SYNERGY ENVIRONMENTAL, LLC

February 6, 2015

Mr. Scott Green, RG
Manager, Remedial Projects Manager
ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY
1110 West Washington Street
Phoenix, Arizona 85007

Re: **Roosevelt Irrigation District's (RID) Response to Comments from Nucor Corporation and Meritor/Cooper Industries**

Dear Mr. Green:

Synergy Environmental LLC, on behalf of the Roosevelt Irrigation District (RID) and in conjunction with RID legal counsel, has reviewed the Nucor Corporation comments, dated January 14, 2015 and the Meritor and Cooper Industries comments, dated January 13, 2015, which incorporated the Meritor comments, dated December 2, 2014.

At the outset, RID strongly objects, as violative of multiple Arizona laws and WQARF rules as more fully described below and in its January 7, 2015 Response, to the following fundamental position of the Working Group Feasibility Study (WFGS) Report incorporated within the Meritor and Cooper comments: that the commenters are able to indiscriminately and without authority pollute Arizona's drinking water protected use aquifers and water supply wells and have no liability for violating the applicable state water quality standards and no remedial obligation to control, manage or cleanup their contamination, unless and until only certain beneficial uses are made of the contaminated resource. "New WQARF" did not grant an unfettered license to pollute Arizona's aquifers and water supply wells without legal or regulatory consequence if no or only certain beneficial uses were currently being made of the polluted resource. This shameful and unlawful position shared by the commenters is epitomized by the false statement in the Arizona Chamber of Commerce comments, a fellow supporter of the WGFS Report, that the WGFS Report "conclusively demonstrates … that treatments is NOT now needed and can be avoided entirely."[1]

The RID FS Report was submitted for ADEQ approval in order to expeditiously cleanup[2] and address the groundwater contamination[3] that threatens public health, welfare and the

[1] AZ Chamber Comments, page 2.
[2] *See* ADEQ Strategic Plan: FY15 Update to FY2014-FY2018 Plan where a primary goal of ADEQ is to "accelerate clean-ups."
[3] *See* January 2015 Letters from Goodyear and Buckeye to ADEQ regarding support for the "expeditious" cleanup of the groundwater contamination within the West Van Buren Area WQARF Site.

environment and adversely impacts RID water supply wells in the West Van Buren Area (WVBA) Water Quality Assurance Revolving Fund (WQARF) Site.

Contrary to the misinformation contained in these comments, RID has submitted an FS Report to ADEQ that is not only consistent with existing Arizona law and WQARF program rules and policies, but recommends remedial actions that are extremely reasonable, cost-effective and consistent with remedial actions approved by ADEQ and the United States Environmental Protection Agency (EPA) at other similarly contaminated groundwater sites in Arizona. However, RID understands the obvious bias of Meritor, Cooper and Nucor and why there is so much misinformation contained in their comments submitted to ADEQ regarding the RID FS Report. It is an undisputed fact that these entities have documented "releases" of hazardous substances at their facilities that have contaminated groundwater[4] that is being addressed by RID's ADEQ-approved Modified Early Response Action (ERA) and/or will be addressed by the final remedy selected by ADEQ for the WVBA WQARF Site.

Under federal law, these documented "releases" classify the owners and operators of these facilities as "potentially responsible parties" (PRPs) who are subject to joint and several liability for the response costs incurred by RID and ADEQ to address the polluted RID wells for unrestricted beneficial use and protect public health, welfare and the environment.[5] In fact, other PRPs have admitted that "the entities listed [by ADEQ] in the West Van Buren Remedial Investigation Report [which includes Nucor] … and entities that have been historically involved in the Motorola 52nd Street superfund," which include Meritor and Cooper, are PRPs for the groundwater contamination in the WVBA WQARF Site.[6] Not surprisingly, the blatant disregard and misrepresentations of the RID FS Report, applicable state laws and WQARF rules, and ADEQ' s remedial objectives for the WVBA WQARF Site are simply shameful efforts to avoid and minimize their legal obligations to address and remediate the contamination impacting the WVBA aquifer and RID' s water supply wells.

Although RID previously has addressed many of the same issues raised in the Nucor, Meritor and Cooper comments in RID's previous responses, including its recent response, dated January 7, 2015, and in prior RID correspondence and communications during the more than five years of significant community involvement activities[7] that occurred prior

[4] The City of Phoenix has acknowledged that the WVBA and Motorola 52nd Street co-mingled plume "is the result of historical spills and other releases of commercial and industrial solvents from facilities throughout the area, which reached the groundwater and caused contamination." City of Phoenix, 2011 Water Resource Plan, page 22 (2011). As discussed below, ADEQ has identified facilities hydraulically upgradient of the WVBA WQARF Site that have also contributed contamination to the WVBA aquifer that is impacting or threatening to impact RID's water supply wells within the WVBA WQARF Site.

