shows the Metropolis Treatment Works (MTW) site boundary and the MTW restricted area boundary. The figure should depict the following (they can be shown on multiple figures, as long as the figures also include the boundaries of the MTW site and restricted area):

- any MTW facilities outside the restricted area (for example, ER Section 2.1.2.3.8 mentions an inactive landfill and associated ground water monitoring)
- the four streams on the property (mentioned in ER Section 3.4.1), the effluent ditch, and any other drainage channels (see RAI – SW-1)
- wetlands on the property (mentioned in ER Section 3.5.2.4)
- locations of the outfalls

### **D-RAI – PA-2**

NUREG-1748, Section 6.2.1.2, states that the applicant should provide a detailed description of the proposed action. Honeywell should include enough information to provide a basis for the environmental analysis. Planned and previous upgrades (since 2005) are listed in ER Section 1.1. These upgrades include the completion of the surface treatment facility, replacement of the

oil-cooled rectifiers with water-cooled rectifiers, addition of a new cooling tower, addition of a new sewage treatment facility, seismic/tornado protection upgrades, and treatment upgrades planned for the Environmental Protection Facility (EPF) to comply with fluoride discharge limits. However, the ER does not indicate the bases for these upgrades and how the upgrades modified the associated environmental impacts. As specifically noted for each item below, discuss the environmental impacts associated with these upgrades, quantifying where possible. Positive impacts should also be included.

The following information is needed for each of these upgrades.

- A. Provide the reason(s) for adding the surface treatment facility to the EPF. Describe how its operation has affected environmental impacts.
- B. Provide the reason(s) for the replacement of the oil-cooled rectifiers with water-cooled rectifiers (such as for aging management). Identify what improvements in environmental impacts were gained with their installation.
- C. Identify the reason(s) for installing a new cooling tower to cool the waste heat from the new rectifiers. For example, did the new tower replace a previous cooling tower to address aging management considerations? Describe and quantify how the discharge temperature changed as compared to previous operations and the resulting environmental impacts.
- D. Identify any changes in environmental impacts (including positive impacts) associated with the new sewage treatment facility and identify why a new sewage treatment facility was constructed.
- E. Provide a summary description of why seismic/tornado upgrades were performed and how these upgrades improve potential environmental and public health and safety impacts.
- F. Honeywell had submitted a decommissioning plan for Ponds B, C, D, and E that the NRC evaluated in an EA in 2013. ER Section 2.1.2.2.3 states that Ponds B, C, and E have been removed from service but still need to be “closed.” Pond D is still to be removed from service and closed after treatment upgrades bring it into compliance with discharge limits. Describe the timeframe and the approach to removing Pond D from service and how all of the ponds will be closed in compliance with Resource Conservation and Recovery Act (RCRA) requirements. If the method of closure has not been finalized, provide a status of this process.
- G. ER Section 2.1.3 indicates that solids, including fluorides and uranium, are settled out in Pond D and in the future, will be treated with enhanced removal processes in the EPF before release of the effluent to the Ohio River. Describe and quantify how environmental impacts will be improved with the EPF treatment upgrades, including reduced risk to ground water contamination and possible reduction in contaminant concentrations discharged to the Ohio River.

### **D-RAI – PA-3**

NUREG-1748, Section 6.2.1.2, states that the applicant should provide a detailed description of the proposed action. Honeywell should provide enough information to provide a basis for the environmental analysis. Describe other potential major upgrades or mitigation systems that are

anticipated over the 40-year license period that could have environmental or mitigative impacts, including those that could occur as part of aging management, and their possible environmental impacts.

#### **D-RAI – PA-4**

10 CFR 20.1406(c) requires that “Licensees shall, to the extent practical, conduct operations to minimize the introduction of residual radioactivity into the site, including the subsurface, in accordance with the existing radiation protection requirements in Subpart B and radiological criteria for license termination in Subpart E of this part.” Clarify how the facility operations and procedures minimize subsurface contamination and facilitate decommissioning.

#### **D-RAI – PA-5**

Potential contamination concerns associated with the process sewers (as mentioned in ER Section 3.4.8.3.2) highlight the importance of being able to find and monitor subsurface contamination, especially in light of a 40-year operational period. Identify whether and how monitoring programs have been or would be modified to meet the requirements of 10 CFR 20.1406(c) and 10 CFR 20.1501(a) and (b) and the guidance in Regulatory Guide 4.22. Please provide any documentation available now that describes monitoring and surveys related to these requirements.

#### **D-RAI – PA-6**

ER Section 1.0 states that the MTW site is located about 1 mile west of Metropolis and ER Sections 3.2 and 3.10.4 state that it is 2 miles from Metropolis. Resolve this discrepancy, giving more detail on the measurement (i.e., from the center of the restricted area to the boundary of Metropolis, from the eastern boundary of the restricted area or the site).

