

Danielle R. Taber

From: Dennis H. Shirley <dennis.shirley@syn-env.com>
Sent: Wednesday, January 07, 2015 5:33 PM
To: Scott R. Green; Danielle R. Taber
Cc: Tina LePage; Laura L. Malone; Donovan L Neese; David Kimball; Sheryl Sweeney; Joel Peterson
Subject: RID Comments on WVBA WQARF Site Feasibility Study Reports
Attachments: _RID_Comments_on_WGFS_Report.010715.pdf;
_Response_to_Comments_on_RID_FS_Report.010715..pdf

Dear Scott and Danielle,

Attached please find PDF copies of two documents submitted on behalf of Roosevelt Irrigation District and their legal counsel pertaining to:

1. RID Comments on the Working Group's Draft Feasibility Study Report, and
2. RID Response to Working Group Comments Dated November 6, 2014 on RID's Draft Feasibility Study Report

As always, RID is available to meet with ADEQ to brief you on these comments or answer any questions you may have regarding these submittals.

Thank you for your consideration,

Dennis H. Shirley, PG

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January 7, 2015

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

Re: **Roosevelt Irrigation District Comments on
Working Group Draft Feasibility Study Report
West Van Buren WQARF Site, Phoenix, Arizona**

Dear Mr. Green,

Synergy Environmental LLC, on behalf of Roosevelt Irrigation District (RID) and in conjunction with RID legal counsel, is providing the following comments on the West Van Buren WQARF Site Working Group's (Working Group) July 2014 draft Feasibility Study (WGFS) Report. As the sole water provider whose wells and water supply have been contaminated and unlawfully restricted, RID is compelled to respond and identify in the WGFS Report some of its more egregious inaccuracies, inconsistencies and failures to meet the applicable requirements necessary for the Arizona Department of Environmental Quality's (ADEQ's) approval pursuant to Ariz. Admin. Code (AAC) R18-16-407 and R18-16-413 and to avoid criminal violation of applicable water quality standards.

First and foremost, RID finds the WGFS Report critically flawed and lacking credibility. The WGFS Report does not address the needs of RID in the West Van Buren Area (WVBA) nor does it achieve all of the Remedial Objectives established by ADEQ for the WVBA Water Quality Assurance Revolving Fund (WQARF) Site. The proposed groundwater remedy offered in the WGFS Report proposes a token and, quite frankly, ineffectual approach to protecting and restoring groundwater resources. There is no practical value or benefit in the Working Group's proposed groundwater remedy. In fact, the proposed groundwater remedy is a major step backwards from the remedial actions approved by ADEQ pursuant to RID's Modified Early Response Action (ERA) because the Working Group insists that ADEQ remove protections already in place in the WVBA WQARF Site and provide considerably less public health and environmental protection than required at other similar state and federal groundwater cleanups in Arizona.

RID understands the obvious bias of the Working Group and why there is so much misinformation contained in the WGFS Report submitted to ADEQ, given that the



members of the Working Group have documented “releases” of hazardous substances at their facilities¹ that have contaminated groundwater² that needs to be addressed by an ADEQ-approved final remedy for the WVBA Water Quality Assurance Revolving Fund (WQARF) Site. A fact sheet summarizing the WVBA WQARF Site is provided in **Attachment 1**. 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 to address the groundwater contamination and protect public health, welfare and the environment.³ In fact, the Working Group has acknowledged that “the entities listed [by ADEQ] in the West Van Buren Remedial Investigation Report ... and entities that have been historically involved in the Motorola 52nd Street Superfund Site” are PRPs for the groundwater contamination in the WVBA WQARF Site.⁴

Despite all of the numerous inaccuracies and inconsistencies, in an attempt to be clear and concise, RID will elaborate its fundamental concerns and criticisms of the WGFS Report in the briefest terms possible in this cover letter and will expound on the major points in detail in the accompanying attachments.

1. The WGFS Report proposes remedial alternatives that unjustifiably and unlawfully provide less public health and environmental protection than required at the WVBA WQARF Site and other similar state and federal groundwater cleanups in Arizona.

The WGFS Report is unacceptable because each proposed remedial alternative fails to include measures that will “[a]ssure the protection of public health and welfare and the environment” as required by Arizona law⁵ and that are

¹ The Working Group acknowledges that it “is an unincorporated association of parties that either had or have operating facilities within the [WVBA].” Working Group FS Report, 1 (November 2014). Members of the Working Group include: Air Liquide America Specialty Gases, LP; Arizona Public Service (APS); the City of Phoenix (COP); Dolphin, Incorporated; Freescale Semiconductor, Inc.; Holsum Bakery, Inc.; Honeywell International Inc.; ITT Corporation; Laundry & Cleaners Supply, Inc.; Maricopa Land and Cattle Co.; Milum Textile Services Co.; Prudential Overall Supply, Inc.; Salt River Project Agricultural Improvement and Power District (SRP); Schuff Steel Company; and Univar USA. – formerly Van Waters & Rogers. Penn Racket Sports (HTM Sport GmbH/HEAD USA/HEAD Penn Racquet Sports) participated in the early stages of the Working Group.

² 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).

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

⁴ See WGFS Report, Appendix F, Fn. 1 (July 15, 2014).

⁵ ARS § 49-282.06.A.1.



foundational at all of the other similar state and federal groundwater contaminant sites. Failure to provide for the reduction and control of releases of hazardous substances into the ambient air of the local community and in the local groundwater would disproportionately affect the minority community in the WVBA WQARF Site. Such remedial action is foundational at all of the other Arizona WQARF and CERCLA sites where the transfer of hazardous volatile organic compound (VOC) contaminants from the groundwater to ambient air is prohibited and where such contaminants must be removed from the environment and disposed of properly in order to ensure a high degree of public protection.

Despite ADEQ's recent requirement that measures be implemented to limit the "significant volatilization and transfer of contaminants, from water into the air, [that] is occurring and ongoing" within the WVBA WQARF Site because "long-term [health] effects are uncertain,"⁶ the WGFS proposed remedial alternatives do not implement any such measures to protect the WVBA WQARF Site community. In fact, although it is unclear in the WGFS Report, the Working Group confirmed at the December 1, 2014 Community Advisory Board (CAB) meeting that their proposed groundwater remedy would request that ADEQ, as part of the Record of Decision, require the cessation of the measures currently in place pursuant to RID's ADEQ-approved Modified Early Response Action (ERA). Therefore, the WGFS proposed remedy would result in the pumping and treatment of only 74 pounds of VOC contaminants annually in place of the approximately 1,900 pounds of contaminants⁷ that can be removed per year by the four existing RID wellhead treatment systems. The Working Group's proposed shutdown of existing public health protection measures that are required at other similar groundwater cleanup sites⁸ is a significant step

⁶ ADEQ, Approval of RID's Modified Early Response Action (ERA) (February 1, 2013).

⁷ As reported in RID's Modified ERA Work Plan (Table 2) for Phase 1 wells (i.e., RID-89, RID-92, RID-95 and RID-114) included as part of the Pilot Wellhead Treatment Systems Initiative, assuming 100% duty (continuous) operation. In its October 31, 2014 Technical Memorandum - *RID Phase 1 Wellhead Treatment System Annual VOC Mass Removal Evaluation* to Jerry D. Worsham II, Esq., Arcadis calculated the potential maximum annual target VOC mass removal (Table 4) for the same wells as approximately 2,200 pounds, for 100% continuous operation.

⁸ ADEQ and EPA have policies that prohibit "the relocation of contaminants from one media (groundwater) to another (air)." Letter from Amanda Stone of ADEQ to Keith Takata of EPA (November 14, 2007). See also "A remedy that achieves an acceptable risk level in one medium may not be preferred if it only achieves this level by transferring contaminants to another medium." *Guidance on Remedial Actions*, 4-9. "Regions should ensure that cleanup levels established to restore groundwater to beneficial use, consistent with the NCP (e.g., restoration to MCLs for current or potential drinking water aquifers), also adequately address other routes of exposure associated with the groundwater, including groundwater as a source of contamination to other media." *Summary of Key Existing EPA CERCLA Policies for Groundwater Restoration*, 9 (June 26, 2009).



backwards in ensuring a high degree of public protection and violates current ADEQ and EPA requirements and policies.

The WGFS Report disregards existing ADEQ and EPA policies and actions considered necessary at other similar groundwater contamination sites in the greater Phoenix area to restrict the uncontrolled releases of hazardous VOCs to air and to address the concerns of the public.⁹ It is unreasonable and RID believes unlawful for the Working Group to suggest, particularly in order to avoid the “*costly long-term O&M of treatment systems*”¹⁰ as potentially responsible parties, that it is somehow acceptable for ADEQ and the public to allow the uncontrolled release and transfer of hazardous chemicals from contaminated groundwater into the air of surrounding communities.

Equally significant is the failure of the WGFS proposed remedial alternatives to protect the “environment” as required by Arizona law. The Working Group would have ADEQ and the public believe that the WQARF Program’s statutory requirement that “remedial actions shall ... assure the protection of public health and welfare and the environment” is limited only to “public health” standards and does not include the “environmental” standards established by Arizona law. Pursuant to Ariz. Rev. Stat. (ARS) § 49-221.A, the ADEQ “*director shall adopt by rule, water quality standards for all navigable waters and for all waters in all aquifers to preserve and protect the quality of those waters for all present and reasonably foreseeable future uses.*” (emphasis added.) Furthermore, ARS § 49-221.C states that in “setting standards pursuant to subsection A ... of this section, the director shall consider ... the protection of the public health and the environment.” Additionally, ARS 49-221.D requires that the “[w]ater quality standards shall be expressed in terms of the uses to be protected and, if adequate information exists to do so, numerical limitations or parameters, in addition to any narrative standards which the director may deem appropriate.”

In accordance with these statutory mandates, ADEQ has developed water quality standards necessary for the “protection of the public health and the environment” and “to preserve and protect the quality of those waters for all present and reasonably foreseeable future uses.” Pursuant to ARS § 49-224.B, “[a]ll aquifers in this state ... shall be classified for drinking water protected use.”

⁹ At the recent December 1, 2014 CAB meeting for the WVBA WQARF Site, a CAB member raised concerns about the cessation of existing ADEQ-approved measures that prevent the uncontrolled release and transfer of thousands of pounds of hazardous chemicals into the air annually. Similarly, at the recent CAB meeting, a member of the public characterized the WGFS proposals as a “civil rights” and “environmental injustice” issue due to the disparate public health protection offered the WVBA community compared with other Arizona communities affected by similar groundwater contamination.

¹⁰ WGFS Report, 37 (2014).

Accordingly and pursuant to ARS § 49-223.A, the “[p]rimary drinking water maximum contaminant levels [MCLs] established by [EPA] ... are adopted as drinking water aquifer water quality standards.”¹¹ In addition to the enforceable numeric drinking water aquifer water quality standards established by ARS §49-223.A, 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.”¹² Under Arizona law, in addition to being a violation of the WQARF mandatory remedial action criteria of ARS § 49-282.06.A.1 and A.2, it is a criminal act to violate any applicable water quality standard.¹³

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, TCE, a known human carcinogen, is present in the WVBA aquifer in concentrations up to 50x the MCL numeric aquifer water quality standard. Accordingly, the TCE concentrations in the WVBA aquifer also violate the 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.¹⁴

Unlike RID’s FS Report that will “assure the protection of ... the environment,” as established by Arizona’s aquifer water quality environmental standards (both numeric and narrative), the WGFS Report fails to meet the applicable aquifer water quality environmental standards. Despite falsely claiming that “[c]ontaminant concentrations are relatively low,” the WGFS Report acknowledges that upon completion of the Working Group’s proposed remedial actions in 2026, TCE will remain present in the WVBA aquifer in concentrations

¹¹ 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.

¹² AAC R18-11-405.

¹³ 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.

¹⁴ See ADEQ, Final Remedial Objectives Report, 3-2,3-3 (August 8, 2012); WGFS Report, 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.

up to 9x¹⁵ the MCL numeric aquifer water quality standard and in clear violation of the applicable narrative aquifer water quality standards,¹⁶ particularly since EPA has recently lowered the carcinogenic value previously used as screening levels for TCE.¹⁷ The Working Group apparently expects ADEQ in 2026 to knowingly allow the contamination to remain in the aquifer in violation of the applicable aquifer water quality standards, something ADEQ is not legally authorized to do as it would constitute a criminal violation of applicable water quality standards.¹⁸

In fact, the Working Group has knowingly insisted to ADEQ that “all WQARF remedies need not require restoration of all aquifers to drinking water standards, without regard to actual and foreseeable uses of the impacted aquifer.”¹⁹ However, the Working Group fails to disclose that ADEQ, pursuant to ARS § 49-282.06.D, only “may approve a remedial action that may result in water quality exceeding water quality standards *after the completion of the remedy* if the director finds that the remedial action meets the requirements of this section.” (emphasis added.) The Working Group is asking ADEQ to unlawfully approve an initial remedy now with the knowledge that, if implemented, the remedy will not meet the applicable water quality standards or remedial objectives for the WVBA WQARF Site. Fortunately for the local community, state law prohibits²⁰ ADEQ from approving a FS that does not “compl[y] with A.R.S. § 49-282.06” or that is not “capable of achieving *all* of the remedial objectives.”²¹

¹⁵ See Figure A-29 in WGFS Report. However, there was no Figure in the WGFS Report that estimated the TCE concentrations in the UAU2 groundwater in 2026, so the TCE concentrations that will remain in the aquifer after the Working Group’s remediation is completed in 2026 are likely to be up to more than 9x the MCL numeric aquifer water quality standards and certainly in violation of the applicable narrative aquifer water quality standards. It is telling that the Working Group has to identify “monitoring wells located off the main axis of the plume [to] exhibit declining VOC concentration trends” in the UAU2 because Figure A-27 acknowledged that TCE concentrations in UAU2 were increasing. WGFS Report, 20. This increase was proven correct by ADEQ’s Annual Water Report. Concentrations of TCE at two UAU2 monitor wells increased to 252 and 227 ug/L during the third quarter of 2013 compared to the first quarter of 2013 concentrations of 177 and 168 ug/L, respectively.

¹⁶ Figures A-28 and A-29 in WGFS.

¹⁷ See fn. 29 of RID’s FS Report; see also WGFS Report, 29 (rejecting potential reinjection because “[i]f the reinjection well(s) are along the downgradient extent of the plume, there is the possibility of forming a new downgradient plume. This circumstance could occur if an MCL is significantly reduced and the MCL concentration has not been met in the treatment system effluent during historical operations.”)

¹⁸ See ARS § 49-263.A.4. Not only does ADEQ constitute a “person” subject to a potential class 5 or class 2 felony, but so would the Working Group members and consultant.

¹⁹ Letter to ADEQ from Working Group (December 1, 2014).

²⁰ It could be argued that the Working Group’s proposed remedial alternatives that fail to meet both the public health and environmental standards applicable for a known human carcinogen at other similar cleanup sites is manifesting “an extreme indifference for human life” subject to a class 2 felony.

²¹ See AAC R18-16-413.J; AAC R18-413.F; AAC R18-16-407.A and AAC R18-16-407.E.1. (emphasis added).



More discussion regarding these neglected state law requirements that the Working Group failed to address is provided in **Attachment 2** of this letter.

2. The WGFS Report fails to comply with critical FS legal requirements necessary for ADEQ's approval

ADEQ is required, as a matter of Arizona law, “to select a remedy that complies with A.R.S. § 49-282.06” and that “shall be capable of achieving *all* of the remedial objectives” for the WVBA WQARF Site.²² The Working Group has failed to develop any proposed remedial alternatives in the WGFS Report that comply with these mandatory WQARF remedial action requirements. Likewise, the WGFS proposed remedial alternatives fail to achieve the mandatory criteria for a sufficient groundwater contaminant cleanup under the federal Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) program. The CERCLA requirements are referenced because, pursuant to state law, ADEQ is required “in selecting remedial actions” to consider the “availability of other appropriate federal or state remedial action.” RID’s legal counsel previously submitted in electronic mail correspondence, dated September 30, 2014, a detailed tabulation of the specific WQARF and CERCLA requirements that must be addressed in any FS, along with comparative analysis of how these requirements were not met in the WGFS Report.

As evidenced in these tables, included as **Attachments 3 and 4** to this letter, all proposed remedial alternatives in the WGFS Report fail to comply with the required elements necessary for ADEQ’s approval. In fact, state law prohibits any WGFS proposed remedial alternative from being adopted because “it is unlawful to ... violate a water quality standard” and a “person who knowingly [violates a water quality standard] is guilty of a class 5 felony.”²³ Given that one of the contaminants of concern in the WVBA WQARF Site is a known human carcinogen (TCE), it could be argued that efforts to knowingly violate the applicable TCE aquifer water quality standards by not taking appropriate remedial action to cleanup TCE in the WVBA aquifer in order (i) “to assure the protection of public health and welfare and the environment” and (ii) “to allow the maximum beneficial use of the [ground]waters of the state” as required by ARS § 49-282.06.A.1 and A.2 or (iii) to comply with the drinking water protected use standards for all aquifers in the State of Arizona in order (iv) “to preserve and protect the quality of those [ground]waters for all present and reasonably foreseeable future uses” pursuant to ARS s 49-224.B and § 49-221.A,

²² See AAC R18-16-407.J; R18-16-407.A; R18-16-407.E.1. (emphasis added).

²³ ARS § 49-263.A.4 and C.

respectively, would constitute “an extreme indifference for human life” subject to “a class 2 felony.”²⁴

The Working Group falsely argues that the “goal of a WQARF remedy is to provide for reasonably foreseeable uses, not to remove contaminant mass simply for the sake of removing contaminant mass.”²⁵ As with many of the Working Group’s arguments, there is no legal support provided for such a statement. In fact, such a position is contrary to ARS § 49-282.06.A.2 that mandates that remedial actions shall “provide for the control, management or cleanup of the hazardous substances in order to allow the maximum beneficial use of the waters of the state,” including all aquifers in the state that are classified for drinking water protected use.²⁶ Allowing the known human carcinogen, TCE, to remain in the aquifer above the current aquifer water quality standards would fail to meet the mandatory remedial action criterion in ARS § 49-282.06.A.1 that all remedial actions “assure the protection of public health and welfare and the environment,” would fail to meet the mandatory remedial action criterion in ARS § 49-282.06.A.2 that all remedial actions “to the extent practicable, provide for the control, management or cleanup of the hazardous substances,” would violate the standard in ARS § 49-221.A “to preserve and protect the quality of ... [all aquifers] for all present and reasonably foreseeable future uses,” and constitute a criminal violation of state law.²⁷ Likewise, there are a number of groundwater contaminant sites in Arizona where extracted water is treated to meet drinking water standards despite the end use being irrigation,²⁸ particularly if the applicable WQARF remedial objectives require, as they do in the WVBA WQARF Site, treatment to “protect, restore, replace or otherwise provide a water supply ... for current *and reasonably foreseeable uses*” by controlling, managing or cleaning up the hazardous substances. (emphasis added.) In fact, SRP requires that remediated water be treated to the applicable drinking water standard before entering SRP’s irrigation distribution system.

Additionally, RID is particularly concerned that the Working Group has failed to consistently develop groundwater remedial alternatives that consider RID’s water management plans in the WVBA WQARF Site, as required by Arizona law.²⁹ RID has repeatedly informed ADEQ and the Working Group³⁰ that water

²⁴ ARS § 49-263.D.

²⁵ WG Comments to ADEQ, 18 (November 7, 2014)

²⁶ ARS § 49-224.B.

²⁷ ARS § 49-263.

²⁸ See M52 OU2 CERCLA Site, 56th St. and Earll Dr. WQARF Site, WOC WQARF Site, NIBW CERCLA Site, and PGA North CERCLA Site.

²⁹ AAC R18-16-407.H.2.

supplies from RID wells in the WVBA WQARF Site must be protected for all beneficial uses given RID's plan to develop this water source for municipal supply in the coming years. Consistent with its plans, RID has adopted a policy that "any RID wells located within any Federal or State Superfund Site and that are contaminated by hazardous substances ... must be remediated pursuant to an appropriate and timely groundwater remedial action plan to mitigate the actual and/or potential harm to public health, welfare, and the environment."³¹ RID also requires that "any discharges of remediated groundwater into the RID water distribution system must be of a quality that meets the United States Environmental Protection Agency Maximum Contaminant Levels and the Arizona Aquifer Water Quality Standards [AWQs] for the associated contaminants of concern."³²

Although the Working Group gave lip service to the importance of complying with RID's stated water management policy,³³ the WGFS Report, in fact, disregarded critical provisions of the RID policy³⁴ and intentionally distorted the scope of other provisions of RID's policy³⁵ in the hope of avoiding having to treat RID wells impacted above AWQs that the Working Group acknowledges are "necessary and critical"³⁶ to all of the WGFS proposed remedial alternatives.