[5] 42 U.S.C. § 9607(a); *Carson Harbor Vill., Ltd. v. Unocal Corp.*, 270 F.3d 863, 870-71 (9th Cir. 2001) (en banc)

[6] *See* Appendix F, Working Group Feasibility Study (WGFS) Report (July 15, 2014).

[7] *See* http://www.azdeq.gov/environ/waste/sps/wvb.html (ADEQ website containing RID's prior work plans, ADEQ's approvals of such work plans and RID's responses to all PRP comments throughout the last five years

to ADEQ's approval of RID's ERA and Modified ERA pursuant to AAC R18-16-413, RID is compelled to provide this response in order, once again, to correct the administrative record, to advocate for the protection of public health and the environment as required by Arizona law, and to avoid civil and criminal violations of applicable water quality standards as proposed by the Working Group Feasibility Study (WGFS) Report. RID also is compelled once again to highlight the applicable Arizona laws and WQARF rules and policies which have been completely disregarded by the Nucor, Meritor and Cooper comments. Instead of responding to every misrepresentation or inaccuracy in their comments, RID is addressing the substantive issues that are relevant to RID's written request for approval, pursuant to AAC R18-16-413, for the RID FS Report.

Although not applicable to an FS Report, ADEQ has determined that the West Osborn Complex WQARF Site is contributing to the WVBA WQARF Site

Consistent with state law, RID's FS Report is not concerned with identifying any facility's potential liability, but is simply proposing remedial alternatives capable of meeting all of the remedial objectives established by ADEQ for the WVBA WQARF Site.[8] However, in ADEQ's Final Remedial Investigation Report for the WVBA WQARF Site, ADEQ clearly stated that the "West Osborn Complex (WOC) site is the southernmost of five plumes in the [West Central Phoenix (WCP)] Site and is closest to the WVBA" and that the WCP WQARF Site is "north of the central portion of the WVBA and hydraulically upgradient."[9] In that report, ADEQ noted that "[t]hree facilities have been identified as likely sources of groundwater contamination in the WOC: United Industrial … Corning Inc./Components Incorporated … [and] Nucor Corporation."[10] ADEQ clearly determined that groundwater contamination including "TCE and other VOCs appear to be entering the central portion of the WVBA from the north."[11]

RID's groundwater modeling sufficiently predicts the regional cleanup of groundwater contamination

The groundwater flow model in the RID FS Report is an updated version of the Central Phoenix Plume Model (CPPM) that was originally developed for the WVBA WQARF Site by an expert modeling technical contractor working for ADEQ. As part of the lengthy Remedial Investigation activities conducted by ADEQ, Terranext reviewed the CPPM conceptual model, model construction, calibration and validation and concluded that the

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addressing many of the same issues raised by Nucor, Meritor and Cooper, but which never persuaded ADEQ to not approve the RID voluntary requests that comply with all applicable statutory and regulatory requirements).

[8] AAC R18-16-407.E.1.

[9] ADEQ Final Remedial Investigations Report, page 4-12 (2012).

[10] *Ibid.* at page 4-13.

[11] *Ibid.* at page 4-12.

CPPM "meets its intended purpose to evaluate remedial alternatives and contaminant movement".[12] Montgomery & Associates (M&A), on behalf of RID, updated and recalibrated the CPPM in accordance with an ADEQ-approved work plan for the purpose of conducting a comparative assessment of the projected hydrologic impacts associated with FS remedial alternatives. This was a limited scope objective, and M&A was clear to indicate the change in pumping associated with any remedial alternative is very minor in comparison to the large-scale RID pumping that occurs within the WVBA Site. As a consequence, the projected hydrologic effects from the remedial alternatives would be difficult to discern on the scale of the modeling conducted. Indeed, model projections developed for each remedial alternative indicate the implementation of the proposed alternative groundwater remedies would not significantly alter future hydrologic or plume conditions in the WVBA Site.

Meritor and Cooper criticized the RID FS Model because it failed to incorporate the indentified downward trend of VOC concentrations in the underlying aquifer and argued that the RID FS Model would therefore be unable to reliably "project any future benefits for any of the identified Remedial Alternatives." This is a baseless criticism. Neither RID nor the Working Group developed a solute transport model to conduct the type of analysis that Meritor and Cooper seem to indicate is needed. Indeed, the data and detailed understanding of contaminant sources, fate, and transport are lacking to develop a reliable, calibrated transport model for the WVBA Site. Further, this issue is largely moot given that the modeling exercise was intended as a comparative evaluation of overall limited changes in the area-wide pumping regime.