#### **D-RAI – PA-7**

ER Section 3.1.2 states that the restricted area is 59 acres. The NRC’s 2006 EA and 2007 TER state that it is 54 acres. Clarify the acreage and, if the acreage has changed since 2007, identify the reason for the change.

#### **D-RAI – PA-8**

ER Section 3.1.3 states that the buried natural gas transmission line crosses the property about 60 feet north of the administration building. The NRC’s 2006 EA had stated that it is located 500 feet north of the administration building. Clarify this apparent discrepancy.

#### **D-RAI – PA-9**

The ER makes different references to ‘ponds.’ These references include uranium settling ponds (or settling ponds or ponds 3 and 4), EPF ponds, Ponds B – E (also called the CaF<sub>2</sub> ponds, RCRA ponds and settling ponds), and surface impoundments. Other references are made to ‘ponds,’ such as on page 3-9 of the ER (“...Additional samples obtained from borings drilled in May 2010 on the berms between the ponds...”), that are unclear as to which ponds are being referenced. Clarify the use of terminology for referencing the names of ponds in the ER.

### **D-RAI – ALT-1**

Section 102(2)(E) of Title 1 of NEPA states that government agencies shall “...study, develop, and describe appropriate alternatives to recommended courses of action in any proposal...” One reasonable alternative that the NRC will be considering is a license renewal period of less than 40 years, such as continuing with the current 10-year license renewal periods, or considering an alternative renewal period between 10 and 40 years. Describe environmental impacts associated with operations occurring over a period less than 40 years, such as 15 years. The NRC understands that for many resource areas the impacts may be proportional because impacts associated with the Proposed Action are in many cases annualized. In this case, a broader statement covering multiple resource areas can be provided.

### **D-RAI – ALT-2**

ER Section 2.1.1 on the No Action Alternative states that “...Honeywell would begin the process of license termination in accordance with 10 CFR 40.42.” ER Section 2.1.4 on decontamination and decommissioning states that “...Honeywell will decommission MTW...” State whether decommissioning under the Proposed Action as described in ER Section 2.1.4 will follow the same process as that stated for the No Action Alternative as described in ER Section 2.1.1. If there are any differences in the decommissioning approach depending on the alternative, state and explain these differences.

### **D-RAI – LU-1**

ER Section 3.5 states that the restricted area covers about 5 percent of the license area and the remaining 95 percent of the property has remained “mostly undeveloped.” Clarify what is meant by “mostly.” Is this referring to the approximately 100 acres of cropland on MTW property on the other side of U.S. Highway 45? If not, what other parts of the property have been developed and for what purpose?

### **D-RAI – TRN-1**

ER Section 4.2 only addresses the radiological impacts associated with transporting radioactive materials. The discussion of impacts should also address nonradiological impacts of transportation accidents or incidents, involving the transport of workers, input chemicals, byproducts, and waste. Summarize the consequences that could occur from chemical accidents during transportation and mitigation measures taken to protect workers and the public. [Note: This may be at least partially addressed through contractor research, depending on the content of the Integrated Safety Analysis Summary and the safety evaluation report that the NRC would develop.]

### **D-RAI – TRN-2**

Provide the annual or daily number of truck and rail shipments of materials or wastes that are in addition to the 650 uranium ore shipments received each year. Identify if the number of these shipments is expected to change over the 40-year period.

### **D-RAI – GEO-1**

ER Section 3.3.1 states, “The MTW site is located in the northern section of the Coastal Plains physiographic province and is underlain by deposits of Mesozoic age and younger.” This sentence is confusing and likely not accurate. Clarify if the site is underlain by deposits of

Paleozoic age and younger, or that it is underlain by deposits of Quaternary age and older. Provide a more accurate summary of the stratigraphy underlying the site. Provide the following reference that is the primary source for the geology discussion in the ER:

**Honeywell 2015. Response Notice of Deficiency of RCRA Waiver Modification, U.S. EPA ID No. ILD 006 278 170. October 28, 2015.**

#### **D-RAI – GEO-2**

ER Section 3.3.1 contains descriptions of strata that are inconsistent with the following ISGS quadrangle maps:

- 1. Nelson, W.J., and J.M. Masters, 2008, Geology of Joppa Quadrangle. Massac County, Illinois. Illinois Geologic Quadrangle Map IGQ Joppa-G. Illinois Department of Natural Resources. Illinois State Geological Survey (ISGS) (Sheets 1 and 2 of 2)**

and

- 2. Nelson, W.J., J.M. Masters, and L.R. Follmer, 2002, Surficial Geology Map, Metropolis Quadrangle, Massac County, Illinois: Illinois Geological Quadrangle Map, IGQ Metropolis-SG, 1:24,000 (2 sheets).**