³⁰ RID, Land and Water Use Study Questionnaire (January 12, 2010); *Comments on Working Group Proposed Feasibility Study Work Plan for the WVBA WQARF Site*, prepared by Synergy Environmental, May 6, 2013.

³¹ Roosevelt Irrigation District Board of Directors Statement of Policy regarding Superfund Sites (Nov. 9, 2010).

³² *Id.* SRP has adopted a similar policy regarding the quality of remediated groundwater discharged into its distribution system for irrigation use. See SRP Irrigation Newsletter, *SRP Supports Central Phoenix Groundwater Cleanup Project* (August 16, 1999) (declaring that "SRP has agreed to accept the treated groundwater generated by the project" and that the "water will be cleaned to meet drinking water standards ... then piped to SRP's Grand Canal, where the water will be used for irrigation purposes. ... SRP supports this groundwater project as an important step in managing local water resources. Pumping the groundwater and cleaning it at a treatment facility will prevent the further spread of contamination to SRP and city wells. The project will improve the groundwater quality in the central Phoenix area over time." In fact, SRP has reserved the right to "temporarily stop accepting the discharge ... if the quality of the discharge does not meet applicable standards." SRP and Motorola letter to ADEQ and EPA (March 1, 1999).

³³ "Based on RID's policy for accepting remediated groundwater, extracted groundwater would need to be treated to AWQS for WVBA COCs prior to discharge to the RID system (RID, 2010b)." WGFS Report, page 28.

³⁴ "[A]ny RID wells located within any Federal or State Superfund Site and that are contaminated by hazardous substances ... must be remediated pursuant to an appropriate and timely groundwater remedial action plan to mitigate the actual and/or potential harm to public health, welfare, and the environment."

³⁵ Contrary to the plain language of RID's policy requiring "any discharges of remediated groundwater into the RID water distribution system must be of a quality that meets ... AWQS", which was clearly understood by the Working Group as noted in fn. 33 above, the Working Group unilaterally alters the scope of RID's policy to apply only to "third party discharges to its system [that] would require treatment for COCs prior to discharge." WGFS Report, pages 49 and 55.

³⁶ WGFS Report, page 19.

Not only would treatment of RID's contaminated wells impacted above the AWQs be consistent with RID's water management policies, but such treatment is required to comply (and not violate) WQARF's statutory requirements in ARS § 49-282.06.A.1 and A.2 that all remedial actions shall "assure the protection of public health and welfare and the environment" and "provide for the control, management or cleanup of the hazardous substance in order to allow the maximum beneficial use of the waters of the state," as is more fully discussed above in the first issue discussed.

RID's water management policies also are consistent with two additional mandatory WQARF remedial selection requirements found in ARS § 49-282.06.B.4.b and AAC R18-16-407. Pursuant to ARS § 49-282.06.B.4.b, "the selected remedy shall address, at a minimum, any well that at the time of selection of the remedial action ... if the well would now or in the reasonably foreseeable future produce water that would not be fit for its current or reasonably foreseeable end uses without treatment due to the release of hazardous substances."³⁷ RID has informed ADEQ and the Working Group that RID's wells within the WVBA WQARF Site will, within five years,³⁸ supply water for municipal use in the West Valley communities, within the borders of RID's service area. In fact, in 2010, the Town of Buckeye informed ADEQ that "the Town is very interested in the utilization of the treated water from the RID remediation effort as a much-needed resource to our future development."³⁹ The Town of Buckeye's expressed interest in RID's treated water, like other West Valley cities,⁴⁰ is because "there is no issue more important to the quality of life and economic viability in the West Valley communities than dependable sources of usable water."⁴¹ According to ADEQ's recent monitoring data, RID's FS Report and the WGFS Report, the groundwater pumped from 13 of RID's existing wells within the WVBA WQARF Site is not fit for its reasonably foreseeable municipal end use without treatment due to the groundwater contamination exceeding the applicable MCL numeric and narrative aquifer water quality standards. In short, to be compliant with ARS § 49-282.06.B.4.b, the selected remedy must address all RID wells that either "now or in the reasonably foreseeable future" (*i.e.*,

³⁷ ARS §49-282.06.B.4.b. (emphasis added).

³⁸ There are ongoing discussions with various private parties to fund a dedicated pipeline for remediated water, which would make moot the arguments raised by the PRPs regarding the effluent present in the RID Main Canal.

³⁹ Letter from Jackie A. Meck, Mayor of Town (now City) of Buckeye, to Benjamin Grumbles, Director of ADEQ (September 23, 2010).

⁴⁰ In 2010, the City of Goodyear informed ADEQ of "the City of Goodyear's interest in participating in the future utilization of the remediated water supply." Letter from Charles McDowell, City of Goodyear Public Works Director, to Benjamin Grumbles, Director of ADEQ (September 24, 2010).

⁴¹ Letter from Jackie A. Meck, Mayor of Town (now City) of Buckeye, to Benjamin Grumbles, Director of ADEQ (September 23, 2010).

within at least the next 100 years) would produce water that would not be fit for use as a municipal water supply which has been determined by ADEQ as one of the reasonably foreseeable end uses of the WVBA aquifer and by RID in its future water supply plans. Despite the acknowledgement in the WGFS Report that the selected remedy shall require that “extracted groundwater would need to be treated to AWQS for WVBA COCs,”⁴² none of the WGFS proposed remedial alternatives treat the groundwater pumped from impacted RID wells to achieve the reasonably foreseeable [municipal] end uses of the WVBA aquifer as required by ARS. § 49-282.06.B.4.b and RID’s water management policy.

Pursuant to AAC R18-16-407, the proposed remedial alternatives shall be “capable of achieving *all* remedial objectives” established by ADEQ for each WQARF Site.⁴³ Consistent with RID’s water management policy, ADEQ’s remedial objectives for the WVBA WQARF Site require that the selected remedy must “protect, restore, replace or otherwise provide a water supply for municipal use ... if the *current and reasonably foreseeable future uses are impaired or lost due to contamination from the site.*”⁴⁴ Unlike ARS § 49-282.06.B.4.b, which focuses on addressing existing wells “at the time of selection of the remedial action,” the remedial objectives address the aquifer as a whole to ensure “a water supply for municipal use.” After discussions with the current or reasonably foreseeable future municipal well owners within the WVBA WQARF Site (COP, RID and SRP), ADEQ determined that “[r]emedial actions *will be in place for as long as need for the water exists, the resource remains available and the contamination associated with the WVBA WQARF site prohibits or limits groundwater use.*”⁴⁵ COP, RID and SRP have informed ADEQ that the WVBA aquifer is and will be a needed water supply for municipal use.⁴⁶ However, unlike the RID FS Report, all of the WGFS proposed remedial alternatives fail to ensure that the WVBA aquifer is cleaned up to “protect, restore, replace or otherwise provide a water supply for municipal use” and will not “be in place for as long as ... the contamination associated with the WVBA WQARF Site prohibits

⁴² WGFS Report, page 25. As noted above, the WGFS proposed remedial alternatives all require the pumping and extraction of groundwater from RID’s wells but refuse to treat the water to meet the reasonably foreseeable use for the WVBA aquifer.

⁴³ See AAC R18-16-407.E.1 and AAC R18-16-407.A (emphasis added).

⁴⁴ ADEQ, Final Remedial Objectives Report, 3-3. (emphasis added).

⁴⁵ *Id.*

⁴⁶ The COP has acknowledged to ADEQ that “the COP will depend more heavily on this groundwater to provide for service area water demands later in the 50-year planning horizon.” RID noted that “the future use may be drinking water supply for residential and commercial development within the RID water district.” Similarly, SRP noted that “the future use may be drinking water supply for residential and commercial development.” ADEQ, Final Remedial Objectives Report, 3-2.

or limits groundwater use” for municipal use.⁴⁷ Instead, the Working Group proposes that the contamination simply be allowed to unlawfully move downgradient “towards the pumping depression known as the Luke Sink, near the Luke Air Force Base” and potentially threaten additional wells along that path.⁴⁸

Failure by all of the WGFS proposed remedial alternatives to address any of RID’s acknowledged “necessary and critical” impacted wells demonstrates that each of the WGFS proposed remedial alternatives fails to “compl[y] with A.R.S. § 49-282.06” and are not “capable of achieving all of the remedial objectives”⁴⁹ for the WVBA WQARF Site as required by Arizona law, and, therefore, cannot be approved by ADEQ.

3. The WGFS Report establishes non-authorized “contingency remedial strategies or remedial measures” to avoid “compl[ying] with A.R.S. § 49-282.06,” or “achieving all of the remedial objectives”⁵⁰ for the WVBA WQARF Site and cannot be approved by ADEQ.

In addition to not complying with the mandatory WQARF remedial action criteria in ARS § 49-282.06 or achieving the applicable numeric and narrative aquifer water quality environmental standards as discussed above, the Working Group does not intend to achieve the remedial objectives for the WVBA WQARF Site despite their claim that “contingent measures may be necessary to ensure that impacted groundwater meets AWQS.” The Working Group incorrectly states that the “issue for regulatory determination is what current or contingent actions can or should be taken to address protection of existing or future potable

⁴⁷ According to the WGFS Report, the limited remedial actions in the Reference Remedy and More Aggressive Remedy are assumed to cease operating in 2026 because “the efficacy of the new extraction well[s] primarily depends on operating alongside the current RID pumping regime.” WGFS Report, pages 49 and 54. According to Appendix A-29 of the WGFS Report, the contamination associated with the WVBA WQARF site will continue to prohibit or limit groundwater use for municipal use.

⁴⁸ According to the WGFS Report, any potentially threatened wells in the path of this downgradient movement would be addressed by relocation outside the plume or constructed into the unimpacted LAU. WGFS Report, page 31.

⁴⁹ See AAC R18-16-407.A and AAC R18-16-407.E.1. As noted in the WGFS Report, ADEQ has established remedial objectives for municipal groundwater use, based on the questionnaires submitted by COP, SRP and RID, “to protect, restore, replace or otherwise provide a water supply for municipal use by currently and reasonably foreseeable municipal well owners within the WVBA WQARF site if the current and reasonably foreseeable future uses [within at least the next 100 years] are impaired or lost due to contamination from the site.” The WGFS Report clearly acknowledges that the AWQSs adopted “to preserve and protect the quality of those waters [in all aquifers] for all present and reasonably foreseeable future uses” will not be met by any of the WGFS proposed remedial alternatives. See Figure A-29. This raises the specter of a criminal violation of the applicable aquifer water quality standards. See ARS § 49-263.

⁵⁰ See AAC R18-16-407.A and AAC R18-16-407.E.1.

water-provider wells.”⁵¹ The required regulatory determination for ADEQ is whether a FS Report “complies with A.R.S. § 49-282.06” and “is capable of achieving *all* of the remedial objectives.”⁵² The WQARF rules clearly state that the “reference remedy and any alternative remedy also may include contingent remedial strategies or remedial measures [but only] *to address reasonable uncertainties regarding the achievement of remedial objectives or uncertain time-frames in which remedial objectives will be achieved.*”⁵³ Despite the clear and limited regulatory scope for considering any contingency strategies and measures in any FS report, the Working Group unilaterally and unlawfully adopted and broadly applied “contingency strategies and measures to address: Uncertainties regarding the time frames in which future water uses might occur; Possible but uncertain future changes in regional pumping conditions that could affect plume migration, resulting in potential impairment of additional wells; Uncertainties regarding the development of future technologies ...; and Other reasonable uncertainties regarding the achievement of ROs.” Despite the Working Group’s unauthorized attempt, the applicable WQARF rules make it clear that if there are no “reasonable uncertainties regarding the achievement of remedial objectives or uncertain time-frames in which remedial objectives will be achieved,” then there cannot be any “contingent actions.”

One of the applicable municipal groundwater use remedial objectives for the WVBA WQARF Site is to “protect, restore, replace or otherwise provide a water supply for municipal use by currently and reasonably foreseeable future municipal well owners within the WVBA WQARF Site if the current and reasonably foreseeable future uses are impaired or lost due to contamination from the site.”⁵⁴ The WGFS Report clearly acknowledges that “[g]roundwater extraction and treatment ... is considered a feasible technology within the WVBA” and that “extracted groundwater would need to be treated to meet AWQS for WVBA COCs prior to reinjection or discharge to an end user.”⁵⁵ The certainty that groundwater extraction and treatment of contaminated water supply wells can comply with the specific WVBA WQARF Site remedial objective to “protect, restore, replace or otherwise provide a water supply for municipal use” has not only been acknowledged by the Working Group, but has been proven by the ADEQ-approved RID Modified ERA in the WVBA WQARF Site and by the cleanup of other similar groundwater contamination sites in Arizona. In fact, the liquid phase granular activated carbon (LGAC) treatment technology used by RID in implementing the ADEQ-approved Modified ERA and by

⁵¹ WG Comments to ADEQ on RID’s FS Report, 6 (November 7, 2014) (emphasis added).

⁵² See AAC R18-16-407.J; R18-16-407.A; R18-16-407.E.1. (emphasis added).

⁵³ AAC R18-16-407.E.1. (emphasis added).

⁵⁴ See ADEQ, Final Remedial Objectives Report, 3-2,3-3 (August 8, 2012). WGFS Report, page 16.

⁵⁵ WGFS, page 25.

regulatory agencies and private parties at other Arizona cleanup sites proves that the remedial objective “to protect, restore, replace or otherwise provide a water supply for municipal use” for “current and reasonably foreseeable future uses” of groundwater within the WVBA WQARF Site can be timely achieved⁵⁶ by the mere implementation of such proven LGAC treatment technology.⁵⁷ Given that there are no “reasonable uncertainties regarding the achievement of [the] remedial objectives [for the WVBA WQARF Site] or uncertain time-frames in which [the] remedial objectives [for the WVBA WQARF Site] will [or can] be achieved,” no “contingent remedial strategies or remedial measures” are appropriate or necessary.

Not only will the WGFS proposed remedial alternatives fail to “compl[y] with A.R.S. § 49-282.06,” or be “capable of achieving all of the remedial objectives” for the WVBA WQARF Site, so do the WGFS Report’s “potential contingent measures.”⁵⁸ Under the “contingent measures,” the aquifer will remain unlawfully contaminated with hazardous substances above the applicable numeric and narrative AWQs adopted for the “protection of the public health and the environment,”⁵⁹ and the plume will not be controlled⁶⁰ or cleaned up “to preserve and protect the quality of those waters [in all aquifers] for all present and reasonably foreseeable future uses,”⁶¹ “in order to allow the maximum

⁵⁶ The WGFS Report acknowledges that a “groundwater extraction and [LGAC] treatment system has been operating at the M52 OU2/OU3 boundary since 2001 ... [and] [o]perating the system for the past 13 years has effectively cut off the dissolved-phase groundwater plume at this location ... [and] [b]ecause of this, overall VOC concentrations in OU3 groundwater, and in the eastern and central portions of the WVBA in UAU1, have declined significantly over time, in some cases up to approximately two orders of magnitude, and the overall plume width has diminished.” WGFS Report, A-17.

⁵⁷ The WGFS Report acknowledges that “LGAC is the selected water treatment technology for the WVBA VOCs ... due to its proven performance, relative low-cost and low maintenance, and treatment reliability.” In fact, the WGFS Report states that “EPA considers LGAC the Best Available, Demonstrated Control Technology for treating groundwater containing VOCs.” WGFS Report, page 25.

⁵⁸ Section 6.2.2 of the WGFS Report includes the summary of potential contingent measures that apply to all proposed remedial alternatives.

⁵⁹ ARS § 49-221.C.1.

⁶⁰ According to the WGFS Report, “should RID irrigation pumping ... cease in the future, groundwater modeling indicates that static water levels in the central portion of the WVBA may rise up to 80+ feet over a period of 15 to 20 years” resulting in potentially increased concentrations of VOCs in the groundwater. WGFS Report, page 19. Similarly, “[s]hould RID irrigation pumping within the WVBA cease, the overall groundwater flow direction would likely shift to the northwest, towards the regional pumping depression known as the Luke Sink, near the Luke Air Force Base” and water supply “wells in this new downgradient direction may need to be addressed.” WGFS Report, pages 7 and 19. However, the aquifer will not be cleaned up, the WGFS Report would simply remove or relocate the threatened or impacted wells outside of the plumes new downgradient direction or into the LAU since “[v]ertical migration of impacted UAU groundwater resulting from operating a LAU production well is not anticipated, as the UAU and LAU aquifers appear to be isolated by the relatively thick, fine-grained MAU.” WGFS Report, page 33. *See* WGFS Report, page 31 for “base remedial measures.”

⁶¹ ARS § 49-221.A.



beneficial use of the waters of the state,”⁶² or “to assure protection of public health and welfare and the environment”⁶³ as required by Arizona law.

Further elaboration on failure of the WGFS Report to appropriately identify and evaluate credible remedial actions is provided in **Attachment 5** of this letter.

4. The WGFS Report presents an overly simplistic Site Conceptual Model that inappropriately down plays groundwater contamination impacts in the WVBA WQARF Site.

In describing the nature and extent of contamination, the WGFS Report indicates the regional VOC contamination predominantly impacts UAU1 groundwater and that these contaminants “can be flushed through the aquifer relatively quickly once continuing sources are controlled or eliminated.”⁶⁴ VOC contamination in deeper UAU2 groundwater is said to be, in effect, sequestered in fine-grained sediments such that only a relatively small VOC mass impacts groundwater flow.⁶⁵ The WGFS Report conveys the impression that large areas of the plume will be mitigated through the natural attenuation of the hazardous contaminants and that no real remedial action is necessary, which has continued to be the Working Group’s unreasonable position despite ADEQ approval of RID’s ERA and Modified ERA as “reasonable, necessary and cost-effective” remedial actions to address the groundwater contaminated by multiple hazardous substances, including a known human carcinogen.

The declining trend in VOC concentrations in the aquifer, which still exceed applicable AWQSSs, is not the result of “natural attenuation” as falsely indicated by the WGFS Report, but is a result of the “groundwater extraction from regional irrigation pumping, [to which] VOC concentrations in the regional plume within UAU1 have generally been declining over time.”⁶⁶ Despite stating that the “aggregate effects of irrigation pumping is the formation of a regional hydraulic trough or sink within the WVBA, with capture zones of the regional irrigation wells extending over the WVBA plume footprint,” the WGFS Report fails to apply, as required by ARS § 49-282.06.A.2, the provisions of Section 5.3.1 in the WGFS Report to the extraction of these acknowledged “critical and necessary” RID wells.⁶⁷

⁶² ARS § 49-282.06.A.2.

⁶³ ARS § 49-282.06.A.1.

⁶⁴ WGFS Report, Fn 13.

⁶⁵ WGFS Report, A-18-19.

⁶⁶ WGFS Report, page 20.

⁶⁷ Section 5.3.1 of the WGFS Report states that “groundwater extraction and treatment via one or more pumping wells is considered a feasible technology within the WVBA” and the extraction wells “within the core of the plume would remove dissolved-phase mass in higher VOC concentration areas and help

Contrary to the conceptual views touted in the WGFS Report, the WVBA WQARF Site fits all the characteristics of a “complex contaminated groundwater site.”⁶⁸ Complex sites have areally extensive groundwater contamination, heterogeneous geology, large releases and/or source zones, multiple and/or recalcitrant contaminants, heterogeneous subsurface contaminant distribution, long time frames since releases occurred, and, due to inherent geologic complexities and complicated contaminant histories, restoration of the aquifer will take a long time (100 years). Therefore, in contrast to the WGFS overly simplistic conceptual model, a reasoned analysis of the regional groundwater contamination impacting the WVBA WQARF Site, one that appropriately considers the magnitude and extent of contamination impacts, would lead to the need for direct remedial action to address the actual challenges from such a complex site and the significant time required to remediate groundwater within the WVBA WQARF Site to be consistent with Arizona’s applicable numeric and narrative AWQs, the mandated remedial action criteria in ARS § 49-282.06, and ADEQ’s established remedial objectives for the WVBA WQARF Site.