Nucor criticized the RID FS Model for including inappropriate monitor input parameters in the region of the WOC Site that are said to preclude the use of the model for: (1) indentifying potential sources of groundwater contamination within the West Central Phoenix (WCP) WQARF Site,[13] and (2) accurately predicting the effect RID's recommended remedy would have on contamination migrating from WCP. RID's FS Model is not concerned with identifying any facility's potential liability for area-wide groundwater contamination. The purpose of the model, as already stated, was to comparatively analyze the projected hydrologic impacts associated with proposed FS remedial alternatives. In

[12] Final Remedial Investigation Report, West Van Buren Area WQARF Registry Site, Phoenix, Arizona, prepared by Terranext, August 2012, pages 5-7 to 5-10.

[13] Although Nucor criticizes RID's failure to use appropriate model input parameters that can reasonably predict groundwater flow at or near the WOC, it should be pointed out that groundwater flow simulations from the RID FS Model are consistent with the projected pattern of groundwater movement derived in the groundwater modeling that was conducted by GeoTrans to evaluate remedial alternatives in the January 2012 Final Feasibility Study Report for the Shallow Groundwater System of the West Osborn Complex WQARF Site. Both groundwater models depict shallow groundwater migration from the relatively large region of groundwater contamination south of the WOC Facility to the WVBA WQARF Site.

this regard, the use of groundwater flow modeling to compare the hydrologic effects from the slightly different proposed pumping regimes has little significance in a regional-scale model. Consequently, as indicated in RID's FS Report, the model does not show any substantial change in regional groundwater flow, including groundwater flow and advective movement of groundwater contaminants from the WCP, for any of the alternative groundwater remedies, compared to model simulations of RID's historical baseline of groundwater pumping.

In sum, there is no valid basis to criticize RID's development and use of the groundwater model applied to the FS given that the modeling exercise was intended as a comparative evaluation of overall limited changes in the area-wide pumping regime and the model projections confirm the proposed alternative groundwater remedies would not significantly alter future hydrologic or plume conditions in the WVBA WQARF Site.

WQARF remedial actions are not limited solely to address current risks to public health

As noted in more detail in RID's January 7, 2015 Response, the PRPs legally responsible for the groundwater contamination would have ADEQ and the public falsely believe that WQARF's statutory requirement that "remedial actions shall … assure the protection of public health and welfare and the environment"[14] is limited only to "public health" standards and does not include the "environmental" standards established by Arizona law. Uncertainty as to the magnitude of current risk to public health has not stopped ADEQ and EPA from addressing the groundwater contamination to meet applicable environmental laws and providing measures to limit exposure of hazardous substances to the surrounding community.[15]

RID has further explained that in accordance with state law, ADEQ has developed water quality standards necessary for the "protection of the public health and the environment."[16] In addition to the enforceable numeric drinking water aquifer water quality standards established by state law,[17] there are equally enforceable narrative aquifer water quality standards that prohibit "a pollutant to be present in an aquifer for a drinking water protected use in a concentration which endangers human health" or "be present in an aquifer which impairs existing or reasonably foreseeable uses of water in an aquifer."[18] Violation of any applicable water quality standard is a serious offense. Under Arizona law,

[14] ARS § 49-282.06.A.1.
[15] *See* RID's Comments, dated January 7, 2015 for detailed discussion of ADEQ and EPA policies and actions even if no significant risk to public health is present.
[16] ARS § 49-221.C. These MCL standards were adopted by rule as the numeric aquifer water quality standards for aquifers classified for drinking water protected use in AAC R18-11-406.
[17] ARS §49-223.A; AAC R18-11-406.
[18] AAC R18-11-405.

in addition to being violations of the WQARF mandatory remedial action criteria of ARS § 49-282.06.A.1 and A.2, it is a civil and criminal offense to violate any applicable water quality standard.[19]

The aquifer underlying the WVBA WQARF Site, like "[a]ll aquifers in this state" is "classified for drinking water protected use." According to ADEQ's WVBA Regional Groundwater Monitoring Annual 2013-2014 Report,[20] TCE, a known human carcinogen, is present in the WVBA aquifer in concentrations up to 50x the applicable *numeric* aquifer water quality standard. Accordingly, the TCE concentrations in the WVBA aquifer also clearly violate the applicable *narrative* aquifer water quality standards for being "present in an aquifer for a drinking water protected use in a concentration which endangers human health" and for being "present in an aquifer which impairs … reasonably foreseeable uses of water in an aquifer." ADEQ, COP, SRP and RID have all agreed that the "reasonably foreseeable uses" of the WVBA aquifer is for a drinking water use.[21]

Fortunately for the local community, state law prohibits ADEQ from approving an FS report that does not "compl[y] with A.R.S. § 49-282.06"[22] which identifies mandatory remedial action criteria, including the requirement to "assure the protection of … the environment" by assuring compliance with the applicable aquifer water quality standards as required by applicable Arizona law.