The first reference (Nelson and Masters 2008) includes a stratigraphic/structural cross section that intersects the MTW site and was developed using logs from a water well on the site. Accordingly, the NRC considers these references to be definitive unless Honeywell provides valid reasons for using different descriptions. The ER should use geologic nomenclature and descriptions that are consistent with the nomenclature and descriptions in these studies, or the ER should describe discrepancies and justify the terms used in the ER. The following clarifications are needed:

- A. ER Section 3.3.1, p. 3-8, makes no mention of the Metropolis or the Mounds Formations. However, both are clearly identified under the site as significant marker beds by the ISGS Joppa Quadrangle. Clarify the apparent inconsistency of the ER with the ISGS map.
- B. ER Section 3.3.1, p. 3-8, states that the first limestone is the St. Louis Formation. This is inconsistent with the name applied to that unit by the above-referenced ISGS Quadrangles. Clarify the apparent inconsistency of the names for the first limestone.
- C. ER Section 3.3.1, p. 3-9, states that “a sand deposit approximately 35 to 65 feet thick...” is “outwash from a distal valley train of the Mackinaw Member of the Henry Formation.” However, this is inconsistent with the name applied to that unit by the ISGS Quadrangles. The proper designation appears to be the Mounds Formation, which, as opposed to the Quaternary Henry Formation, is actually Tertiary in age sequence. Clarify why the unit is named Mackinaw in the ER as opposed to the Mounds Formation.
- D. ER Section 3.3.1, p. 3-9, suggests that the next unit overlying the aforementioned “sand deposit” is the Carmi Member of the Equality Formation. However, this is inconsistent with the name applied to that unit by the ISGS Quadrangles. The proper designation appears to be the Metropolis Formation. Clarify if this unit should be called the Carmi Member of the Equality Formation or the Metropolis Formation.

- E. ER Section 3.3.1, p. 3-9, indicates the presence of “a 70-foot gray to black lignitic shale or siltstone sequence known as the Levings Member. This formation is unconformably underlain by a limestone of Mississippian age, believed to be the St. Louis limestone.” However, the ISGS Joppa and Metropolis Quadrangle maps and cross sections do not identify a Levings Member; rather, the Post Creek Formation is depicted to separate the McNairy formation from the underlying limestones of Mississippian age. In addition, the references describe the Post Creek Formation as largely gravel as opposed to black lignitic shale.

Moreover, the limestone unit described in ER Section 3.3.1 is widely interpreted to be the Mississippian Salem Limestone. The St. Louis Limestone, which typically conformably overlies the Salem Limestone (Msm), is identified in the ISGS Joppa Quadrangle map (Nelson and Masters 2008) to the west of a north-south oriented fault that itself is to the west of the site. However, the Joppa Quadrangle map does not identify the St. Louis formation in the strata underlying the MTW footprint. The Metropolis Quadrangle map suggests that the St. Louis Formation does not occur immediately to the east of the MTW site. Rather, it only can be observed roughly 2 miles to the north of the city of Metropolis. Clarify whether this unit should be called the St. Louis Limestone or the Salem Limestone.

### **D-RAI – GEO-3**

ER Section 3.4.7, p. 3-19, first paragraph, identifies the Mounds Gravel under the site as the first aquifer. However, the Mounds Gravel is not identified in the geology descriptions in ER Section 3.3. Provide consistent terminology and nomenclature between ER Sections 3.3 and 3.4.

### **D-RAI – SW-1**

ER Section 3.4.1 states that there are four intermittent creeks that drain the MTW site property to the Ohio River. The ER also refers to an “effluent ditch.” The NRC’s 2006 EA refers to a “natural drainage ditch” and “intermittent drainage channel.” Clarify the nature of the four creeks. If these ditches are other features apart from the creeks, indicate them in the figure(s) requested in RAI – PA-1.

### **D-RAI – GW-1**

ER Chapter 4 does not address ground water impacts, although ER Sections 3.4.7 and 3.4.8 contain some relevant information. As part of its environmental review, the NRC needs to determine impacts on ground water use and quality. Therefore, the NRC requests that the following information be provided to determine these impacts:

- A. Verify that the flow rates for Outfall 002, provided in ER Table 2.1-5, reflect ground water consumptive use. If this flow rate does not reflect ground water consumptive use, provide the annual or daily rate of ground water withdrawal needed for the MTW site for a period of 40 years. State whether ground water consumptive use would be proportional to any process output changes that would support the growth multipliers provided in ER Table 3.6-3.
- B. ER Section 3.4.8.3.1 states that portions of the MTW site would have long-term restricted use due to contamination from chlorinated solvents and arsenic from “historic activities.” Describe these historic activities and indicate whether they were related to

past uranium processing at the site or whether they are from previous industrial activities prior to the beginning of uranium processing activities. If the historic activities were related to past uranium processing, describe the activities, what caused the contamination, and the measures taken to stop the activities from causing contamination.