Further elaboration on limitations pertaining to the WGFS Site Conceptual Model is provided in **Attachment 6** of this letter.

5. Impact of Selected Remedy on Assured Water Supply, Water Rights, and End Use

Once again, the Working Group raises issues that are not applicable to the selection of a remedy to address the groundwater contamination in the WVBA WQARF Site. In addition to raising inapplicable issues, the Working Group distorts the facts and law. For example, the Working Group continues to allege that “RID’s proposed remedy ... will have negative impacts on the [City of Phoenix’s] Designation of Assured Water Supply”⁶⁹ and that the “Arizona Department of Water Resources (ADWR) has expressed concern about RID’s authority to move groundwater from within the boundaries of a water provider that has obtained a Designation of Assured Water Supply (in this case the COP) and the potential to negatively affect that Designation (ADWR, 2010).”⁷⁰ In a blatant effort to mislead ADEQ and the public by including the prior ADWR

expedite declining VOC concentration trends.” WGFS Report, page 25. The WGFS Report also states that for “each end use scenario, extracted groundwater would need to be treated to meet AWQS for WVBA COCs prior to reinjection or discharge.” *Id.*

⁶⁸ National Research Council, 2013. *Alternatives for Managing the Nation’s Complex Contaminated Groundwater Sites*. Washington, DC: National Academies Press.

⁶⁹ WG Comments, page 8 of 33.

⁷⁰ WGFS Report, pages 14-15.

statement, the Working Group intentionally failed to disclose ADWR's October 2013 letter to RID addressing ADWR's "May 7, 2010 letter suggest[ing] that 'a difference of opinion regarding the duration of the contract' between RID and [SRVWUA] could negatively affect the legal availability of groundwater pumped by RID."⁷¹ To provide ADEQ with a complete record, ADWR stated in its October 2013 letter to RID that "[a]fter review, the Department has determined that the duration of these agreements would not affect the legal availability of groundwater pumped by RID for use within its boundaries, for purposes of Assured Water Supply determinations."

Similarly, the Working Group would have one believe that "RID's proposed remedy ... will negatively impact [the COP's] ability to rely on groundwater beneath the WVBA for droughts and future growth." However, the Working Group (of which the COP is a member) already has acknowledged that the COP is not relying on the contaminated portions of the groundwater beneath the WVBA for droughts and future growth. "If the COP needs to install a production well within the WVBA in the reasonably foreseeable future and the water quality is not fit for its intended use at that time ... the well would be located in an area where water quality is sufficient for its intended use or the well deepened to produce water only from the LAU."⁷² Such actions would be consistent with COP's published policy that "the COP currently does not allow direct discharge of treated groundwater into its municipal drinking water distribution system."⁷³

The WGFS Report also erroneously assumes (without any legal or factual support) that the pumping of the RID wells will end in 2026 based on an alleged dispute of RID's water rights to pump its wells.⁷⁴ However, RID's water rights have no bearing on the remedy that ADEQ must select in order to comply with all applicable and mandatory remedial action criteria, including "to the extent practicable, provide for the control, management or cleanup of the hazardous substances in order to allow the maximum beneficial use of the waters of the state."⁷⁵ The Working Group has acknowledged that the pumping of RID's wells is "necessary and critical" to any remedial alternative⁷⁶ and that "the capture zones of the RID irrigation wells encompass the current plume footprint" and are

⁷¹ Letter from Andrew J. Craddock, Manager of Recharge, Assured & Adequate Water Supply Program, to Donovan Neese (October 21, 2013).

⁷² WGFS Report, page 60.

⁷³ WGFS Report, page 27.

⁷⁴ WG Comments, pages 7-8. As noted above, ADWR reviewed the contracts that SRP alleges will terminate RID's existing water rights in 2026 and "determined that the duration of these agreements would not affect the legal availability of groundwater pumped by RID for use within its boundaries, for purposes of Assured Water Supply determinations."

⁷⁵ ARS § 49-282.06.A.2.

⁷⁶ WGFS Report, page 19.

“sufficient to control the plume migration at concentrations above the AWQS.”⁷⁷ There are other regulatory means to ensure that these acknowledged “necessary and critical” RID wells continue to operate in order to achieve applicable aquifer water quality environmental standards, to comply with the mandatory remedial action criteria in ARS § 49-282.06, including “the control, management or cleanup of the hazardous substances in order to allow the maximum beneficial use of the [ground]waters of the state,” and to “achiev[e] *all* of the remedial objectives” established by ADEQ for the WVBA WQARF Site. Other groundwater contamination cleanups are implemented without the operating party possessing independent water rights. In fact, the Working Group recognizes the benefits of the Motorola 52nd Street Operable Unit 2 extraction system, which is operated without independent water rights, in reducing “the ongoing VOC mass flux across the WVBA border.”⁷⁸

Finally, the WGFS Report makes repeated references to the “legal authority” required for RID to change its current irrigation end use to deliver water to third party drinking water providers for potable use. The Working Group cites statutory requirements that they believe to be potential barriers to the use of RID remediated water from the WVBA Site as a source of future drinking water. RID disagrees with these assertions as stated in **Attachment 7** of this letter

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

⁷⁷ WGFS Report, page 39. In fact, the Working Group acknowledges that the additional extraction wells in the Working Group’s Reference Remedy and More Aggressive Remedy simply “provide for additional COC mass removal within the plume core” (*Id.*) and that the additional wells are meaningless without the pumping of the RID wells (additional wells cease operating because “the efficacy of the new extraction well primarily depends on operating alongside the current RID pumping regime”) (WGFS Report, page 49). The Working Group has made it clear that “the plume is not migrating and will not migrate as long as RID’s pumping continues.” (WG Comments, page 11 of 33).

⁷⁸ WGFS Report, page 19.



cc: Laura Malone, ADEQ Director Waste Programs
Tina LePage, ADEQ Manager Remedial Projects Section
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ATTACHMENT 1

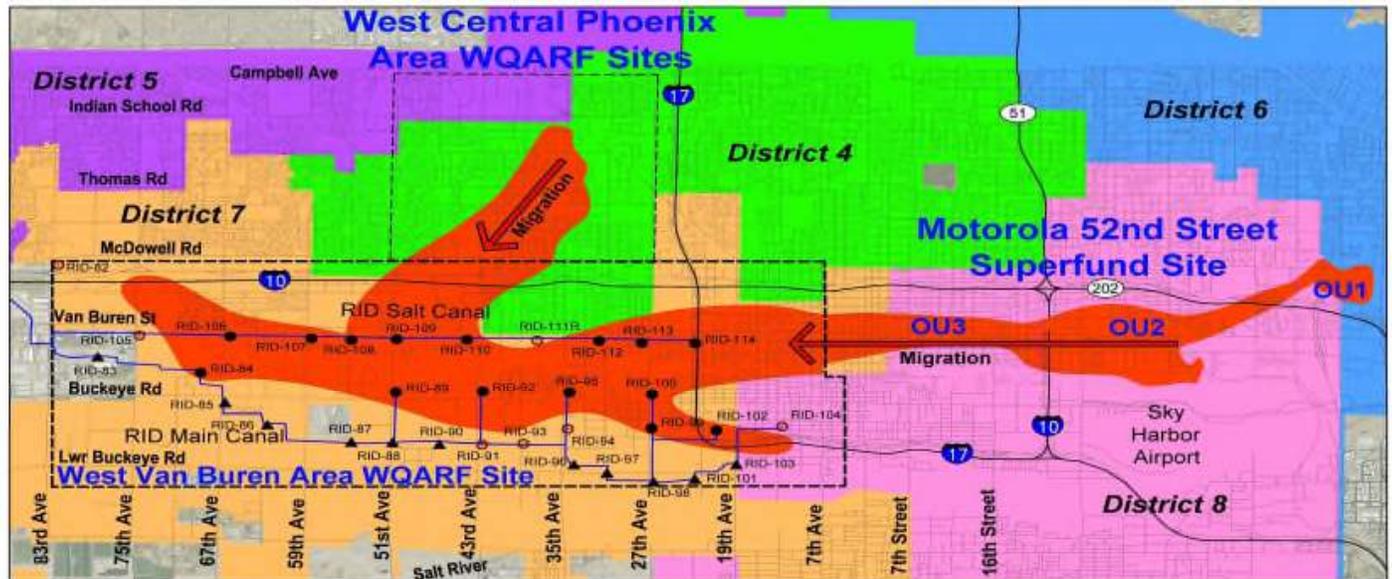
FACT SHEET

West Van Buren Area (WVBA) Site

(Prepared by the Roosevelt Irrigation District (RID))

WVBA Site Boundary and Background

- The WVBA Site is the western half of a massive 15-mile long plume of contaminated groundwater beneath central and west-central Phoenix (7th Ave. to 83rd Ave. and McDowell Rd. to Lower Buckeye Rd.)



Groundwater Plumes Impacting And Threatening RID Wells



- The Arizona Department of Environmental Quality (ADEQ) has been investigating the WVBA Site under the Arizona Water Quality Assurance Revolving Fund (WQARF) remediation program for over 20 years, but has not yet selected a groundwater remedy.
- Groundwater contamination has been caused by widespread releases of industrial volatile organic compounds (VOCs), including the known human carcinogen trichloroethene (TCE), from prominent businesses, corporations and public agencies, including the City of Phoenix, Maricopa County, United States Department of Energy, SRP, Honeywell, Univar, Dolphin and many others.

Impact to Local Community

- Because the pollutants are volatile, pumping of this contaminated groundwater annually releases nearly 3,000 pounds of these hazardous VOCs into the local community air (averaged over the last 10 years).
- Although the contaminated groundwater does not affect the City of Phoenix's current drinking water supply, the aquifer under the WVBA WQARF Site has been determined to be a future drinking water supply for Maricopa County, including West Valley communities.
 - Current contamination levels (max ~ 35-70 ppb TCE) exceed the current state Aquifer Water Quality Standards and federal drinking water standards for TCE (5 ppb). In fact, EPA has determined that TCE is significantly more toxic based on new toxicity studies, which have not yet been factored into the current water quality standards (expected to be much lower in the future).
- Unlike the following sites in other Arizona communities with similar groundwater contaminant plumes, the WVBA WQARF Site has not been aggressively pursued and remediated by systematically treating the polluted groundwater to remove the VOC contaminants to applicable drinking water standards and prohibiting any transfer of contaminants into the air from the contaminated groundwater:
 - North Indian Bend Wash (NIBW) Superfund Site - Scottsdale and Paradise Valley (EPA lead).
 - Motorola 52nd Street (M52) Superfund Site - East Phoenix (EPA lead).
 - Phoenix-Goodyear Airport (PGA) Superfund Site – Goodyear (EPA lead).
 - Tucson International Airport Area (TIAA) Superfund Site – Tucson (EPA lead).
- Years of additional delay in implementing an effective remedy will result if the parties legally responsible for the groundwater contamination continue their delaying tactics, avoiding financial responsibility, and shifting the financial burden onto the Arizona taxpayers and the State of Arizona.

RID's Voluntary Remediation Actions

- To date, the groundwater contamination has impacted over 20 RID wells and continues to threaten the remaining RID wells in the WVBA.
- RID voluntarily entered into an Agreement to Conduct Work with ADEQ in 2009 to begin addressing the groundwater contamination by implementing an Early Response Action (ERA) to address the most significant impacts to its wells, water supply, and to public health.
- RID has taken actions to limit public exposure to the VOCs:
 - Maintaining security fencing at all impacted RID well sites, sealing well discharge structures and enclosing several open laterals that have been used as local swimming and watering holes.
- Since 2012 RID has voluntarily implemented multiple ADEQ-approved groundwater cleanup actions in WVBA WQARF Site, including the ERA to capture and treat the hazardous VOCs from 4 of the most highly contaminated RID wells.
 - Captured over 1,750 pounds of hazardous contaminants and treated over 4 billion gallons of water.
 - The ERA wellhead treatment systems are the best-available-technology, applying the same fail-safe technology used and approved at other VOC-contaminated groundwater sites in Arizona (M52, NIBW, PGA, TIAA)
- RID has invested nearly \$20 Million in pursuing these voluntary remedial actions and developing a Feasibility Study Report.
 - RID has been forced to file a lawsuit against the parties legally responsible for the groundwater contamination so that the polluters are compelled to pay to clean up their contamination and not the Arizona taxpayer.
 - Many of the parties legally responsible for the contamination have been opposing ADEQ's approval of RID's remedial actions. Not surprisingly, these responsible parties have now submitted a Feasibility Study Report that recommends virtually no remedial action to address the groundwater contamination or the public exposure to the hazardous VOCs in violation of applicable WQARF program requirements. See Comparison of Feasibility Study reports and the WQARF requirements below.

Roosevelt Irrigation District's (RID's) FS Report	WQARF Requirements	Working Group's FS (WGFS) Report
<p>MEETS WQARF REQUIREMENT No. 1</p> <p>All four RID proposed alternative remedies will control hazardous emissions and achieve the applicable Arizona aquifer water quality standards (<i>i.e.</i>, the drinking water standards adopted by EPA) that "assure protection of public health and welfare and the environment."</p>	<p>1. Assure the protection of public health and welfare and the environment (ARS § 49-282.06.A.1)</p>	<p>FAILS WQARF REQUIREMENT No. 1</p> <p>All three WGFS proposed alternative remedies fail to control hazardous emissions or to achieve the applicable Arizona aquifer water quality standards (<i>i.e.</i>, the drinking water standards adopted by EPA) that "assure the protection of public health and welfare and the environment."</p>
<p>MEETS WQARF REQUIREMENT No. 2</p> <p>All four RID proposed alternative remedies include remedial strategies and measures used at other similarly Arizona sites that "provide for the control, management [and] cleanup of the hazardous substances in order to allow the maximum beneficial use of the waters of the state" as a drinking water source.</p>	<p>2. To the extent practicable, provide for the control, management or cleanup of the hazardous substances in order to allow the maximum beneficial use of the waters of the state. (ARS § 49-282.06.A.2)</p>	<p>FAILS WQARF REQUIREMENT No. 2</p> <p>All three WGFS proposed alternative remedies fail "to the extent practicable" to "provide for the control, management or cleanup of the hazardous substances in order to allow the maximum beneficial use of the waters of the state" as a drinking water source.</p>
<p>MEETS WQARF REQUIREMENT No. 3</p> <p>All four RID proposed alternative remedies are "reasonable, necessary, cost-effective and technically feasible" when and as compared to all other major groundwater cleanup sites in Arizona. See cost comparison on page 24 of the document referenced through the hyperlink beneath this table.</p>	<p>3. Be reasonable, necessary, cost-effective and technically feasible. (ARS § 49-282.06.A.3)</p>	<p>FAILS WQARF REQUIREMENT No. 3</p> <p>All three WGFS proposed alternative remedies fail to satisfy this WQARF "comparative" requirement because, as noted above and below, all three WGFS proposed alternative remedies fail to meet the other mandatory and "substantive" WQARF requirements (Nos. 1, 2, 4 and 5) to enable an apples-to-apples comparison.</p>
<p>MEETS WQARF REQUIREMENT No. 4</p> <p>All four RID proposed alternative remedies address any existing well in the WVBA WQARF Site that "would now or in the reasonably foreseeable future produce water that would not be fit for its current or reasonably foreseeable end uses [<i>i.e.</i>, as a drinking water source] without treatment due to the release of hazardous substances."</p>	<p>4. The remedial action shall address, at a minimum, <u>any well that would now or in the reasonably foreseeable future produce water that would not be fit for its current or reasonably foreseeable end uses without treatment due to the release of hazardous substances</u>. These measures shall not reduce the supply of water available to the owner of the well. (ARS § 49-282.06.B.4.b)</p>	<p>FAILS WQARF REQUIREMENT No. 4</p> <p>All three WGFS proposed alternative remedies fail to address, <i>at a minimum</i>, the 14 RID water supply wells impacted by groundwater contamination above the applicable numeric and narrative Arizona aquifer water quality standards and the applicable Remedial Objectives established for the WVBA WQARF Site that ADEQ has determined "may present an imminent and substantial endangerment to the public health, welfare or the environment within the [WVBA] WQARF Site"</p>
<p>MEETS WQARF REQUIREMENT No. 5</p> <p>All four RID proposed alternative remedies will "protect, restore, replace or otherwise provide a water supply" for all well owners within or adjacent to the WVBA WQARF Site as required by the remedial objectives established by ADEQ for the WVBA WQARF Site.</p>	<p>5. The reference remedy and alternative remedies shall be capable of achieving all of the remedial objectives. (AAC R18-16-407.E.1)</p>	<p>FAILS WQARF REQUIREMENT No. 5</p> <p>All three WGFS proposed alternative remedies fail to "protect, restore, replace or otherwise provide a [drinking] water supply" for RID's existing water supply wells that "are impaired or lost due to contamination from the [WVBA] site" based on the groundwater contamination that currently impacts 14 RID wells above the applicable Arizona numeric and narrative aquifer water quality standards.</p>

A more detailed chart with citations, including a chart comparing federal requirements, can be found starting on page 4 at http://www.azdeq.gov/enviro/waste/sps/download/wvb/WVB_FS_Correspondence_9_2014.pdf

ADEQ will be accepting public comments on the two proposed Feasibility Study Reports during December. Please let ADEQ and your elected officials know that the WVBA WQARF Site needs to be expeditiously cleaned up to meet all applicable standards and that the West Valley residents should be afforded the same environmental protections provided in the groundwater remedial actions for Scottsdale and Paradise Valley residents. Comments can be sent to: Danielle Taber, ADEQ Project Manager, Arizona Department of Environmental Quality, 1110 West Washington Street, Phoenix, Arizona 85007; or by email to: taber.danielle@azdeq.gov

ATTACHMENT 2

ATTACHMENT 2

RID Comments on the Overall Protectiveness of the Proposed Groundwater Remedial Alternatives in the WGFS Report

As indicated in this letter, RID believes the WGFS Report is fatally flawed and deficient in that it:

- fails to address and comply with critical FS legal requirements;
- mischaracterizes RID water rights and requirements for water use;
- presents an overly simplistic Site Conceptual Model that down plays groundwater contamination impacts in the WVBA WQARF Site; and,
- fails to adequately identify and consider remedial actions in a coherent and logical manner.

The numerous and glaring inadequacies render the WGFS Report unacceptable for further consideration in the WVBA WQARF Site remedy selection process. It is also important to point out that there are two fundamental areas of distinct disparity regarding what constitutes a reasonable and necessary groundwater remedy between the overall approach that is advocated by the Working Group and the realities that exist at similarly contaminated sites, both locally and across Arizona. These disparities include:

1. requirements to protect and restore groundwater use; and,
2. requirements for reducing uncontrolled releases of hazardous substances.

RID highlights these overarching issues to document what it believes are critical inconsistencies in how the WGFS Report addresses these very important issues and the overall lack of protectiveness of public health and the environment that would result.

RID was clear in its Feasibility Study Work Plan¹ of the importance of documenting relevant information pertinent to remedial actions at adjacent WQARF and CERCLA sites for the sake of ensuring consistency and protectiveness for the WVBA WQARF Site groundwater remedy selection.² Additionally, ADEQ is required by Arizona law

¹ See Section 4.2, *Feasibility Study Work Plan, Regional Groundwater Remedy Evaluation, West Van Buren WQARF Registry Site, Phoenix, Arizona*, prepared by Synergy Environmental, June 21, 2013.

² Although the Working Group submitted comments on the RID FS Work Plan that indicated it inappropriate to consider CERCLA sites in this analysis, RID believes that CERCLA requirements are

to consider the “availability of other appropriate federal or state remedial action” in selecting a remedy.³

1. Requirements to Protect and Restore Groundwater Use

The Working Group consistently takes the position that groundwater in the WVBA WQARF Site is suitable for its “current” irrigation use without treatment and that treatment is only required to be consistent with “reasonably foreseeable uses” such as drinking water if and when that use becomes necessary. As is evident by the responses and legal authority cited throughout this letter, RID strongly disagrees.