ADEQ's conditions for the ADEQ-approved Early Response Action have been superseded

RID's ADEQ-approved Early Response Action (ERA) and Modified ERA are not at issue with RID's FS Report. Despite providing comments about the tasks included in ADEQ's approval of RID's ERA, Meritor acknowledges in its own comments that the tasks are no longer applicable since "[b]y letter dated February 1, 2013, ADEQ issued a new Administrative Determination … [and] [t]his approval **supersedes** the ADEQ approval of the previous ERA Work Plan dated February 3, 2010."

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[19] ARS § 49-262.C. Civil offenses are punishable by a fine up to $25,000 per day per violation. ARS § 49-263.A.4. According to ARS § 49-263.C, a "person who knowingly performs an act prohibited under subsection A of this section is guilty of a class 5 felony," while a "person who knowingly or recklessly manifests an extreme indifference for human life in performing an act prohibited under subsection A of this section is guilty of a class 2 felony" under ARS § 49-263.D. The term "person" has the broad meaning defined in ARS § 13-105.

[20] Regardless if the recent reports identify a declining trend, Arizona's applicable numeric and narrative water quality standards are still required to be achieved.

[21] *See* ADEQ, Final Remedial Objectives Report, pages 3-2 and 3-3 (August 8, 2012); WGFS Report, pages 12-13 (2014). "Reasonably foreseeable uses of water are those likely to occur within 100 years unless a longer time period is shown to be reasonable based on site-specific circumstances." AAC R18-16-406.D.

[22] *See* AAC R18-16-413.F; AAC R18-16-407.J; AAC R18-16-407.A and AAC R18-16-407.E.1.

RID's implementation of the Modified ERA must comply with ADEQ's approval

It is strange that RID is being criticized by Meritor for not properly operating the wellhead treatment systems when RID was simply complying with ADEQ's approval conditions[23] and complying with a request raised by Meritor's legal counsel. Pursuant to ADEQ's February 1, 2013 approval of RID's Modified ERA, ADEQ required that "RID must maintain historical pumping rates to ensure that there are no adverse impacts." RID's pumping rates at the wells with wellhead treatments are determined by customer demand and RID's voluntary efforts to minimize pumping from the highly contaminated wells. Therefore, these wells have historically only pumped during the high demand season between March and October which is consistent with Meritor's graph. Furthermore, in 2014, the wellhead treatment systems were placed in bypass mode at the end of May in agreement with ADEQ in order to allow the public to review and comment on RID's Operation and Maintenance Plan for the wellhead treatment systems that had been previously submitted to ADEQ by RID. Meritor's legal counsel requested that this public process occur so it is unclear why Meritor would criticize RID for complying with Meritor's request.

RID has not overstated the removal capacity of contamination in the MERA

Simply based on a comparison between Table 2 of RID's Modified ERA and Tables 4 and 5 of the *"RID Phase 1 Wellhead Treatment System Annual VOC Mass Removal Evaluation"*, dated October 31, 2014 and prepared by Arcadis for Meritor, the assertion that RID overstated the treatment capacity is incorrect. Table 2 of RID's Modified ERA indicates that the Phase 1 Wellhead Treatment Systems have a combined pumping rate (or treatment capacity) of 8,600 gpm. However, Tables 4 and 5 of the Arcadis report includes an "Actual Maximum" combined flow rate for the Phase 1 wells of 8,964 gpm. Obviously, based on these data, RID did not overstate the treatment capacity of the Phase 1 wells.

Meritor's issue regarding RID's estimate to ADEQ of 1,900 pounds per year for the total annual VOC mass removal by the MERA Phase 1 Wellhead Treatment is another in a long line of inaccurate messages conveyed by the PRPs to ADEQ. Table 2 of the MERA does in fact estimate the total annual VOC mass removal by the MERA Phase 1 Wellhead Treatment Systems (RID-89, RID-92, RID-95 and RID-114) as approximately 1,900 pounds. However, the Arcadis report (and Meritor) fails to identify footnote 4 on Table 2, which indicates, "Mass removal assumes *100% duty* for Phase 1 and Phase 2 wells." Therefore, the 1,900 pounds mass removal estimate assumes that the wells would be operated continuously. Arcadis argues that the 1,900 pounds is an overestimate, but actually, their *"Potential*

[23] Meritor spent nearly 10 pages criticizing RID for not complying with ADEQ's conditions even though those tasks had been superseded and no longer were applicable.