- C. ER Section 3.4.8.3.2 describes an ongoing investigation of possible contamination from underground process sewers and structures. Describe the location of these sewers and structures on the site and their role in the process at the MTW, including the source and type of effluents going into them. Provide an updated status of these investigations and identify the possible contaminants.

#### **D-RAI – AIR-1**

Identify air quality impacts associated with decommissioning the MTW and how they would be mitigated.

#### **D-RAI – SOC-1**

ER Section 3.10.1 states that the MTW site employs 237 people as of February 2016. Provide updated employment levels (e.g., as of February 2017), given that layoffs have recently occurred. Identify about what the maximum employment level would be if MTW was operating at the maximum permitted capacity.

#### **D-RAI – EJ-1**

ER Section 3.10.6.2 and Figure 3.10-3 identify two low-income block groups, but the ER does not include further analysis as no significant impacts are anticipated in general. Because there are block groups that meet the environmental justice criteria, the NRC would like to further identify any mitigation measures that Honeywell might already be performing, or plans to perform, that would be available to persons from within these low-income block groups. This could include scholarships, grants, or other community activities that Honeywell sponsors in the local community.

#### **D-RAI – POH-1**

ER Table 3.11-1 identifies the dose to workers at the MTW. Clarify whether this dose represents only monitored workers or all workers. Identify where in the MTW site radiation doses to workers are most likely to occur.

#### **D-RAI – POH-2**

As stated in ER Section 4.6.4, the use of ammonia (NH<sub>3</sub>) has been discontinued and replaced by liquid hydrogen supplied by a contractor. However, ER Section 2.1.2.1.13 and Table 2.1-1 state that NH<sub>3</sub> is still stored on site, and Table 2.1-3 shows there were emissions of NH<sub>3</sub> in 2014. The ER does not state how ammonia might still be used at MTW, such as in ore preparation. Clarify whether the use of NH<sub>3</sub> was discontinued and whether NH<sub>3</sub> will continue to be stored on site and for what purpose throughout the requested licensing period of 40 years. If ammonia is still being used, described how this chemical is being used in the manufacturing process.

#### **D-RAI – POH-3**

As part of the development of the EA, the NRC will verify the results obtained from the use of CAP-88 to determine public dose. Provide an electronic copy of sample input and output files for determining individual and population doses. The NRC does not need all input and output files for its environmental reviews.

#### **D-RAI – WM-1**

ER Table 3.12-1 identifies radioactive waste generation amounts from 2010 to 2014. In 2010 and 2011, the amount of waste generated was several times greater than the amounts in 2012–2014, with 2013 being particularly low. Identify the reason for the variability in waste generation rates over this time period. Clarify whether the range in these rates over these years would be reflective of future waste generation rates. Identify any potential future MTW projects that might cause a large increase in radioactive waste generation, including over a 40-year license period.

#### **D-RAI – WM-2**

ER Section 3.12.4 notes that the amount of mixed waste generated each year from 2010 to 2014 was “quite variable.” Explain why there is such variability, and whether the range in these mixed waste generation rates would bound, or generally be indicative of, future annual mixed waste generation. Identify any potential future MTW projects that might cause a large increase in mixed waste generation, including over a 40-year license period.

#### **D-RAI – WM-3**

ER Section 3.12.3 gives a range of 13,000 to 27,000 pounds of hazardous waste generated annually from 2010 to 2014. Explain why there is such variability, and whether the range in these hazardous generation rates would bound, or generally be indicative of, future annual hazardous waste generation, including over a 40-year license period.

#### **D-RAI – WM-4**

ER Section 3.12 does not state whether there is a waste minimization plan for the MTW. Identify whether Honeywell has a waste minimization plan for MTW operations (the plan does not need to be provided).

#### **D-RAI – WM-5**

In Revision 1 of the Decommissioning Cost Estimate, dated April 20, 2016, Honeywell assumed that derived concentration guideline levels (DCGLs) would be the same as those developed for Sequoyah Fuels (110 picocuries per gram). Explain why development of DCGLs would be necessary to comply with the 10 CFR 20.1402 release criteria, and why the Sequoyah DCGLs would be a bounding assumption for developing waste estimates for decommissioning. Clarify that Honeywell would develop DCGLs based on site-specific conditions at the MTW.

#### **D-RAI – MIT-1**

In ER Section 5.0, Honeywell provides ‘mitigation measures’ related to the closure of the ponds, and other process-related controls and mechanisms to reduce environmental impacts. Describe any other mitigation measures that are anticipated that would be required by the NRC license or other environmental permitting mechanisms that would be needed to conduct operations for an additional 40 years.