Given that both parties fundamentally disagree on this point and setting aside the opposing views for addressing the “reasonably foreseeable uses” of the water for M&I purposes, it is informative to look at how this issue is addressed at other contaminated sites. The WVBA WQARF Site is not the only site where groundwater is contaminated and currently used for irrigation. In the greater Phoenix area, groundwater is being pumped, treated to drinking water standards and discharged for irrigation purposes at the following WQARF and CERCLA sites:

- Phoenix Goodyear Airport (PGA) CERCLA Site in Goodyear
- North Indian Bend Wash (NIBW) CERCLA Site in Scottsdale
- Motorola 52nd Street (M52) CERCLA Site (OU-2) in Phoenix
- 56th Street and Earll Drive WQARF Site in Phoenix
- West Osborn Complex (WOC) WQARF Site in Phoenix
- Central and Camelback WQARF Site in Phoenix

SRP (who is a Working Group member) uses groundwater for irrigation use, through their groundwater supply wells or as part of site remedial actions, in all of these sites except PGA. SRP requires the potentially responsible parties (PRPs) at these sites to treat all discharges of contaminated groundwater to drinking water standards prior to delivery to the SRP canals. At the PGA site, RID receives remediated groundwater for irrigation use. RID requires the PRPs at the PGA site to treat all discharges of contaminated groundwater to drinking water standards prior to delivery to the RID canal.

At all of the aforementioned groundwater contamination sites, the groundwater being used for irrigation purposes is arguably suitable for that use without treatment. However, in *all* cases the contaminated groundwater that is pumped and delivered for irrigation use is first treated to remove VOCs to concentrations that are safely below drinking water standards. The practice of treating contaminated groundwater that is used for non-potable purposes at these sites is not done to address the risks posed to the end use for urban and agricultural irrigation, it is done to address the concern elaborated in the next point.

applicable or relevant and appropriate to a cleanup under the Arizona WQARF program, as documented in Attachment 4 of this letter.

³ ARS § 49-282.06.C.7.

2. Requirements for reducing uncontrolled releases of hazardous substances

Groundwater contaminants at the major WQARF and CERCLA sites in the Phoenix and Tucson urban areas are hazardous VOCs, and it is well understood that these contaminants will readily and rapidly volatilize into the air when groundwater is pumped and turbulently discharged to receiving water outfalls. Within the WVBA WQARF Site, the large scale pumping of RID water supply wells is recognized as the primary route of migration by which contaminants in groundwater come in contact with the public and environmental receptors. Recent data indicate groundwater pumping in the WVBA WQARF Site has resulted in uncontrolled releases of over 2,000 pounds of VOCs annually.⁴

The Working Group admits there are public exposures to these hazardous contaminants at the WVBA WQARF Site and that there is some level of risk associated with these exposures. However, the Working Group makes these backhanded admissions through the use of the word “acceptable.” They have concluded that, while there are public exposures, “the exposures to the public are acceptable.”⁵ However, this assessment only considers current and potential future exposures and does not take into account long-term exposures to the public from historical activities at the Site.⁶

RID understands the Working Group members take the position that there is no need to treat contaminated groundwater at the WVBA WQARF Site in order to avoid facing the legal liability, responsibility and costs associated with these exposures and risks. The obvious question is: *does the public find the exposure to these hazardous substances, which are known and suspected human carcinogenic compounds, acceptable?*

The issue of public exposure to hazardous VOCs and what this means regarding the overall protectiveness of public health, welfare, and the environment has been addressed at many of the WQARF and CERCLA sites that are more advanced in the remedy selection process and where groundwater remediation is being conducted. At all VOC-contaminated groundwater sites, ADEQ and EPA have consistently taken the position that:

- it is unacceptable to transfer hazardous VOC contaminants from groundwater to air;

⁴ As noted on page 65 of the RID FS Report, an average of 2,900 pounds of target VOCs (TCE, PCE, and 1,1-DCE) were released to the local environment each year over the past 10 years.

⁵ WGFS Report, pages 59 and 61.

⁶ There is no way of knowing the extent of this impact or the conditions occurring in earlier decades when large scale contaminant releases to groundwater actually occurred. See ADEQ requirements in ADEQ’s Approval of RID’s Modified ERA (February 1, 2013).

- hazardous VOCs in groundwater should be removed from the environment and treated or disposed of appropriately; and,
- groundwater remedial actions require a high degree of public protection against potential exposure to hazardous VOCs in air.

Consequently, ADEQ and EPA have consistently required treatment to reduce uncontrolled releases of hazardous VOCs to the environment at all operating groundwater extraction wells, regardless of whether the contaminated groundwater is used for drinking water, irrigation, or otherwise.

Recent actions taken at the WOC WQARF Site substantiate ADEQ's position on this matter. In evaluating potential groundwater treatment technologies as part of the WOC WQARF Site FS,⁷ ADEQ required treatment of hazardous VOCs in extracted groundwater to address uncontrolled releases and provide a high degree of public protection against potential exposures to hazardous VOCs in air.⁸ In fact, liquid-phase GAC technology was specifically selected to prevent such possibilities in their active remediation efforts. Treatment to address uncontrolled hazardous VOCs was required even though there were no Maricopa County regulatory requirements.⁹ Rather, it was stated that the use of treatment was a matter of ADEQ internal policy and because the WOC WQARF Site "*encompasses predominantly residential neighborhoods*" and there may consequently be "*political and/or public perception concerns*".¹⁰

The WGFS Report fails to address these requirements for reducing uncontrolled hazardous VOC emissions and such an approach is completely inconsistent with how the issue is addressed at all other WQARF and CERCLA sites in the state. In particular contrast, the treatment technology at the WOC WQARF Site specifically focuses on reducing uncontrolled hazardous VOC emissions even though the amount of VOCs in extracted groundwater is 100 times less than that occurring at the WVBA WQARF Site.

RID has put forward groundwater remedial alternatives in its FS Report that are consistent with the legal, technical, and policy guidelines that have been established to address uncontrolled releases of hazardous VOCs at all other WQARF and CERCLA sites in Arizona. RID developed very cost effective approaches for addressing this issue believing the minority community within the WVBA Site should be provided and would demand the same public health protections against potential exposure to uncontrolled hazardous VOC releases that are provided at all other Arizona contaminated sites.

⁷ *Final Feasibility Study Report for the Shallow Groundwater System, West Osborn Complex WQARF Site*, Phoenix, Arizona, prepared by GeoTrans, Inc., January 27, 2012.

⁸ WGFS Report, page 65.

⁹ For the Reference Remedy, which is the selected groundwater remedy, it was calculated the mass of VOCs removed by groundwater extraction at a rate of 30 gpm would be 0.083 pounds per day, or around 30 pounds per year.

¹⁰ WGFS Report, page 46.

The Bottom Line Issue is ... what constitutes a reasonable, necessary and cost effective groundwater remedy?

ADEQ is presented with two very different and opposing views regarding what constitutes an “acceptable remedy” to address regional groundwater contamination at the WVBA WQARF Site. The contrast could not be more striking.

On one side, the Working Group, which represents a consortium of businesses and industries that are likely PRPs that would be required to pay the cost of cleanup, not surprisingly advocates a minimalistic approach. The WGFS Report recommends a groundwater remedial alternative consisting of long-term groundwater monitoring along with the installation of a *single*, 500-gpm extraction well with an accompanying GAC wellhead treatment system until 2026 to address the *regional groundwater contamination* in the WVBA WQARF Site. Water from the proposed new well would be treated to drinking water standards, yet none of the other impacted RID wells that are identified as “necessary and critical” to all the WGFS proposed remedial alternatives would be treated prior to being delivered to RID for its end use. According to the WGFS Report, “*the focused remedial groundwater extraction would further reduce the concentration, volume, mass, and toxicity of COCs over time*”.¹¹

The Working Group’s recommended remedial alternative does not constitute a reasonable, necessary, and cost effective groundwater remedy by any measure.

- The WGFS Report recommended remedial alternative entails the added cost and effort of installing a new 500-gpm extraction well and GAC treatment system north of well RID-95 for “focused plume core extraction” and seeks to have RID use the treated water supply. A new extraction well is unnecessary. RID has numerous wells in the area of the so-called plume core that serve the same function as a new extraction well.
- The focused groundwater extraction of the WGFS recommended remedial alternative would have very little overall impact in reducing the concentration, volume, mass, and toxicity of the hazardous VOCs affecting the WVBA WQARF Site. According to the WGFS Report, groundwater pumping and treatment associated with this recommended remedial alternative would permanently remove an estimated 70 pounds of TCE and 4 pounds of PCE yearly from the environment.¹² This action is inconsequential to and only a small fraction (on the order of three percent) of over 2,000 pounds of VOC-contaminant mass currently withdrawn from area-wide RID groundwater pumping and released

¹¹ WGFS Report, page 71.

¹² WGFS Report, page 49.

into the environment and local community within the WVBA WQARF Site annually.¹³

- Nor is the recommended new single 500-gpm extraction well groundwater pump and treatment system cost effective. The Working Group estimates a new 500-gpm groundwater extraction well and treatment system will cost \$2.5 million to install and \$524,000 per year to operate.¹⁴ In comparison, well RID-95 was equipped with nominal 2,000 gpm wellhead GAC treatment capacity at a cost of about \$1 million to install and around \$250,000 per year to operate.¹⁵ Moreover, well RID-95 would remove over 400 pounds of VOCs annually when operated at expected rates under the RID recommended remedial alternative.¹⁶ The WGFS Report's recommended remedial alternative gets little bang for the buck. In fact, the WGFS Report acknowledges that a disadvantage of the Reference Remedy is "the relative cost of any potential additional benefit."¹⁷
- The WGFS Report does not propose remedial alternatives that have been considered reasonable and necessary by ADEQ and EPA at other similarly contaminated sites in the greater Phoenix area to protect and restore groundwater use and limit the uncontrolled releases of hazardous VOCs to air. The WGFS Report disregards the widespread contamination impacts to RID wells within the WVBA WQARF Site in the belief that the contaminated groundwater is suitable for its current irrigation use without treatment, despite ADEQ's multiple approvals of RID's ERA and Modified ERA. In contrast, groundwater delivered to SRP for agricultural irrigation from the M52 Site to the east or from the WOC WQARF Site to the north is cleaned up to drinking water levels. Further, the WGFS Report does not believe treatment is needed to otherwise address the uncontrolled releases of thousands of pounds of hazardous VOCs from groundwater to air, even though ADEQ and EPA do not allow this practice at any of the other adjacent WQARF and CERCLA sites.

On the other hand, RID has developed a groundwater remedial alternative that is reasonable, necessary, and cost effective, particularly given that the proposed remedial action provides a "regional" solution to a "regional" problem.

- RID addresses the regional groundwater contamination problem by a focused strategy of pumping and treating the six most highly contaminated RID wells through a plume management approach that enhances plume containment and increases mass removal throughout the WVBA WQARF Site. Enhanced plume containment ensures protection of other RID, SRP, Phoenix, and Tolleson wells

¹³ The actual mass of VOCs released from RID wells in the WVBA Site is a function of well operations and associated contamination levels and may range from 2,000 pounds per year (limiting pumping in the plume) to 3,500 pounds per year (prioritizing pumping of contaminated wells).

¹⁴ WGFS Report, Appendix E, Module E cost estimate.

¹⁵ July 2014 Draft RID FS Report, Table 7.

¹⁶ Assuming the well operates at 1,600 gpm at 85% duty cycle and given the currently observed VOC concentrations (TCE at 57 µg/l, PCE @ 3.6 µg/l, and 1,1-DCE at 8.4 µg/l).

¹⁷ WGFS Report, page 53.

that are located peripheral and downgradient of the contaminant plume. Increased mass removal results in reduced concentration, volume, mass, and toxicity of COCs affecting the WVBA WQARF Site.

- The use of treatment as a principal element of the proposed remedy will permanently remove thousands of pounds of hazardous VOCs from contaminated groundwater annually and limit public exposure to air toxics by greatly reducing the uncontrolled releases of VOC pollutants from contaminated groundwater into the air.
- The targeting of up to 14,000 gpm of installed treatment capacity¹⁸ at key contaminated RID well sites will enable blending of other impacted, but less contaminated, RID wells with treated water to achieve an acceptable water quality for unrestricted beneficial use.
- The capital cost of the RID recommended remedial alternative is \$9.5 million¹⁹ and is significantly below prorated costs that have been expended at other large scale pump and treat groundwater remedies in the greater Phoenix and Tucson area. The availability of existing RID land, water infrastructure, and end use makes the recommended groundwater remedial alternative particularly cost effective. The annual O&M cost is estimated to be \$1.7 million²⁰ and is similar to or less than comparable costs at other large-scale groundwater remedies in the greater Phoenix and Tucson area.
- RID's recommended remedial alternative is wholly consistent with similar remedial actions taken at adjacent WQARF and CERCLA sites to protect and restore groundwater uses and ensure overall protection of public health, welfare, and the environment.

¹⁸ Through installation of 14 skids of liquid phase granular activated carbon treatment skids, each with a nominal treatment capacity of 1,000 gpm.

¹⁹ See Table 7 of the July 2014 RID Draft FS Report.

²⁰ See Table 7 of the July 2014 RID Draft FS Report. The cost estimate for annual groundwater treatment O&M excludes costs for area-wide groundwater monitoring and capital equipment charges.

ATTACHMENT 3

Five WQARF Requirements¹ that must be Addressed Specifically during Remedy Selection and in the Proposed Remedial Action Plan

Roosevelt Irrigation District's (RID's) FS Report ²	WQARF Requirements ⁴	Working Group's FS (WGFS) Report ⁵
<p style="text-align: center;">MEETS WQARF REQUIREMENT No. 1</p> <p>All four RID proposed alternative remedies “assure the protection of public health and welfare and the environment” posed by the hazardous substances present in the groundwater within the WVBA WQARF Site.</p> <ul style="list-style-type: none"> All four RID proposed alternative remedies eliminate the risks posed to the community by the “significant volatilization and transfer of contaminants from the [contaminated ground] water into the air” as required by ADEQ,³ and the risks posed to the environment from continued contaminant migration resulting in contamination of additional groundwater resources. 	<p>1. Assure the protection of public health and welfare and the environment (ARS § 49-282.06.A.1)</p> <ul style="list-style-type: none"> Remedial actions include “<u>taking such other actions as may be necessary to prevent, minimize or mitigate damage to the public health or welfare or to the environment</u> which may otherwise result from a release or threat of release of a hazardous substance.” (ARS § 49-281.12) “In setting [water quality standards for all waters in all aquifers], <u>the director shall consider, but not be limited to, ... the protection of the public health and the</u> 	<p style="text-align: center;">FAILS WQARF REQUIREMENT No. 1</p> <p>All three WGFS proposed alternative remedies fail to “assure the protection of public health and welfare and the environment” posed by the hazardous substances present in the groundwater within the WVBA WQARF Site.</p> <ul style="list-style-type: none"> Contrary to ADEQ’s determination that the groundwater contamination “may present an imminent and substantial endangerment to the public health, welfare or the environment within the [WVBA] WQARF Site,”⁶ all three WGFS proposed alternative remedies fail to address the risks posed to the community by the “significant volatilization and transfer of contaminants, from
<ul style="list-style-type: none"> o Each RID proposed alternative remedy will 	<p><u>environment ... the provisions and</u></p>	<p>the [contaminated ground] water into the air” as</p>

¹ The five mandatory WQARF requirements are found in ARS §§ 49-282.06.A.1, A.2, A.3 and B.4.b and AAC R18-16-407.E.1.

² RID is an irrigation district operating in Arizona since 1923 with 32 wells located within or adjacent to the West Van Buren Area (WVBA) Water Quality Assurance Revolving Fund (WQARF) Site, 14 of which are contaminated by hazardous volatile organic compounds (VOCs) in the groundwater above Arizona aquifer water quality standards and Arizona drinking water standards, the remaining RID wells are threatened by the groundwater contamination. The RID Feasibility Study Report can be found on ADEQ’s website at http://www.azdeq.gov/environ/waste/sps/download/wvb/2014-07%20Draft%20RID%20FS_1.pdf.

³ See ADEQ, Approval of RID’s Modified Early Response Action (February 1, 2013).

⁴ “The [WQARF] feasibility study is a process to identify a reference remedy and alternative remedies that appear to be capable of achieving remedial objectives and to evaluate them based on the comparison criteria to select a remedy that complies with ARS § 49-282.06. (AAC R18-16-407.A) CERCLA remedial selection requirements (See Attachment 2) also are applicable or relevant and appropriate as WQARF was “modeled on the ... CERCLA, the federal superfund program” (Ariz. Admin. Register at 1492 (2002)) and Arizona law provides, “in setting [water quality standards for all waters in all aquifers], the director shall consider, ... guidelines, action levels or numerical criteria adopted or recommended by the United States environmental protection agency or any other federal agency” (ARS § 49-221.C) and “the director [of ADEQ] may adopt CERCLA rules, guidelines or procedures by reference to the extent consistent with the article” (ARS § 49-282.06.B). More importantly, the WVBA WQARF Site is directly downgradient of the Motorola 52nd Street federal Superfund Site from which contaminated groundwater enters the WVBA Site. As a result, failure of a WQARF cleanup to substantially comply with the CERCLA requirements could provide EPA the opportunity to overfile, as it did on the East Washington WQARF Site, and take over control of the WVBA WQARF Site, which will delay cleanup of the WVBA WQARF Site and could impose additional cleanup requirements at substantial cost.

⁵ The Working Group’s Feasibility Study Report can be found on ADEQ’s website at: <http://www.azdeq.gov/environ/waste/sps/download/wvb/2014-07%20Draft%20WVVBWG%20FS.pdf>.

⁶ Agreement to Conduct Work between ADEQ and RID, dated October 8, 2009.

remove and treat more than 2,500 pounds per year of hazardous substances (*i.e.*, volatile organic compounds (VOCs) that are known and suspected carcinogens) that would otherwise volatilize and transfer from the groundwater into the air, or remain and continue to migrate and contaminate additional groundwater resources.

All four RID proposed alternative remedies will achieve the applicable Arizona aquifer water quality standards (*i.e.*, the MCLs adopted by EPA) that “assure protection of public health and welfare and the environment.”

- Arizona law has established that the “primary drinking water maximum contaminant levels (MCLs) established by the [EPA] administrator... are adopted as drinking water aquifer water quality standards.” (ARS § 49-223.A)
- Each RID proposed alternative remedy includes physical containment, controlled migration, and removal and treatment measures in order to control and cleanup the groundwater contaminants and to ensure compliance with applicable Arizona aquifer water quality standards (*i.e.*, the MCLs adopted by EPA) in order to

requirements of the safe drinking water act...[and] guidelines, action levels or numerical criteria adopted or recommended by the United States environmental protection agency or any other federal agency.”⁷ (ARS § 49-221.C)

- “The department shall ... promote the restoration and reclamation of degraded or despoiled areas and natural resources.” (ARS § 49-104.A.13)
- “The director shall adopt, by rule, water quality standards for...all waters in all aquifers to preserve and protect the quality of those waters for all present and reasonably foreseeable future uses.”⁸ (ARS § 49-221.A)
- “All aquifers in this state ... shall be classified for drinking water protected use.” (ARS § 49-224.B)
- “Remedial actions will be in place for as long as need for the water exists, the resource remains available and the contamination associated with the WVBA WQARF site prohibits or limits groundwater use.” (ADEQ, Remedial Objectives Report, WVBA WQARF Registry Site, 3-3 (August 2012))

required by ADEQ³, and the risks posed to the environment by continued contaminant migration resulting in contamination of additional groundwater resources.

- All three WGFS proposed alternative remedies fail to comply with applicable ADEQ and EPA policies and guidance prohibiting “the relocation of contaminants from one media (groundwater) to another (air).”⁹
- All three WGFS proposed alternative remedies leave elevated concentrations of hazardous substances in the form of known carcinogens in the WVBA WQARF Site that after 2025, according to the assertions in the WGFS, will be allowed to migrate uncontrolled downgradient “towards the regional pumping depression known as the Like Sink, near the Luke Air Force Base” (WGFS, 7), resulting in contamination of additional groundwater resources.

All three WGFS proposed alternative remedies fail to achieve the applicable Arizona aquifer water quality standards (*i.e.*, the MCLs adopted by EPA) that “assure the protection of public health and welfare and the environment.”