Maximum Annual Target VOC Mass Removal" (Table 4 of the Arcadis report) for the same Modified ERA Phase 1 wells was 2,182 pounds, assuming:[24]

- *"Maximum flow rate, continuously 365 days per year;*
- *Sustained target VOC concentrations, represented by the maximum of each target VOC exceeding the respective USEPA MCL observed at each respective location between 2012 and 2014; and*
- *100 percent mass removal efficiency (VOCs reduced to concentrations below the detection limit)."*

Consequently, RID's estimate was approximately 15% more conservative than the mass removal estimate calculated by Arcadis.

RID's Recommended Remedial Alternative is the most cost-effective proposal that meets all applicable laws

The PRPs continue to misstate the issue of cost effectiveness of the RID Proposed Remedial Alternative by misrepresenting the facts with respect to the "removal" of contaminant mass. To clarify the facts regarding this relative comparison of cost (and effectiveness), comparing RID's and the Working Group's Proposed Remedial Alternatives, consider the following:

The Working Group's Proposed Remedial Alternative is predicted to remove approximately 74 pounds of VOCs per year from extraction well EW-2 pumping at 500 gallons per minute (gpm). Contaminated groundwater would be treated through liquid-phase granular activated carbon (LGAC). The Working Group proposes to provide no treatment to any of the impacted RID wells. The Working Group estimates the capital cost for the new 500-gpm extraction well and treatment system to be $2,454,095 and the annual O&M cost at $524,445.[25]

The RID Proposed Remedial Alternative is projected to remove and treat approximately 2,500 pounds of VOCs per year from six impacted RID water supply wells equipped with wellhead treatment systems (RID-89, -92, -95, -106, -109, and -114). The treatment systems consist of 14 skids of LGAC in lead/lag mode capable of treating 14,000 gpm (at a nominal rate of 1,000-gpm per skid). RID estimates the capital cost for the installed treatment capacity to be $9,445,000[26] and the annual O&M costs at $1,690,500.[27]

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[24] Arcadis Report, page 7/12.
[25] Based on Module E Cost Detail in Appendix E of the WGFS Report.
[26] From Table 7 of the RID Draft FS Report, the true capital cost of the wellhead treatment systems is an estimated $7.5 million as shown in the first 6 lines of the spreadsheet developed for the Less Aggressive Remedy in this table. For the purposes of this cost comparison, RID will use the total cost for all capital improvements.

Given these facts, the math is straightforward:

Working Group Proposed Remedial Alternative:

Capital Cost/gallon of installed treatment capacity …… **$4,908/gallon**
Annual O&M Cost/pound of VOC removal …… **$7,087/pound**

RID Proposed Remedial Alternative:

Capital Cost/gallon of installed treatment capacity …… **$675/gallon**
Annual O&M Cost/pound of VOC removal …… **$676/pound**

The RID Proposed Remedial Alternative is **substantially** more cost effective in terms of capital and annual O&M costs than the Working Group's Proposed Remedial Alternative, by any measure.

The WGFS Report deceptively includes VOC mass that is removed by pumping and treatment at the four RID wells currently equipped with wellhead treatment systems as part of the Modified ERA in their estimates of remedial action cost effectiveness. This is totally disingenuous since the Working Group explicitly stated that they consider the RID wellhead treatment systems unnecessary at the December 2014 meeting of the WVBA Community Advisory Board. Certainly, the costs of the RID treatment systems are not included in the capital and O&M cost estimates contained in the WGFS Report. Consequently, the Working Group's calculations of their groundwater "remedy" cost effectiveness include VOC mass removed by RID extraction wells despite the fact that this VOC mass is not "removed from the environment," despite the fact that these VOCs would be released into the local neighborhoods under their proposed plan, and despite the fact that their Proposed Remedial Alternative is not really effective in removing the contaminants from the local environment.

RID appreciates ADEQ consideration of the comments provided in this letter. Please give me a call with any questions or comments.

Best Regards,

SYNERGY Environmental, LLC

Dennis H. Shirley, PG

[27] From Table 7 of the RID Draft FS Report, the annual O&M cost excludes an estimated $134,000 annual cost for groundwater monitoring and an estimated $225,000 annual charge for major equipment repair or replacement.

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