- All three WGFS proposed alternative remedies fail to treat all the contaminated groundwater extracted from the WVBA WQARF Site at RID well

⁷ Chemical-specific standards that define acceptable risk levels (e.g., non-zero MCLGs, MCLs) also may be used to determine whether an exposure is associated with an unacceptable risk to human health or the environment.” EPA, *Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions* (OSWER Directive 9355.0-30, April 22, 1991).

⁸ Arizona has determined that “reasonability foreseeable uses of water are those likely to occur within 100 years unless a longer time period is shown to be reasonable.” AAC R18-16-406.D.

⁹ Letter from Amanda Stone to Keith Takata (November 14, 2007). *See also* “A remedy that achieves an acceptable risk level in one medium may not be preferred if it only achieves this level by transferring contaminants to another medium.” *Guidance on Remedial Actions*, 4-9. “Regions should ensure that cleanup levels established to restore groundwater to beneficial use, consistent with the NCP (e.g., restoration to MCLs for current or potential drinking water aquifers), also adequately address other routes of exposure associated with the groundwater, including groundwater as a source of contamination to other media.” *Summary of Key Existing EPA CERCLA Policies for Groundwater Restoration*, 9 (June 26, 2009).

<p>preserve and protect the quality of those [ground] waters for all present and reasonably foreseeable future uses” (i.e., as a drinking water source) (ARS § 49-221.A).</p> <ul style="list-style-type: none"> • Consistent with other Phoenix-area Superfund and WQARF sites, each RID proposed alternative remedy will remove and treat contaminated groundwater at RID well sites in the WVBA WQARF Site¹⁰ (with concentrations up to 75 ppb for TCE, a known carcinogen with a MCL of 5 ppb) to applicable Arizona water quality standards that “assure the protection of public health and welfare and the environment”.¹¹ • All four RID proposed alternative remedies employ remedial strategies and measures to remove and treat contaminated groundwater that “will be in place for as long as need for the water exists, the resource remains available and the contamination associated with the WVBA WQARF site prohibits or limits groundwater uses.” 		<p>sites¹⁰ (with concentrations up to 75 ppb for TCE, a known carcinogen with a MCL of 5 ppb), to applicable Arizona water quality standards that “assure the protection of public health and welfare and the environment,” and as treated at all other Phoenix-area Superfund and WQARF sites.¹¹</p> <ul style="list-style-type: none"> • All three WGFS proposed alternative remedies fail to include remedial strategies and measures necessary to control and cleanup the groundwater contaminants and ensure compliance with applicable Arizona aquifer water quality standards (i.e., the MCLs adopted by EPA) in order to “preserve and protect the quality of those waters for all present and reasonably foreseeable future uses” (i.e., as a drinking water source) (ARS § 49-221.A.) • All three WGFS proposed alternative remedies cease any treatment after 2025, according to the assertions in the WGFS,¹² regardless if applicable Arizona water quality standards (for protection of “public health and welfare and the environment” or for an aquifer classified as a drinking water aquifer) have not been achieved, “public health and welfare and environmental” risks remain, or the contamination associated with the WVBA WQARF Site prohibits or limits any “reasonably foreseeable future uses” of the aquifer.
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¹⁰ “Factoring this regional pumping [from RID’s wells] and potential future changes to regional pumping into the FS remedial alternatives is necessary and critical.” (WGFS, 19). However, the RID wells that are “necessary and critical” to each WGFS proposed alternative remedy are not treated to address the risks posed to “public health and welfare and the environment” by the contaminated groundwater or included in the cost estimate of the WGFS alternatives.

¹¹ North Indian Bend Wash Superfund Site, Motorola 52nd Street Superfund Site, Phoenix-Goodyear Airport Superfund Site, 56th Street and Earl WQARF Site, and the West Central Phoenix WQARF Site.

¹² Based on the false assertions in the WGFS that RID wells cease operating in 2025, the one or two new smaller extraction wells proposed in all three WGFS alternative remedies will cease operating in 2025 “based on the assumption that the efficacy of the new extraction well primarily depends on operating alongside the current RID pumping regime.” (WGFS, 49 and 54) Similarly, the Less Aggressive Remedy relies solely on RID’s wells for any benefit, which the Working Group inaccurately claims will cease pumping in 2025.

		<p>Failure of all three WGFS proposed alternative remedies to “assure protection of public health and welfare and the environment” is sufficient evidence that all three WGFS proposed alternative remedies fail to meet Arizona’s mandatory WQARF requirement No. 1</p>
<p style="text-align: center;">MEETS WQARF REQUIREMENT No. 2</p> <p>All four RID proposed alternative remedies include remedial strategies and measures commonly utilized at other similarly contaminated Arizona sites that “provide for the control, management [and] cleanup of the hazardous substances in order to allow the maximum beneficial use of the waters of the state.”</p> <ul style="list-style-type: none"> All four RID proposed alternative remedies will “control, manage [and] cleanup the hazardous substances in order to allow the maximum beneficial use of the waters of the state” by physically containing, controlling and removing the contaminants to “preserve, protect and restore” the quality of the aquifer in the WVBA WQARF Site to its Arizona drinking water protected use classification and by utilizing preferred and proven technologies to treat the extracted groundwater to applicable Arizona drinking water MCLs for its “reasonably foreseeable use” as a drinking water source. All four RID proposed alternative remedies will return a significant groundwater supply to its “maximum beneficial use” as a drinking water source, which has been demonstrated as “practicable” at the Motorola 52nd Street Superfund Site directly adjacent to the WVBA WQARF Site. 	<p>2. To the extent practicable, provide for the control, management or cleanup of the hazardous substances in order to allow the maximum beneficial use of the waters of the state. (ARS § 49-282.06.A.2)</p> <ul style="list-style-type: none"> “The department shall ... promote the restoration and reclamation of degraded or despoiled areas and natural resources.” (ARS § 49-104.A.13) “The director shall adopt, by rule, water quality standards for...all waters in all aquifers to preserve and protect the quality of those waters for all present and reasonably foreseeable future uses.”¹³ (ARS § 49-221.A) “All aquifers in this state...shall be classified for drinking water protected use.” (ARS § 49-224.B) “Remedial actions will be in place for as long as need for the water exists, the resource remains available and the contamination associated with the WVBA WQARF Site prohibits or limits groundwater use.” (ADEQ, Remedial Objectives Report, WVBA WQARF Registry Site, 3-3 (August 2012)) 	<p style="text-align: center;">FAILS WQARF REQUIREMENT No. 2</p> <p>All three WGFS proposed alternative remedies fail “to the extent practicable” to “provide for the control, management or cleanup of the hazardous substances in order to allow the maximum beneficial use of the waters of the state.”</p> <ul style="list-style-type: none"> All three WGFS proposed alternative remedies fail to include remedial strategies and measures commonly utilized at other similarly contaminated Arizona sites to “control, manage or cleanup the hazardous substances in order to allow the maximum beneficial use of the waters of the state.” <ul style="list-style-type: none"> All three WGFS proposed alternative remedies fail to include any physical contaminant, controlled migration, plume remediation or treatment strategies or measures in order to “preserve, protect or restore” the quality of the aquifer in the WVBA WQARF Site to its Arizona drinking water protected use classification or to “preserve, protect or restore” the quality of the extracted groundwater to applicable Arizona drinking water MCLs for its “reasonably foreseeable use” as a drinking water source. All three WGFS proposed alternative remedies cease any “control, management or cleanup” of

¹³ Arizona has determined that “reasonability foreseeable uses of water are those likely to occur within 100 years unless a longer time period is shown to be reasonable.” AAC R18-16-406.D.

<ul style="list-style-type: none"> • All four RID proposed alternative remedies not only address the contaminated groundwater in the WVBA WQARF Site to meet both the applicable Arizona aquifer water quality standards for aquifer classification and protection purposes and the applicable Arizona drinking water standards (<i>i.e.</i>, the MCLs) for human consumption purposes which will “allow the maximum beneficial uses of the waters of the state”, as required by state law, but they also address the exposure and health risks posed to the community by the transfer of contaminants from one environmental media (the groundwater) to another (the air). • All four RID proposed alternative remedies employ remedial strategies and measures to remove and treat contaminated groundwater that “will be in place for as long as need for the water exists, the resource remains available and the contamination associated with the WVBA WQARF site prohibits or limits groundwater uses.” 		<p>the hazardous substances after 2025, according to the assertions in the WGFS,¹⁴ regardless if applicable cleanup standards have not been achieved, public health and welfare and environmental risks remain, or the contamination associated with the WVBA WQARF Site prohibits or limits the “reasonably foreseeable future uses” of the groundwater.¹⁵</p> <ul style="list-style-type: none"> ○ All three WGFS proposed alternative remedies leave elevated concentrations of hazardous substances in the form of known carcinogens in the WVBA WQARF Site groundwater that after 2025, according to the assertions in the WGFS, will be allowed to migrate uncontrolled downgradient “towards the regional pumping depression known as the Luke Sink, near the Luke Air Force Base” (WGFS, 7) and contaminate additional groundwater resources, adversely affecting the future beneficial uses of such waters of the state. <p>Failure of all three WGFS proposed alternative remedies, “to the extent practicable, [to] provide for the control, management or cleanup of the hazardous substances in order to allow the maximum beneficial use of the waters of the state” is sufficient evidence that all three WGFS proposed alternative remedies fail to meet Arizona’s mandatory WQARF requirement No 2.</p>
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¹⁴ Based on the false assertions in the WGFS that RID wells cease operating in 2025, the one or two new smaller extraction wells proposed in all three WGFS alternative remedies will cease operating in 2025 “based on the assumption that the efficacy of the new extraction well primarily depends on operating alongside the current RID pumping regime.” WGFS, 49 and 54. Similarly, the Less Aggressive Remedy relies solely on RID’s wells for any benefit, which the Working Group inaccurately claims will cease pumping in 2025.

¹⁵ According to EPA, there is “a preference for remedies that employ treatment that permanently and significantly reduce the mobility, toxicity, or volume of hazardous substances as a principal element. Emphasis is placed on destruction or detoxification of hazardous materials rather than on protection strictly through prevention of exposure,” as proposed in all three WGFS alternative remedies. EPA, *Guidance on Remedial Actions for Contaminated Ground Water at Superfund Sites*, 2-2 (December 1988).

<p style="text-align: center;">MEETS WQARF REQUIREMENT No. 3</p> <p>All four RID proposed alternative remedies are “reasonable, necessary, cost-effective and technically feasible” when and as compared to all other existing major groundwater cleanup sites in Arizona.</p> <ul style="list-style-type: none"> Each RID proposed alternative remedy is “reasonable, necessary, ... and technically feasible” since it utilizes proven and preferred state-of-the-art “pump and treat” (with granular activated carbon) technology to remove and treat elevated concentrations of hazardous VOCs in the groundwater that are known and suspected carcinogens and to prohibit the hazardous VOCs being transferred from groundwater to air, consistent with applicable Arizona and federal standards and policies.¹⁶ Each RID proposed alternative remedy utilizes existing water infrastructure and established end uses to derive a very “reasonable” and “cost-effective solution” compared to all other existing major groundwater cleanup sites in Arizona.¹⁷ ADEQ already has determined that similar remedial actions, submitted by RID to achieve the same cleanup standards but generally larger in scope than the RID proposed alternative remedies, were “reasonable, necessary, cost-effective and 	<p>3. Be reasonable, necessary, cost-effective and technically feasible. (ARS § 49-282.06.A.3)</p>	<p style="text-align: center;">FAILS WQARF REQUIREMENT No. 3</p> <p>All three WGFS proposed alternative remedies fail to satisfy this WQARF “comparative” requirement because, as noted above and below, all three WGFS proposed alternative remedies fail to meet the other mandatory and “substantive” WQARF requirements (Nos. 1, 2, 4 and 5) to enable an apples-to-apples comparison.</p> <ul style="list-style-type: none"> All three WGFS proposed alternative remedies also fail to include the costs to operate and maintain the RID wells that are factored “into the [WG]FS remedial alternatives [as] necessary and critical.” (WGFS, 19).¹⁸ The WGFS Report, in fact, acknowledges that “the relative cost of any potential additional benefit” is a disadvantage for both the proposed Reference Remedy and More Aggressive Remedy, which cease to operate after 2025, according to the assertions in the WGFS (WGFS, 53 and 57), making them less “reasonable, necessary, or cost-effective” as compared to RID’s proposed alternative remedies. <p>Failure of all three WGFS proposed alternative remedies to meet the other mandatory and substantive WQARF requirements by not incorporating the previous ADEQ-approved “reasonable, necessary, cost-effective and</p>
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¹⁶ Letter from Amanda Stone to Keith Takata (November 14, 2007). See also “A remedy that achieves an acceptable risk level in one medium may not be preferred if it only achieves this level by transferring contaminants to another medium.” *Guidance on Remedial Actions*, 4-9. “Regions should ensure that cleanup levels established to restore groundwater to beneficial use, consistent with the NCP (e.g., restoration to MCLs for current or potential drinking water aquifers), also adequately address other routes of exposure associated with the groundwater, including groundwater as a source of contamination to other media.” *Summary of Key Existing EPA CERCLA Policies for Groundwater Restoration*, 9 (June 26, 2009).

¹⁷ See Table 3.

¹⁸ “Factoring this regional pumping [from RID’s wells] and potential future changes to regional pumping into the FS remedial alternatives is necessary and critical.” (WGFS, 19). However, the RID wells that are “necessary and critical” to each WGFS proposed alternative remedy are not treated to address the risks posed to “public health and welfare and the environment” by the contaminated groundwater or included in the cost estimate of the WGFS alternatives.

<p>technically feasible” and consistent with A.R.S. § 49-282.06.A within the WVBA WQARF Site.¹⁹</p> <ul style="list-style-type: none"> Each RID proposed alternative remedy is “necessary” as a matter of Arizona law in order to “protect or provide a water supply” at any RID well within the WVBA WQARF Site that either is “threatened”²⁰ by the groundwater contamination or “would not be fit for its current or reasonably foreseeable end uses [<i>i.e.</i>, as a drinking water source as established by the Remedial Objectives for the WVBA WQARF Site] without treatment due to the release of hazardous substances”²¹ 		<p>technically practicable” remedial actions for the WVBA WQARF Site¹⁹ and the WGFS Report admission that the WGFS costs are excessive compared to the overall effectiveness of the RID proposed alternative remedies is sufficient evidence that all three WGFS proposed alternative remedies fail to meet Arizona’s mandatory WQARF requirement No. 3.</p>
<p style="text-align: center;">MEETS WQARF REQUIREMENT No. 4</p> <p>All four RID proposed alternative remedies address any existing well in the WVBA WQARF Site that “would now or in the reasonably foreseeable future produce water that would not be fit for its current or reasonably foreseeable end uses [<i>i.e.</i>, as a drinking water source] without treatment due to the release of hazardous substances.”</p> <ul style="list-style-type: none"> ADEQ has established the “reasonably foreseeable end use” for the groundwater in the WVBA WQARF Site as a drinking water source in its Remedial Objectives Report for the WVBA WQARF Site²² and ADEQ’s Land and Water Survey for the WVBA WQARF Site.²³ 	<p>4. For remediation of waters of the state, the <u>selected remedial action shall address, at a minimum, any well that at the time of selection of the remedial action either supplies water for municipal, domestic, industrial, irrigation or agricultural uses or is part of a public water system if the well would now or in the reasonably foreseeable future produce water that would not be fit for its current or reasonably foreseeable end uses²⁴ without treatment due to the release of hazardous substances.</u> The specific measures to address any such well shall not reduce the supply of water available to the owner of the well. (ARS § 49-282.06.B.4.b)</p>	<p style="text-align: center;">FAILS WQARF REQUIREMENT No. 4</p> <p>All three WGFS proposed alternative remedies fail to address, <i>at a minimum</i>, the RID water supply wells impacted by groundwater contamination above the applicable numeric and narrative Arizona aquifer water quality standards and the applicable Remedial Objectives established for the WVBA WQARF Site that ADEQ has determined “may present an imminent and substantial endangerment to the public health, welfare or the environment within the [WVBA] WQARF Site.”²⁵</p> <ul style="list-style-type: none"> The failure of all three WGFS proposed alternative remedies to address such impacted RID wells is contrary to the findings in the WGFS Report that each RID well within the WVBA WQARF Site, at the

¹⁹ See ADEQ, Approval of RID’s Early Response Action (June 24, 2010); ADEQ, Approval of RID’s Modified Early Response Action (February 1, 2013); ADEQ, Approval of RID’s Request for ADEQ Reimbursement for Incurred Costs in FY2013 (August 16, 2013); ADEQ, Approval of RID’s Request for ADEQ Reimbursement for Incurred Costs in FY2014 (July 21, 2014).

²⁰ Cite R18-16-405.I, included text.

²¹ ARS § 49-282.06.B.4.b.

²² See ADEQ, Remedial Objectives Report, West Van Buren Area WQARF Registry Site, Phoenix, Arizona, 3-3 (August 8, 2012).

²³ http://www.azdeg.gov/environ/waste/sps/download/wvb/apps/app_k.pdf.

²⁴ Arizona has determined that “reasonably foreseeable uses of water are those likely to occur within 100 years unless a longer time period is shown to be reasonable.” AAC R18-16-406.D.

²⁵ Agreement to Conduct Work between ADEQ and RID, dated October 8, 2009.

		<p>time of the selection of the remedy, “supplies water for irrigation”²⁶ and that the RID wells within the WVBA WQARF Site “would now or in the reasonably foreseeable future produce water that would not be fit for its ... reasonably foreseeable end uses without treatment due to the release of hazardous substances.”²⁷</p> <ul style="list-style-type: none"> • All three WGFS proposed alternative remedies include future measures to address all threatened, but not yet impacted, City of Tolleson, City of Phoenix, Salt River Project and private wells, but fail to address, as required by this mandatory requirement, the existing RID water supply wells that are currently impacted above the applicable Arizona numeric and narrative aquifer water quality standards, the Remedial Objectives established for the WVBA WQARF Site, and the reasonably foreseeable end uses established by ADEQ’s Land and Water Survey for the WVBA WQARF Site. <p>Failure of all three WGFS proposed alternative remedies to address, at a minimum, the existing RID water supply wells impacted by the groundwater contamination above the applicable Arizona numeric and narrative aquifer water quality standards, the Remedial Objectives established for the WVBA WQARF Site, and the reasonably foreseeable end uses established by ADEQ’s Land and Water Survey for the WVBA WQARF Site is sufficient evidence that all three WGFS proposed alternative remedies fail to meet Arizona’s mandatory WQARF requirement No. 4.</p>
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²⁶ “RID has approximately 32 irrigation wells located within or adjacent to the WVBA. Although those wells are presently used exclusively for irrigation, RID’s water provider plan states that RID may seek to pump those wells to supply drinking water.” (WGFS, 38)

²⁷ The WGFS acknowledges that the WVBA COCs are currently above the AWQS and would require treatment before the water could be pumped for its reasonable foreseeable water end use as a drinking water supply: “If the COP is required to pump the UAU aquifer in the WVBA in the future prior to the time COCs have been reduced to AWQS, then a contingent measure such as well-head treatment ... may be appropriate.” (WGFS, 41)

MEETS WQARF REQUIREMENT No. 5

All four RID proposed alternative remedies will “protect, restore, replace or otherwise provide a water supply” for all well owners within or adjacent to the WVBA WQARF Site whose “current and reasonably foreseeable future uses are impaired or lost due to contamination from the site,” including a drinking water source as established by applicable Arizona law, the Remedial Objectives for the WVBA WQARF Site, and the reasonably foreseeable end uses established by ADEQ’s Land and Water Survey for the WVBA WQARF Site.

- All four RID proposed alternative remedies will achieve all Remedial Objectives for the WVBA WQARF Site by including remedial strategies and measures that will control further migration of the plume, contain the plume within its current boundaries and remove and treat the contaminants “to protect, restore, replace or otherwise provide a water supply...if the current and reasonably foreseeable future uses [including a drinking water source] are impaired or lost due to contamination from the site.”
- All four RID proposed alternative remedies “shall remain in effect as long as required to ensure the continued achievement of those [remedial] objectives.”

5. The reference remedy and alternative remedies shall be capable of achieving all of the remedial objectives. (AAC R18-16-407.E.1)

- ADEQ has established the following mandatory Remedial Objective for the WVBA WQARF Site: “To protect, restore, replace or otherwise provide a water supply for municipal use by currently and reasonably foreseeable future municipal well owners within the WVBA WQARF Site if the current and reasonably foreseeable future uses are impaired or lost due to contamination from the site. Remedial actions will be in place for as long as need for the water exists, the resource remains available and the contamination associated with the WVBA WQARF Site prohibits or limits groundwater use.” (ADEQ, Remedial Objectives Report, WVBA WQARF Registry Site, 3-3 (August 2012))
- “Where remedial measures are relied upon to achieve Remedial Objectives, such remedial measures shall remain in effect as long as required to ensure the continued achievement of those objectives.” (AAC R18-16-407.G).
- ADEQ acknowledges that RID constitutes a “reasonably foreseeable future municipal well owner[] within the WVBA WQAR Site.” (ADEQ, Remedial Objectives Report, WVBA WQARF Registry Site, 3-3 (August 2012))

FAILS WQARF REQUIREMENT No. 5

All three WGFS proposed alternative remedies fail to include remedial strategies or measures that will “protect, restore, replace or otherwise provide a [drinking] water supply” for RID’s existing water supply wells that “are impaired or lost due to contamination from the [WVBA] site” based on the groundwater contamination that currently impacts 14 RID wells above the applicable Arizona numeric and narrative aquifer water quality standards, the Remedial Objectives for the WVBA WQARF Site, and the reasonably foreseeable end uses established by ADEQ’s Land and Water Survey for the WVBA WQARF Site.

- Also, each WGFS proposed alternative remedy after 2025, according to the assertions in the WGFS, would allow for the uncontrolled downgradient migration of the hazardous substances “towards the regional pumping depression known as the Luke Sink, near the Luke Air Force Base” (WGFS, 7) that could threaten and impact additional groundwater resources and other existing water supply wells, and thereby impair “reasonably foreseeable future uses.”
- All three WGFS proposed alternative remedies cease any treatment after 2025, according to the assertions in the WGFS, regardless if all the Remedial Objectives and cleanup standards (for “protection of public health and welfare and the environment” or for an aquifer classified as a drinking water aquifer) have not been achieved, “public health and welfare and environmental” risks remain, or the contamination associated with the WVBA WQARF Site prohibits or limits present or reasonably foreseeable future groundwater uses.

		<p>Failure of all three WGFS proposed alternative remedies “to protect, restore, replace or otherwise provide a [drinking] water supply” for RID’s existing water supply wells that “are impaired or lost to [groundwater] contamination from the [WVBA] site” is sufficient evidence that all three WGFS proposed alternative remedies fail to meet Arizona’s mandatory WQARF requirement No. 5.</p>
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ATTACHMENT 4

Five CERCLA Requirements¹ that Must be Addressed Specifically during Remedy Selection and Must be Discussed in any EPA Record of Decision

Roosevelt Irrigation District's (RID) FS Report ²	CERCLA Requirements ⁴	Working Group's FS (WGFS) Report ⁵
<p style="text-align: center;">MEETS CERCLA REQUIREMENT No. 1</p> <p>All four RID proposed alternative remedies “eliminate, reduce, or control risks to human health and the environment” posed by the hazardous substances present in the groundwater within the WVBA WQARF Site.</p> <ul style="list-style-type: none"> All four RID proposed alternative remedies “eliminate, reduce or control” the risks posed to the community from the contaminated groundwater by the “significant volatilization and transfer of contaminants from the water into the air,”³ and the risks posed to the environment by continued contaminant migration resulting in 	<p>1. Protect human health and the environment (CERCLA Section 121(b))</p> <ul style="list-style-type: none"> “The purpose of the remedy selection process is to implement remedies that <u>eliminate, reduce, or control risks to human health and the environment.</u>” (NCP, 40 CFR § 300.430(a)(1)). “Alternatives shall be developed that <u>protect human health and the environment by recycling waste or by eliminating, reducing and/or controlling risks posed through each pathway by</u> 	<p style="text-align: center;">FAILS CERCLA REQUIREMENT No. 1</p> <p>All three WGFS proposed alternative remedies fail to “eliminate, reduce, or control risks to human health and the environment” posed by the hazardous substances present in the groundwater within the WVBA WQARF Site.</p> <ul style="list-style-type: none"> All three WGFS proposed alternative remedies fail to address the risks posed to the community from the contaminated groundwater by the “significant volatilization and transfer of contaminants from the water into the air,”³ or the risks posed to the environment by continued contaminant migration resulting in contamination of additional

¹ EPA, *Guidance on Remedial Actions for Contaminated Ground Water at Superfund Sites*, 2-1 (December 1988) (noting that this guidance “has been prepared on the basis of CERCLA as amended by SARA [the Superfund Amendments and Reauthorization Act] and the existing NCP [National Contingency Plan] and is consistent with the proposed NCP and directives issued by the Office of Solid Waste and Emergency Response.”).

² RID is an irrigation district operating in Arizona since 1923 with 32 wells located within or adjacent to the West Van Buren Area (WVBA) Water Quality Assurance Revolving Fund (WQARF) Site, 14 of which are contaminated by hazardous volatile organic compounds (VOC) in the groundwater above Arizona aquifer water quality standards and Arizona drinking water standards, the remaining RID wells are threatened by the groundwater contamination. The RID Feasibility Study Report can be found on ADEQ’s website at http://www.azdeq.gov/enviro/waste/sps/download/wvb/2014-07%20Draft%20RID%20FS_1.pdf.

³ ADEQ, Approval of RID’s Modified Early Response Action (February 1, 2013).

⁴ The CERCLA requirements are applicable or relevant and appropriate to cleanups under the Arizona WQARF Program. First, Arizona law mandates that “in setting [water quality standards for all waters in all aquifers], the director shall consider, but not be limited to, ... guidelines, action levels or numerical criteria adopted or recommended by the United States environmental protection agency or any other federal agency.” (ARS § 49-221.C) Arizona law also authorizes, “the director [of ADEQ] may adopt CERCLA rules, guidelines or procedures by reference to the extent consistent with this article.” (ARS § 49-282.06.B) Additionally, the WQARF Program is “Arizona’s version of the federal ‘superfund’ program” and was “modeled on the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), the federal superfund statute.” Ariz. Admin. Register at 1492 (2002). More importantly, the WVBA WQARF Site is directly downgradient of the Motorola 52nd Street federal Superfund Site from which contaminated groundwater enters the WVBA Site. As a result, failure of a WQARF cleanup to substantially comply with CERCLA requirements could provide EPA the opportunity to overfile, as it did on the East Washington WQARF Site, and take over control of the WVBA WQARF Site, which will delay cleanup of the WVBA WQARF Site and may impose additional cleanup requirements at substantial cost.

⁵ The Working Group’s Feasibility Study Report can be found on ADEQ’s website at: <http://www.azdeq.gov/enviro/waste/sps/download/wvb/2014-07%20Draft%20WVVBWG%20FS.pdf>.

<p>contamination of additional groundwater resources.</p> <ul style="list-style-type: none"> Each RID proposed alternative remedy will “eliminate” by removal and treatment more than 2,500 pounds per year of hazardous substances (<i>i.e.</i>, volatile organic compounds (VOCs) that are known and suspected carcinogens) that would otherwise volatilize and transfer from the water into the air in the community, or remain and continue to migrate in the groundwater, resulting in contamination of additional groundwater resources. <p>All four RID proposed alternative remedies will “protect human health and the environment by restoring ground water to its beneficial uses within a reasonable time frame” and provide “especially long-term effectiveness and performance, short-term effectiveness, and compliance with ARARs [applicable or relevant and appropriate requirements under federal or state laws].”</p> <ul style="list-style-type: none"> Each RID proposed alternative remedy will remove and treat hazardous substances present in the 	<p><u>a site.”</u> (NCP, 40 CFR § 300.430(e)(2)).⁶</p> <ul style="list-style-type: none"> “The goal of Superfund ground-water remediation is to <u>protect human health and the environment by restoring ground water to its beneficial uses⁶ within a reasonable time frame.”⁷</u> “Remediation goals shall <u>establish acceptable exposure levels that are protective of human health and the environment and shall be developed by considering the following: applicable or relevant and appropriate requirements [(ARARs)]⁷ under federal or state environmental or facility siting laws ... [and] the MCL⁸ [maximum contaminant level] promulgated for that contaminant ... shall be attained by remedial actions for ground or surface waters that are current or potential sources of drinking water.”</u> (NCP, 40 CFR § 300.430(e)(2)(i)(A) and (C)) “Overall protection of human health and the environment draws on the assessments of other evaluation criteria, <u>especially long-term effectiveness and permanence, short-term</u> 	<p>groundwater resources.”</p> <ul style="list-style-type: none"> All three WGFS proposed alternative remedies fail to comply with applicable EPA and ADEQ policies and guidance prohibiting “the relocation of contaminants from one media (groundwater) to another (air).”⁹ According to the assertions in the WGFS, after 2025, all three WGFS proposed alternative remedies cease any measures to control contaminant migration, to achieve plume containment or remediation, or to treat groundwater contamination.¹⁰ <p>All three WGFS proposed alternative remedies fail to “protect human health and the environment by restoring ground water to its beneficial uses within a reasonable time frame” or to provide “especially long-term effectiveness and performance, short-term effectiveness, and compliance with ARARs.”</p> <ul style="list-style-type: none"> According to the WGFS Report, “the WVBA regional plume is too large, however, for full plume remediation.” (WGFS, 24). However, in an
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⁶ “A remedy that achieves an acceptable risk level in one medium may not be preferred if it only achieves this level by transferring contaminants to another medium.” *Guidance on Remedial Actions*, 4-9. “Regions should ensure that cleanup levels established to restore groundwater to beneficial use, consistent with the NCP (e.g., restoration to MCLs for current or potential drinking water aquifers), also adequately address other routes of exposure associated with the groundwater, including groundwater as a source of contamination to other media.” *Summary of Key Existing EPA CERCLA Policies for Groundwater Restoration*, 9 (June 26, 2009). See also Letter from Amanda Stone to Keith Takata (November 14, 2007).

⁷ “Chemical-specific standards that define acceptable risk levels (e.g., non-zero MCLGs, MCLs) also may be used to determine whether an exposure is associated with an unacceptable risk to human health or the environment.” EPA, *Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions* (OSWER Directive 9355.0-30, April 22, 1991).

⁸ “Superfund groundwater remedies for existing or potential sources of drinking water should reduce concentrations to existing MCLs or to more stringent State standards.” *Guidance on Remedial Actions*, 2-8. “Although MCLs are developed using cost and technical considerations, they are also protective of human health.” *Id.* at 2-9.

⁹ “A remedy that achieves an acceptable risk level in one medium may not be preferred if it only achieves this level by transferring contaminants to another medium.” *Guidance on Remedial Actions*, 4-9. “Regions should ensure that cleanup levels established to restore groundwater to beneficial use, consistent with the NCP (e.g., restoration to MCLs for current or potential drinking water aquifers), also adequately address other routes of exposure associated with the groundwater, including groundwater as a source of contamination to other media.” *Summary of Key Existing EPA CERCLA Policies for Groundwater Restoration*, 9 (June 26, 2009). See also Letter from Amanda Stone to Keith Takata (November 14, 2007).

¹⁰ “Remedial actions should be designed to prevent, as quickly as possible and to the extent practicable, further spread of a plume in these complex systems.” *Guidance on Remedial Actions*, 5-4

groundwater to applicable Arizona and federal maximum contaminant levels (MCLs) in order to restore the aquifer to its reasonably foreseeable beneficial use (as a drinking water source¹¹) within a reasonable time¹² and to protect human health and the environment from unacceptable “exposure levels.”

- The RID wellhead treatment pilot project performed at four highly-contaminated RID wells in the WVBA WQARF Site, as agreed to by ADEQ, has demonstrated that removal and granular-activated-carbon (GAC) treatment of the existing groundwater contaminants can achieve short- and long-term effectiveness that will comply with Arizona and federal ARARs.

All four RID proposed alternative remedies will achieve “acceptable exposure levels that are protective of human health and the environment” as established by Arizona and federal ARARs and the MCLs.

- Consistent with other Phoenix-area Superfund and WQARF Sites, each RID proposed alternative remedy will treat contaminated groundwater extracted from the WVBA WQARF Site¹³ (with concentrations up to 75 ppb for TCE, a known carcinogen with an ARAR and MCL of 5 ppb) to “acceptable exposure levels that are protective of human health and the environment” (*i.e.*, to

effectiveness, and compliance with ARARs.” (NCP, 40 CFR § 300.430(e)(9)(iii)(A)).

- “Alternatives shall be assessed to determine whether they can adequately protect human health and the environment, in both the short- and long-term, from unacceptable risks posed by hazardous substances, pollutants, or contaminants present at the site by eliminating, reducing, or controlling exposures to levels established during development of remediation goals. (NCP, 40 CFR § 300.430(e)(9)(iii)(A)).
- “Alternatives that do not provide adequate protection of human health and the environment shall be eliminated from further consideration.” (NCP, 40 CFR § 300.430(e)(7)(i)).

apparent contradiction of that statement, the WGFS Report acknowledges that removal and granular-activated-carbon (GAC) treatment of contaminated groundwater to drinking water standards at the Motorola 52nd Street federal Superfund Site directly upgradient of the WVBA WQARF Site has resulted in “significant declines in VOC concentrations ... in some cases by an order of magnitude or more” along with “an overall narrowing of the plume width” within a relatively short period of current groundwater pumping. (WGFS, 20)

- According to the WGFS Report, only two WGFS proposed alternative remedies provide any “localized remediation,” but those only include one or two new smaller wells that “would cease operating at the end of 2025.” (WGFS, 49 and 54).

All three WGFS proposed alternative remedies fail to meet “acceptable exposure levels that are protective of human health and the environment” as established by Arizona and federal ARARs and the MCLs.

- All three WGFS proposed alternative remedies fail to treat all contaminated groundwater extracted from the WVBA WQARF Site¹³ (with concentrations up to 75 ppb for TCE, a known carcinogen with an ARAR and MCL of 5 ppb), as

¹¹ Arizona’s law defines “reasonably foreseeable uses of water” as “those likely to occur within 100 years unless a longer time period is shown to be reasonable. Arizona law also requires “all aquifers in this state...shall be classified for drinking water protected use...(ARS § 49-224.B) and “primary drinking water maximum contaminant levels [MCLs] established by the [EPA] administrator...are adopted as drinking water aquifer water quality standards...” (ARS § 49-223.A)

¹² *Guidance on Remedial Actions*, 1-1. EPA identifies “a reasonable time frame” as being “less than 100 years.” *Id.* at 5-8. “A rapid remedial alternative generally should be developed for groundwater that is a current or potential source of drinking water. This alternative should achieve the selected cleanup level throughout the area of attainment within the shortest time technically feasible.” *Id.* at 5-9.

¹³ “Factoring this regional pumping [from RID’s wells] and potential future changes to regional pumping into the FS remedial alternatives is necessary and critical.” (WGFS, 19). However, the RID wells that are “necessary and critical” to each WGFS proposed alternative remedies are not treated to address the risks to “public health and welfare and the environment” posed by the contaminated groundwater or included in the cost estimate of the WGFS alternatives.

<p>applicable Arizona and federal ARARs and the MCLs).</p> <ul style="list-style-type: none"> Each RID proposed alternative remedy will provide for removal and treatment of the contaminated groundwater to ensure compliance with Arizona’s aquifer water quality standards and federal ARARs (<i>i.e.</i>, MCLs)¹⁴ in order to “preserve and protect the quality of those waters for all present and reasonably foreseeable future uses” (<i>i.e.</i>, as a drinking water source). (ARS § 49-221.A; § 49-224.B) 		<p>treated at all other Phoenix-area Superfund and WQARF Sites.¹⁵</p> <ul style="list-style-type: none"> All three WGFS proposed alternative remedies fail to meet applicable Arizona water quality standards and federal ARARs for “all waters in all aquifers to preserve and protect the quality of those waters for all present and reasonably foreseeable future uses.”¹⁶ (ARS § 49-221.A) Arizona state law has determined that the “primary drinking water maximum contaminant levels [MCLs] established by the [EPA] administrator ...are adopted as drinking water aquifer water quality standards” (ARS § 49-223.A) and, therefore, are federal ARARs at the WVBA WQARF Site. <p>Failure of all three WGFS proposed alternative remedies to “provide adequate protection of human health and the environment” is sufficient evidence that all three WGFS proposed alternative remedies “shall be eliminated from further consideration.”</p>
<p style="text-align: center;">MEETS CERCLA REQUIREMENT No. 2</p> <p>All four RID proposed alternative remedies treat all extracted contaminated groundwater to attain “acceptable exposure levels” established by Arizona and federal ARARs, which include the MCL of 5 ppb for the known carcinogen TCE.</p> <ul style="list-style-type: none"> All four RID proposed alternative remedies attain the same “acceptable exposure levels” (<i>i.e.</i>, groundwater restoration to MCLs, treatment to MCLs for reasonably foreseeable end use as a drinking water source, and prohibition of the transfer of contaminants from groundwater into air) as required by Arizona and federal ARARs at 	<p>2. Attain the applicable or relevant and appropriate requirements (ARARs) of Federal and State laws (CERCLA Section 121(d)(2)(A)).</p> <ul style="list-style-type: none"> “Maximum contaminant level goals ... that are set above zero” or the “<u>maximum contaminant level [MCL] shall be attained where relevant and appropriate.</u>” (NCP, 40 CFR § 300.430(3)(B) and (C). The “<u>effectiveness</u>” criterion “<u>focuses on the degree to which an alternative ... complies with ARARs. ... Alternatives providing significantly less effectiveness</u> than other, more promising 	<p style="text-align: center;">FAILS CERCLA REQUIREMENT No. 2</p> <p>All three WGFS proposed alternative remedies fail to treat all extracted contaminated groundwater to attain “acceptable exposure levels” established by Arizona and federal ARARs, which include the MCL of 5 ppb for the known carcinogen TCE, unlike the other groundwater remedies in Scottsdale, Goodyear, East Phoenix and elsewhere in the State.</p> <ul style="list-style-type: none"> As noted above, all three WGFS proposed alternative remedies fail to attain water quality ARARs established under Arizona’s groundwater classification system that “all aquifers in this state ... shall be classified for drinking water protected

¹⁴ See ARS § 49-223.A.

¹⁵ North Indian Bend Wash Superfund Site, Motorola 52nd Street Superfund Site, Phoenix-Goodyear Airport Superfund Site, 56th Street and Earl WQARF Site, and a West Central Phoenix WQARF Site.

¹⁶ Arizona has determined that “reasonably foreseeable uses of water are those likely to occur within 100 years unless a longer time period is shown to be reasonable.” AAC R18-16-406.D.

the groundwater remedies in Scottsdale, Goodyear, East Phoenix and elsewhere in the State.

- Each RID proposed alternative remedy will allow ADEQ to fulfill its duty¹⁷ and comply with Arizona and federal ARARs to restore the aquifer to meet its drinking-water protected use aquifer classification¹⁸ and to meet the applicable Arizona aquifer water quality standards (*i.e.*, the MCLs “are adopted as [Arizona] drinking water aquifer water quality standards”). (ARS § 49-223.A)
- All four RID proposed alternative remedies comply with Arizona’s legal mandate (and federal ARAR) that, at a minimum, the selected remedy shall address any existing well that is not now or will not be fit for its current or reasonably foreseeable end use¹⁹ (which ADEQ has established as a drinking water source in its Remedial Objectives Report for the WVBA WQARF Site).²⁰
- All four RID proposed alternative remedies comply with Arizona’s Remedial Objectives (and federal ARAR) for the WVBA WQARF Site requiring “remedial actions will be in place for as long as need for the water exists, the resource remains available and the contamination associated with the WQARF Site prohibits or limits groundwater use.”²¹

alternatives may be eliminated.” (NCP, 40 CFR § 300.430(e)(7)(i)).

- “For ground water that is a current or potential source of drinking water ... cleanup levels generally will be based on chemical-specific ARARs [*i.e.*, MCLs] or health-based levels.”²²
- “Some states have developed and promulgated their own ground-water classification systems. A State’s classification system may be used to determine remediation goals. Furthermore, a promulgated State system may be an ARAR.”²³
- “Alternatives that do not meet ARARs ... should be screened out.”²⁴

use.” (ARS § 49-224.B) Arizona has clearly established that the “primary drinking water [MCLs] established by the [EPA] administrator ...are adopted as drinking water aquifer water quality standards” (ARS § 49-223.A) and, therefore, are federal ARARs at the WVBA WQARF Site.

- All three WGFS proposed alternative remedies fail to comply with the federal ARAR established by Arizona state law that mandates “for remediation of waters of the state, the selected remedial action shall address, at a minimum, any well that at the time of selection of the remedial action either supplies water for municipal, domestic, industrial, irrigation or agricultural uses or is part of a public water system if the well would now or in the reasonably foreseeable future produce water that would not be fit for its current or reasonably foreseeable end uses without treatment due to the release of hazardous substances.”¹⁹
- All three WGFS proposed alternative remedies fail to comply with the federal ARAR established by ADEQ in the Remedial Objectives Report for the WVBA WQARF Site that “remedial actions will be in place for as long as need for the water exists, the resource remains available and the contamination associated with the WVBA WQARF site prohibits or limits groundwater use.”²¹

Failure of all three WGFS proposed alternative remedies to “meet ARARs” is sufficient evidence that all three WGFS alternatives “should be screened out.”

¹⁷ Pursuant to Ariz. Rev. Stat. § 49-104.A.13, “the department shall ... promote the restoration and reclamation of degraded or despoiled areas and natural resources.”

¹⁸ See ARS § 49-224.B.

¹⁹ See ARS § 49-282.06.B.4.b.

²⁰ See ADEQ, Remedial Objectives Report, West Van Buren Area WQARF Registry Site, Phoenix, Arizona, 3-3 (August 8, 2012) and ARS § 49-282.06.B.4.b.

²¹ Remedial Objectives Report, 3-3.

²² *Guidance on Remedial Actions*, 4-1.

²³ *Id.* at 2-5.

²⁴ *Id.* at 5-11.

<p style="text-align: center;">MEETS CERCLA REQUIREMENT No. 3</p> <p>All four RID proposed alternative remedies “reflect a cost-effective solution taking into consideration short and long-term costs” when and as compared to all other existing major groundwater cleanup sites in Arizona.²⁵</p> <ul style="list-style-type: none"> • RID’s FS Report includes all costs to operate and maintain the RID proposed alternative remedies until “acceptable exposure levels” established by federal and Arizona ARARs are achieved. • Each RID proposed alternative remedy utilizes existing water infrastructure and established end uses to derive a very “cost-effective solution” compared to all other existing groundwater cleanup sites in Arizona.²⁵ 	<p>3. Reflect a cost-effective solution, taking into consideration short- and long-term costs (CERCLA Section 121(a))</p> <ul style="list-style-type: none"> • “The <u>costs of construction and any long-term costs to operate and maintain the alternatives shall be considered.</u>” (NCP, 40 CFR § 300.430(e)(7)(iii)). • “<u>Costs that are grossly excessive</u> compared to the overall effectiveness of alternatives <u>may be considered as one of several factors used to eliminate alternatives.</u>” (NCP, 40 CFR § 300.430(e)(7)(iii)). 	<p style="text-align: center;">FAILS CERCLA REQUIREMENT No. 3</p> <p>All three WGFS proposed alternative remedies fail to satisfy this comparative CERCLA requirement because, as noted above and below, all three WGFS proposed alternative remedies fail to comply with the other mandatory and substantive CERCLA requirements (Nos. 1, 2, 4 and 5) to enable an apples-to-apples comparison.</p> <ul style="list-style-type: none"> • All three WGFS proposed alternative remedies fail to include the costs to operate and maintain the RID wells that are factored “into the [WG] FS remedial alternatives [as] necessary and critical.” (WGFS, 19). • The WGFS Report also acknowledges that “the relative cost of any potential additional benefit” is a disadvantage for both the proposed Reference Remedy and More Aggressive Remedy, which cease to operate after 2025, according to the assertions in the WGFS Report (WGFS, 53 and 57), making them a less “cost-effective solution” as compared to RID’s proposed alternative remedies. <p>Failure of all three WGFS proposed alternative remedies to “reflect a cost-effective solution” and the WGFS Report admission that the costs are “excessive compared to the overall effectiveness” of the RID proposed alternative remedies is sufficient evidence that all three WGFS alternatives should be eliminated.</p>
<p style="text-align: center;">MEETS CERCLA REQUIREMENT No. 4</p> <p>All four RID proposed alternative remedies incorporate “permanent solutions and treatment technologies” (utilized and proven at other similarly contaminated Arizona sites) to remove the elevated concentrations of known and suspected carcinogens</p>	<p>4. Use permanent solutions and treatment technologies or resource recovery technologies to the maximum extent practicable (CERCLA Section 121(b))</p> <ul style="list-style-type: none"> • “The national goal of the remedy selection process is to <u>select remedies that are protective</u> 	<p style="text-align: center;">FAILS CERCLA REQUIREMENT No. 4</p> <p>All three WGFS proposed alternative remedies fail to provide “permanent solutions” that are “protective of human health and the environment, that maintain protection over time, and that</p>

²⁵ See Table 3.

in the groundwater, to “minimize untreated waste” being transferred from groundwater to air, and to achieve applicable Arizona and federal ARAR cleanup standards and exposure levels.

- All four RID proposed alternative remedies will be permanently “protective of human health and the environment” by treating the contaminated groundwater to “acceptable exposure levels” (*i.e.*, applicable MCLs) and ensuring that such protection will continue until the applicable cleanup standards are achieved.
- All four RID proposed alternative remedies will return a significant groundwater supply to its “maximum beneficial use” as a drinking source, which has been demonstrated as “practicable” at the Motorola 52nd Street federal Superfund Site directly adjacent to the WVBA WQARF Site.
- All four RID proposed alternative remedies will ensure “long-term effectiveness” by removing and treating the contaminated waters until applicable cleanup standards and exposure levels are achieved to minimize any residual risk to the community or to the environment from “untreated waste.”

- of human health and the environment, that maintain protection over time, and that minimize untreated waste.” (NCP, 40 CFR § 300.430(a)(1)).
- “EPA expects to return usable ground waters to their beneficial uses wherever practicable, within a timeframe that is reasonable given the particular circumstances of the site.” (NCP, 40 CFR § 300.430(a)(1)(iii)(F)).
 - The “effectiveness” criterion “focuses on the degree to which an alternative ... minimizes residual risks and affords long-term protection. ... Alternatives providing significantly less effectiveness than other, more promising alternatives may be eliminated.” (NCP, 40 CFR § 300.430(e)(7)(i)).
 - “Alternatives shall be assessed for the long-term effectiveness and permanence they afford, along with the degree of certainty that the alternative will prove successful. Factors that shall be considered, as appropriate, include the following: (1) Magnitude of residual risk remaining from untreated waste or treatment residuals at the conclusion of the remedial activities ... (2) Adequacy and reliability of controls such as containment systems.” (NCP, 40 CFR § 300.430(e)(9)(iii)(C)).²⁶

minimize untreated waste” to the “maximum extent practicable.”

- As noted above, all three WGFS proposed alternative remedies fail to attain “acceptable exposure levels that are protective of human health and the environment” as established by Arizona and federal ARARs and the MCLs.
- All three WGFS proposed alternative remedies fail to provide “long-term effectiveness and permanence” as any “treatment technologies” cease in 2025,²⁷ according to the assertions in the WGFS, regardless if applicable cleanup standards have not been achieved, public health and environmental risks remain, or the contamination associated with the WVBA WQARF Site prohibits or limits groundwater uses.
- All three WGFS proposed alternative remedies leave elevated concentrations of “untreated waste” in the form of known and suspected carcinogens in the WVBA WQARF Site groundwater that after 2025, according to the assertions in the WGFS, will be “uncontained” and allowed to migrate uncontrolled downgradient “towards the regional pumping depression known as the Luke Sink, near the Luke Air Force Base” (WGFS, 7) and contaminate additional groundwater resources and other existing water supply wells.
- All three WGFS proposed alternative remedies fail to “return usable ground waters to their beneficial uses wherever practicable.”

²⁶ “Remedial actions should be designed to prevent, as quickly as possible and to the extent practicable, further spread of a plume in these complex systems.” *Guidance on Remedial Actions*, 5-4.

²⁷ Based on the false assertions in the WGFS that RID’s wells cease operating in 2025, the one or two new smaller extraction wells proposed in all three WGFS alternative remedies will cease operating in 2025 “based on the assumption that the efficacy of the new extraction well primarily depends on operating alongside the current RID pumping regime.” WGFS, 49 and 54. Similarly, the Less Aggressive Remedy relies solely on RID’s wells for any benefit, which the Working Group inaccurately claims will cease pumping in 2025.

- This is contrary to applicable Arizona and federal ARARs and the removal and treatment of contaminated groundwater to drinking water MCL standards performed at the Motorola 52nd Street federal Superfund Site directly upgradient of the WVBA WQARF Site that the Working Group acknowledges has resulted in “significant declines in VOC concentrations ... in some cases by an order of magnitude or more” along with “an overall narrowing of the plume width” within a relatively short period of current groundwater pumping. (WGFS, 20)
- Contrary to the WGFS Report, treatment of the upper aquifer unit (UAU) to achieve the beneficial uses of that portion of the aquifer that has been “classified for drinking water protected use” (ARS § 49-224.B) is “practicable” given that ADEQ already has approved such treatment as “reasonable, necessary and cost-effective” and consistent with A.R.S. § 49-282.06.A within the WVBA WQARF Site.²⁸

Failure of all three WGFS proposed alternative remedies to “maintain protection over time,” to “return usable ground waters to their beneficial uses” and to “minimize residual risks” as required at other federal Superfund and WQARF sites in Arizona, including ADEQ’s prior early response action approvals for the WVBA WQARF Site, is sufficient evidence that all three WGFS alternatives should be eliminated.

²⁸ See ADEQ, Approval of RID’s Early Response Action (June 24, 2010); ADEQ, Approval of RID’s Modified Early Response Action (February 1, 2013); ADEQ, Approval of RID’s Request for ADEQ Reimbursement for Incurred Costs in FY2013 (August 16, 2013); ADEQ, Approval of RID’s Request for ADEQ Reimbursement for Incurred Costs in FY2014 (July 21, 2014)

MEETS CERCLA REQUIREMENT No. 5

All four RID proposed alternative remedies through groundwater extraction and treatment will “permanently and significantly reduce the mobility, toxicity and volume of hazardous substances” present in the groundwater within the WVBA WQARF Site by utilizing proven and preferred “treatment” technologies that will “permanently” ensure that the remedy is “protective of human health and the environment.”

- “Treatment” is the principal element of each of the four RID proposed alternative remedies in order to address the “principal threats posed” at the WVBA WQARF Site and to “return usable ground waters to their beneficial uses.”
- All four RID proposed alternative remedies not only remove and treat the contaminated groundwater to meet the applicable MCLs, as required by Arizona and federal ARARs, but also address the transfer of contaminants from one environmental media (the groundwater) to another (the air).

5. The preference for remedies that permanently and significantly reduce the mobility, toxicity, or volume of hazardous substances as a principal element or explain why such a remedy was not selected (CERCLA Section 121(b))

“EPA expects to use treatment to address the principal threats posed by a site, wherever practicable. Principal threats for which treatment is most likely to be appropriate include liquids, areas contaminated with high concentrations of toxic compounds, and highly mobile materials.” (NCP, 40 CFR § 300.430(a)(1)(iii)(A)).²⁹

- When balancing trade-offs among alternatives, “the balancing shall emphasize long-term effectiveness and reduction of toxicity, mobility, or volume through treatment. The balance shall also consider the preference for treatment as a principal element.” (NCP, 40 CFR § 300.430(f)(1)(ii)(E)).
- “EPA expects to return usable ground waters to their beneficial uses wherever practicable, within a timeframe that is reasonable given the particular circumstances of the site.” (NCP, 40 CFR § 300.430(a)(1)(iii)(F)).³⁰
- “Regions should ensure that cleanup levels established to restore groundwater to beneficial use, consistent with the NCP (e.g., restoration to

FAILS CERCLA REQUIREMENT No. 5

All three WGFS proposed alternative remedies fail to treat all the extracted contaminated groundwater included in their proposed alternative remedies³¹ (even though elevated concentrations are present up to 75 ppb for a known carcinogen TCE with an ARAR and MCL of 5 ppb), and thereby fail to “permanently and significantly reduce the mobility, toxicity or volume of the hazardous substances” in the WVBA WQARF Site.

- The “preference” for “treatment” is not the “principal element” in the three WGFS proposed alternative remedies. Instead and according to the WGFS Report, the elevated TCE concentrations will be “uncontained” and allowed to transfer to the air of surrounding communities until 2025 and then will be allowed to migrate uncontrolled downgradient “towards the regional pumping depression known as the Luke Sink, near the Luke Air Force Base” (WGFS, 7) and contaminate additional groundwater resources and other existing water supply wells.
- As noted above, all three WGFS proposed alternative remedies cease any “treatment technologies” in 2025,³² according to the assertions in the WGFS, regardless if applicable cleanup standards (for protection of public health

²⁹ “Emphasis is placed on destruction or detoxification of hazardous materials rather than on protection simply through prevention of exposure,” as proposed in the three WGFS alternative remedies. *Guidance on Remedial Actions*, 2-2. “A natural attenuation response action ... should not, however, substitute for active response measures, unless such measures have been determined not to be practicable.” *Id.* at 5-7.

³⁰ The preamble to the NCP states that “remediation levels generally should be attained throughout the contaminated plume.” (55 FR 8754, March 8, 1990)

³¹ “Factoring this regional pumping [from RID’s wells] and potential future changes to regional pumping into the FS remedial alternatives is necessary and critical.” (WGFS, 19). However, the RID wells that are “necessary and critical” to each WGFS proposed alternative remedy are not treated to address the risks posed to human health and the environment by the contaminated groundwater or included in the cost estimates of the WGFS alternatives.

³² Based on the false assertions in the WGFS that RID’s wells cease operating in 2025, the one or two new smaller extraction wells proposed in all three WGFS alternative remedies will cease operating in 2025 “based on the assumption that the efficacy of the new extraction well primarily depends on operating alongside the current RID pumping regime.” WGFS, 49 and 54. Similarly, the Less Aggressive Remedy relies solely on RID’s wells for any benefit, which the Working Group inaccurately claims will cease pumping in 2025.

	<p><u>MCLs for current or potential drinking water aquifers), also adequately address other routes of exposure associated with the groundwater, including groundwater as a source of contamination to other media.”³³</u></p>	<p>and the environment or for an aquifer that is classified as a drinking water aquifer) have not been achieved, public health and environmental risks remain, or the contamination associated with the WVBA WQARF site prohibits or limits groundwater uses.</p> <p>Failure of all three WGFS proposed alternative remedies to treat or control the contaminated groundwater so as not to “permanently and significantly reduce the mobility, toxicity or volume of hazardous substances” in the WVBA WQARF Site is sufficient evidence that all three WGFS alternatives should be eliminated.</p>
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³³ Summary of Key Existing EPA CERCLA Policies for Groundwater Restoration, 9 (June 26, 2009).

ATTACHMENT 5

ATTACHMENT 5

RID Comments on the Identification and Evaluation of Proposed Remedial Alternatives in the WGFS Report

The Working Group's Feasibility Study (WGFS) Report fails to adequately identify and consider remedial alternatives in a coherent and logical manner. Many aspects of their remedial alternatives are unaddressed, distorted, or blatantly misrepresented, such as:

It makes no sense for the WGFS Report to advocate the need for focused plume remediation via extraction and treatment and yet contend it is not necessary to similarly remediate RID wells that would be "operating alongside" the new extraction wells.

- The WGFS Report indicates focused plume core extraction is intended *"to remove dissolved-phase mass in higher VOC concentration areas and help expedite declining VOC concentration trends"*.¹ In this case, the Working Group acknowledges that RID's existing wells would be performing the bulk (*i.e.*, 98%) of the removal since the *"the efficacy of the new extraction primarily depends on operating alongside the current RID pumping regime, with the goal of enhancing the current mass removal within the WVBA."*² Therefore, the WGFS Report recommends expending significant additional costs to drill a new extraction well to pump 500 gpm more than RID's 80,000 gpm (during high demand) simply to remove an additional 70 pounds of TCE compared to over 2,000 pounds removed by RID's existing wells. It is unclear why the broad statement in the WGFS Report that *"[f]or each end use scenario, extracted water would need to be treated to meet AWQS for WVBA COCs"* does not apply to the extracted water from RID's wells that are performing the bulk of the remedial action.
- Although the Working Group has continuously argued that RID wells should not be treated,³ as the WGFS Report again advocates, , the Working group proposes to install identical treatment systems (*"Siemens HP 1220 vessels (or equivalent) in lead-lag configuration"*) at the *"new"* extraction wells included in their Reference Remedy (500 gpm capacity) and in their More Aggressive Remedy (1,000 gpm capacity) that RID has installed on four of the most

¹ WGFS Report, page 25.

² WGFS Report, page 49.

³ See comments from various Working Group members opposing ADEQ's approval of RID's Early Response Action (ERA) and Modified ERA to address the contamination impacting RID's water supply wells, public health, welfare and the environment. <http://www.azdeq.gov/envirom/waste/sps/wvb.html>

highly contaminated RID wells in accordance with RID's ADEQ-approved Modified Early Response Action (ERA).

- The Working Group, in considering the addition of a new extraction well (EW-2), commented that *"approximately 75% of the TCE mass removed per year"*⁴ results from only four wells, those currently being treated by RID under the Modified ERA, which pump (and treat) a total of 8,600 gpm. As stated on page 49 of the WGFS Report, *"Operating EW-2 would increase the plume core extraction from 8,600 gpm to 9,100 gpm and remove an estimated additional 70 pounds of TCE and 4 pounds of PCE ..."* It is important to note that the Working Group proposed remedial alternatives require the four existing RID "plume core" extraction wells that are being treated pursuant to RID's ADEQ-approved Modified ERA and removing approximately 2,000 pounds of COCs annually to be decommissioned,⁵ allowing those contaminants to be released to the environment. Therefore, under the WGFS Report only approximately 74 pounds of toxic COCs will be captured annually while approximately 2,000 more pounds will be released than currently allowed under RID's ADEQ-approved Modified ERA. This is a significant step backwards which RID believes to be unlawful.

The WGFS Report suggests certain remedial measures for RID potable water deliveries that are unrealistic, inadequate and contrary to state law.

- In the discussion of Base Remedial Measures in Section 5.4.2 that are said to *"provide a starting point for consultation with an affected water provider"*,⁶ the WGFS Report proposes that the entire water supply in the Salt Canal may be rendered suitable for potable use by merely replacing existing well RID-114 with a new well located outside of the plume. The WGFS Report reasons that if the replacement well is assumed to have non-detectable concentrations of TCE and PCE, then the blended concentrations of these contaminants *at the end of the canal* would be 3.9 to 4.9 micrograms per liter, respectively. Contrary to state law, as more fully discussed in RID's preceding cover letter, and the remedial measures provided for other water providers, the WGFS Report fails to address RID's impacted wells, and instead unlawfully looks at the point prior to discharge or use by third parties in the West Valley.⁷
- The WGFS Report reference to a replacement well for RID-114 is inapt. ADWR allows for drilling of a replacement well within 660 feet of the existing well, and the WGFS Report indicates the well would need to be located much further distant if it were to pump uncontaminated water. The WGFS Report appears to be proposing the installation of a new well which would need to

⁴ WGFS Report, page 49.

⁵ Although not clear in the WGFS Report, the Working Group clearly stated at the recent WVBA Community Advisory Board meeting on December 1, 2014 that the Working Group would request ADEQ to shut down the existing ADEQ-approved remedial actions under the RID Modified Early Response Action as part of the Record of Decision.

⁶ WGFS Report, page 31.

⁷ See ARS § 49-282.06.B.4.b.

comply with all ADWR regulations, such as well spacing criteria. The installation of a new well presents more involved institutional challenges than implied by the WGFS Report.

- The installation of a new well that pumps uncontaminated groundwater in lieu of pumping RID-114 will reduce VOC concentrations in the Salt Canal initially, but the WGFS Report overlooks the fact that the relatively high VOC concentrations currently impacting RID-114 would migrate to other downgradient RID wells and increase mass loading at other RID wells that discharge to the Salt Canal. This measure does not provide a realistic assurance of acceptable water quality for all the reasonably foreseeable end uses of the WVBA aquifer or RID's water supply wells as required by Arizona state law and the remedial objectives established by ADEQ for the WVBA WQARF Site.
- Any operating scenario that relies on blending to meet target water quality standards at the wells needs to be sufficiently robust to assure all the reasonably foreseeable end uses over at least the next 100 years in situations where a well, or possibly two wells, with treatment systems are inoperable. Consequently there needs to be redundancy in treatment capacity.
- Contrary to statements by the Working Group, RID was not consulted regarding such a measure for managing water quality standards on the Salt Canal in direct violation of applicable state law. RID does not find the approach proposed in the WGFS Report lawful or acceptable.
- RID's approach for blending of water quality in the Salt Canal that is defined in remedial alternatives presented in its FS Report is the minimal approach that RID would consider acceptable. This action would only be conducted under an RID Well Operation and Blending Plan approved by ADEQ.

The Working Group characterization of intrinsic natural attenuation as a remedial strategy and the implication that natural attenuation of COCs will significantly restore groundwater conditions is disingenuous and a gross misrepresentation of what is occurring at the WVBA Site.

- According to EPA, *“natural attenuation processes that are at work in such a remediation approach includes a variety of physical, chemical, or biological processes that, under favorable conditions, act without human intervention to reduce the mass, toxicity, mobility, volume or concentration of contaminants in soil or groundwater. These in-situ processes include (among other factors) biodegradation, dispersion, dilution, sorption, and volatilization. When relying on natural attenuation processes for site remediation, EPA prefers those processes that degrade or destroy contaminants”*.⁸

⁸ Final OSWER Directive “Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites”, EPA Office of Solid Waste and Emergency Response, OSWER Directive 9200.4-17P, April 21, 1999.

- As indicated in the WGFS Report, “*the relative PCE, TCE, and cis-1,2-DCE concentrations generally track together over time. This pattern suggests that degradation, other than possibly in localized areas, is not a significant factor in the observed regional VOC concentration declines*”.⁹ In other words, groundwater conditions within the WVBA WQARF Site are not favorable to natural attenuation process that would degrade VOC contaminants.
- As indicated in **Attachment 6** of this letter, the dominant mechanism for any observed reductions in contaminant concentrations in groundwater is due to groundwater extraction at RID wells in the WVBA WQARF Site. This action has likely removed over 100,000 pounds of VOC mass historically and is the principal reason that VOC concentrations are declining in certain areas of the Site as acknowledged by the WGFS Report.¹⁰
- The Working Group portrays natural attenuation as a remediation strategy, but fails to note that WVBA contaminant concentrations are declining, not through any in-situ, “natural” process *without human intervention*, but rather through RID pumping of contaminated groundwater and subsequent volatilization of these hazardous chemicals into the air. This is not natural attenuation; it is a “do nothing” approach, a deceitful rationale that relies on uncontrolled release of contaminants from the groundwater into the air in violation of state and federal laws and policies.

The Working Group asserts that, “according to SRP” all RID pumping in the WVBA Site will cease by no later than 2026.

- This assertion, which is strongly disputed by RID, is even listed as a base assumption in the WGFS Report and, therefore, falsely skews the analyses and conclusions of the WGFS Report.
- The “agreements” between RID and SRP¹¹ that are referenced as the basis of this erroneous assertion have been thoroughly vetted by RID legal counsel and are currently the subject of legal action to adjudicate the dispute. The agreements obligate RID to pump *a minimum* of 85,000 acre-feet per year from the Salt River Reservoir District in perpetuity and obligate SRP to provide subsidized power to RID for this pumping “*no later than 2026.*” ADWR has “determined that the duration of these agreements [the SRVWUA-RID agreements] would not affect the legal availability of groundwater pumped by RID for use within its boundaries, for purposes of Assured Water Supply determinations.”¹² Regardless, Arizona law and WQARF rules do not require perfected water rights in order to implement a groundwater remedy

⁹ WGFS Report, A-18.

¹⁰ WGFS Report, page 20.

¹¹ SRP is not a party to any disputed contracts with RID. RID obtained deeds from the Salt River Valley Water Users Association (SRVWUA) that conveyed all of SRVWUA’s rights, without encumbrances, including the right to pump water from the land and put to beneficial use.

¹² Letter from Andrew Craddock, Manager of the Recharge, Assured & Adequate Water Supply Program to Donovan Neese, Superintendent of RID (October 21, 2013).

and provide other regulatory means to facilitate cleanup of contaminated groundwater, such as the Poor Quality Groundwater Withdrawal Permit.

- The pervasive references in the WGFS Report regarding SRP's opinion on this matter of water rights is without merit and nothing more than a distraction intended to confuse and delay the remedy selection process.

The Working Group has twisted the definition of "impaired well" to suit their own self interests.

- Consistent with state law and rule, the Remedial Objectives established by ADEQ for the WVBA WQARF Site for groundwater use include protection, restoration or replacement of any water supply "*... if the current and reasonably foreseeable future uses are impaired or lost due to the contamination from the site*". As clearly stated in the WGFS Report, Section 1.3, and consistent with ARS § 49-282.06.B.4.b, "*The overall FS technical approach was to: ... Evaluate remedial measures necessary to address any well that ... now or in the reasonably foreseeable future produce water that would be unfit for its end use without treatment due to impairment by the COCs in groundwater*".
- However, despite the clear statutory and regulatory requirements, the Working Group has intentionally misrepresented this requirement to include only those water supplies that are "currently" impaired for their "current" use. In Section 5.4.1, the Working Group states that the RID "*... wells are not impaired today, as they are currently fit for their current irrigation use without treating for COCs. Future impairment of RID wells is possible*".
- The Working Group has gone so far as to state that the "*trigger*" to address contamination in groundwater pumped by RID would be "*... the imminent delivery of water to third party water providers*".¹³ As noted in the WGFS Report, RID has clearly stated their intention to provide this groundwater to municipal users in the West Valley, and there has been significant interest by these West Valley municipalities, and others, in pursuing this source of additional water to sustain growth and provide for their future water needs. Given this clearly stated intention, there is no "*considerable uncertainty regarding the exact timing of groundwater needs within the WVBA ...*"¹⁴ as it relates to RID's near-term plans.
- In stark contradiction to the Working Group's own "trigger" approach, the WGFS Report states in section 5.1 that "*Action must begin soon enough to allow time for all the steps necessary to ensure that water use is uninterrupted or that water is available at the quality and volume for the new uses at the time it is needed*".¹⁵

¹³ WGFS Report, page 43.

¹⁴ WGFS Report, page 13.

¹⁵ WGFS Report, page 22.

- The Working Group states that “*Well-head treatment as a remedial measure for impaired, existing production wells is not recommended due to the need for costly long-term O&M of the treatment systems*”.¹⁶ However, even that statement is inconsistent since wellhead treatment is a potential measure in the WGFS Report to address any COP well that may be unfit for its use. In short, unless a Working Group member is impacted, the Working Group recommends “doing nothing,” allowing the continued uncontrolled release of thousands of pounds of hazardous chemicals into the local environment and community each year, as the recommended approach *because it’s cheaper*. Yet, the Working Group acknowledged in its own comments to RID’s FS Report that given RID’s overestimation of costs based on what the Working Group alleges is an incorrect discount value, the cost of RID’s recommended remedial alternatives that would meet all legal requirements and prevent the uncontrolled release of hazardous chemicals into the local community would be on par with the WGFS Report’s essentially “do nothing” proposals.
- What the Working Group fails to disclose, however, is that RID is legally entitled to have their impacted wells treated to restore the quality of their water supply, at a minimum, in any selected remedy for the WVBA WQARF Site.¹⁷ Likewise, the Working Group fails to disclose that all other similarly contaminated WQARF and CERCLA sites in the state require treatment as a remedial measure and prohibit uncontrolled releases of contaminants into the environment, and that ADEQ is required by law to consider remedial measures implemented at other similar sites in selecting a remedy for the WVBA WQARF Site.¹⁸

¹⁶ WGFS Report, page 37.

¹⁷ ARS § 49-282.06.B.4.b.

¹⁸ ARS § 49-282.06.C.7.

ATTACHMENT 6

ATTACHMENT 6

RID Comments on the WGFS Site Conceptual Model

Contrary to the conceptual views touted in the WGFS Report, the WVBA WQARF Site fits all the characteristics of a “complex contaminated groundwater site.”¹ Complex sites have areally extensive groundwater contamination, heterogeneous geology, large releases and/or source zones, multiple and/or recalcitrant contaminants, heterogeneous subsurface contaminant distribution, long time frames since releases occurred, and, due to inherent geologic complexities and complicated contaminant histories, restoration of the aquifer will take a long time (100 years). Therefore, in contrast to the WGFS conceptual model, a reasoned analysis of the regional groundwater contamination impacting the WVBA WQARF Site, one that appropriately considers the magnitude and extent of contamination impacts, would lead to the need for direct remedial action to address the actual challenges from such a complex site and the significant time required to remediate groundwater within the WVBA WQARF Site to comply with Arizona’s applicable numeric and narrative AWQs, the mandated remedial action criteria in ARS § 49-282.06, and ADEQ’s established remedial objectives for the WVBA WQARF Site.

The WVBA WQARF Site has all these attributes of a “complex contaminated groundwater site,” plus the complicating aspect of contaminant migration from adjacent sites having significant contamination. Clearly, one of the Working Group’s members, Univar, was aware of this complexity based on their comments on the Draft WVBA Remedial Investigation (RI) Report which noted, “[t]he concept of ‘the WVBA groundwater plume’ is a simplification of the distribution of contaminants in the groundwater in the WV[B]SA. In reality, the WVBSA has a combination of many, commingled plumes with different sources, different timing, different VOCs, and differing fate and transport processes”.²

A closer look at the factors that comprise a “complex groundwater contaminated site” highlights their significance at the WVBA WQARF Site:

Areally extensive groundwater contamination – According to the WVBA Remedial Investigation Report,³ groundwater contamination within the

¹ National Research Council, 2013. *Alternatives for Managing the Nation’s Complex Contaminated Groundwater Sites*. Washington, DC: National Academies Press.

² Univar letter to ADEQ re: *Univar USA Inc. Comments on the West Van Buren Area WQARF Site Draft Remedial Investigation Report* dated December 29, 2008.

³ Terranext, 2012.

WVBA WQARF Site encompasses approximately 12 square miles and is the areal projection of the western portion of a larger commingled plume of contaminated groundwater in the central Phoenix area. The regional groundwater contaminant plume that encompasses this area extends over 15 miles⁴ and is the largest CERCLA or WQARF site in Arizona as well as one of the largest in the country.

Heterogeneous geology and subsurface contaminant distribution – The bulk of groundwater contamination in the WVBA WQARF Site is in the UAU, which ranges from 200 to over 400 feet in thickness. Unconsolidated alluvium in the UAU is highly layered with sediments ranging from fine-grained clay and silt to very coarse gravels due to complex depositional environment in fluvial channels, flood plains, and alluvial fans. Although interbedded and continuous gravels found in the UAU are capable of transmitting large quantities of groundwater and contaminant mass, the layered stratigraphy and diverse sedimentology within the UAU adds complexity to groundwater flow and contaminant transport, particularly given the following factors.

Large releases and/or source zones – As Univar appropriately noted above, the areally extensive WVBA WQARF Site plume and associated contamination in upgradient areas is a combination of many commingled plumes from different sources, occurring at different times, and consisting of different VOCs with different fate and transport processes. ADEQ has identified over 2,000 facilities⁵ that operated within the WVBA WQARF Site alone that are thought to have used solvents and could have contributed to groundwater contamination. In addition to the large number of releases thought to impact groundwater in the WVBA WQARF Site and adjacent groundwater contaminated sites, there are also a number of large industrial facilities that used large quantities of solvents that are known to have had VOC releases.

Multiple and/or recalcitrant contaminants – Throughout the WVBA WQARF Site and adjacent sites, there were multiple releases of a number of contaminants of concern that include, but are not limited to, PCE, TCE, and 1,1,1-TCA. The physical and chemical properties of these chlorinated

⁴ To get a sense of the scale of Phoenix plume and magnitude of the problem, the NRC previously published a report that identified sites with dissolved plumes extending more than 1,000 meters (e.g. 0.62 miles) down-gradient of a source as difficult to remediate (NRC, 1994. *Alternatives for Groundwater Cleanup*. Washington, DC: National Academies Press).

⁵ The WVBA RI Report (Terranext, 2012) indicated 1,686 facilities were identified in six industrial surveys covering specific and limited portions of the WVBA WQARF Site. More recent information posted on the ADEQ web site identifies at least 670 additional facilities in an additional industrial survey published in 2014.

solvents lead to complex contaminant distribution and behavior in the subsurface and cause severe and persistent contamination.⁶

Long time frames since releases occurred – Many of the notable facilities identified as sources of groundwater contamination began operations decades ago when industrial operations expanded greatly in the post-World War II Phoenix area. For example, Reynolds began operations of their aluminum extrusion facility in the 1940s and Honeywell (dba Garrett Turbine Engine Company) began operations at the 34th Street facility in 1951. Chlorinated solvent usage also increased in the 1950s and 60s and many facilities developed on-site waste disposal systems consisting of evaporation ponds, septic systems and leach fields, cesspools, and drywells that discharged wastes directly to permeable subsurface sediments for disposal. Releases of hazardous substances that caused groundwater contamination in the WVBA WQARF Site and adjacent sites are likely to have continued until TCE and PCE solvent usage declined in the 1980s and 90s. Consequently, it is likely that the bulk of contamination in the regional plume originated from releases entering groundwater 30 to 50 plus years ago.

As a “complex contaminated groundwater site,” cleanup of groundwater in the WVBA WQARF Site will take considerable time and resources. But that is not the take-away from the WGFS Report. Instead, the WGFS Report speaks of favorable trends in declining VOC concentrations and associates the progress in terms of an overly simplistic conceptual model that down plays the need for areawide action and falsely suggests the contaminants will be mitigated by natural attenuation.

The WGFS Report indicates that two primary factors account for the observed declines: 1) mass removal through pumping; and 2) facility-specific remedial efforts and source control.⁷ The report does not elaborate on the impact of mass removal by pumping, but repeatedly notes the aggregate effect of facility-specific work in reducing source inputs and contributing to declining VOC concentrations.⁸

The WGFS Report is correct in noting VOC concentrations at certain monitor wells have declined, but is incorrect to suggest that facility-specific remedial source control efforts are responsible for the overall observed declines, or that dissolved-phase VOC mass can be flushed through the UAU1 aquifer relatively quickly once continuing sources are controlled or eliminated. The WVBA RI Report indicates

⁶ With certain exceptions (e.g. 1,1,1-TCA), chlorinated solvents do not biodegrade in the WVBA WQARF Site. Aerobic biodegradation of chlorinated VOCs does not usually occur in oxidized groundwater systems like the UAU. On the other hand, anaerobic biodegradation of chlorinated VOCs can occur under strongly reducing conditions such as in the presence of petroleum hydrocarbon releases in the subsurface. Reductive dehalogenation of PCE and TCE creates degradation by-products such as isomers of DCE and vinyl chloride. (Pankow, James F., and Cherry, John A. 1996. *Dense Chlorinated Solvents and other DNAPLs in Groundwater*, Waterloo Press).

⁷ WGFS Report, A-18.

⁸ WGFS Report, pages 7, 19, 20, and A-17.

source area remediation, primarily consisting of soil vapor extraction, has been conducted at six contaminant sources in the WVBA WQARF Site, as summarized below:

	Dates Operations Began	Dates of Source Control Actions	VOC Mass Removed (pounds)
Van Waters & Rogers (Univar)	1971	1992 - 1998	580 - 870
Maricopa County Materials Management	1964	1995 - 1997	145
American Linen Supply Company	1956	1999 - 2003	925
Dolphin Incorporated	1968	1998 - 2002	11,658
Reynolds Incorporated	1940s	1989 - 1991	Undisclosed
Prudential Overall Supply	1982	2012 - present	Undisclosed
Estimated Total			~ 13,500

As evident, the reported results indicate WVBA WQARF Site source control efforts have collectively removed at least 13,500 pounds of VOCs. Although source control actions are commendable, it should also be realized that the source areas were not likely addressed for multiple decades after the original releases and during that time, a large amount of the contaminants released migrated far beyond the source. Moreover, where DNAPL may have been present at sites like Dolphin and American Linen Supply Company, the contamination would have moved downward and/or diffused into less permeable zones where residual contamination is not as readily removed and will be a long-term, ongoing source of groundwater contamination. Unfortunately, the logical inference is that source control actions at the WVBA WQARF Site were too little and too late to significantly limit the spread of groundwater contamination and of relatively limited overall influence on declining VOC concentrations outside of the immediate source areas.

The WGFS Report also falsely concluded that remedial actions at the WOC WQARF Site and OU2 would reduce and eventually eliminate mass loading from adjacent contaminated sites.⁹ With regard to the OU2 Site, data that both RID and the Working Group have presented in the FS reports indicate that the OU2 plume containment remedy is reducing TCE mass loading in UAU1 groundwater entering the WVBA WQARF Site, which is evident in declining TCE trends at RID wells in the eastern core of the WVBA WQARF Site plume. On the other hand, there are no available data to indicate declining TCE concentrations in UAU2 groundwater. Rather, as stated in the WGFS Report, TCE concentrations *“in the UAU2 have remained relatively stable along the axis of the plume”*.¹⁰

With respect to the WOC WQARF Site, the WGFS Report falsely assumes that implementation of the WQARF remedy will address the continuing migration of

⁹ See Section 4.2 - FS Assumptions (WGFS Report, page 20).

¹⁰ WGFS Report, A-15.

VOCs into the north-central portion of the WVBA WQARF Site.¹¹ This assumption appears to be based on the statement that, “[c]omponents of the proposed remedy for the shallow groundwater system include groundwater extraction at the **downgradient** margin of the WOC site (emphasis added).”¹² In actuality, the Proposed Remedial Action Plan for the shallow groundwater system (SGWS) at the WOC WQARF Site is to install and operate three 10-gpm extraction wells along the southern margin of the WOC Facility.¹³ Given that the small capacity groundwater extraction wells are located at the upgradient source of the SGWS plume and the fact that a “relatively large geographic area has been impacted by plume migration to the south of the WOC Facility”,¹⁴ it is implausible to assume that the groundwater remedy will address the VOC mass entering the WVBA WQARF Site from the WOC Site.

A true sense of the contamination impact at the WVBA WQARF Site can be gained by reviewing the overall impact of areawide RID pumping on the plume. According to data over the past 10 years, RID wells in the WVBA have pumped an average 83,500 acre-feet (AF) of groundwater per year and removed approximately 3,000 pounds of VOC contaminants annually. Given that pervasive VOC contamination may have impacted groundwater within the WVBA WQARF Site for the past 30 to 50 years or more, and indications that the current VOC concentrations observed throughout the WVBA WQARF Site were historically higher, it is reasonable to assume that RID pumping has removed on the order of 100,000 to 150,000 pounds of VOC mass from WVBA WQARF Site groundwater.

In their attempt to minimize the nature of contamination, the WGFS Report fails to acknowledge the impact that RID pumping has on the WVBA WQARF Site contaminant plume in any meaningful way, except to indicate that if RID pumping in the WVBA WQARF Site ceases, the plume will migrate to the northwest and impact other water provider wells. The fact that pumping huge volumes of groundwater within the plume area over the past 30 to 50 years, and extraction of what may be well in excess of 100,000 pounds of VOCs has not achieved aquifer restoration, is an indication of the degree to which the WVBA WQARF Site has been significantly impacted and the challenge of fully remediating the contamination.

According to the RID FS groundwater flow model, the estimated pore-volume of the UAU plume is about 554,000 AF.¹⁵ Consequently, it takes less than seven years for the areawide RID pumping to remove one pore-volume of contaminated

¹¹ WGFS Report, page 21.

¹² WGFS Report, A-13.

¹³ *Final Proposed Remedial Action Plan, Shallow Groundwater System, West Osborn Complex Registry WQARF Site Phoenix, Arizona*, prepared by ADEQ and URS Corporation, June 2013.

¹⁴ *Final Feasibility Study Report for the Shallow Groundwater System, West Osborn Complex WQARF Site Phoenix, Arizona*, prepared by GeoTrans, Inc., January 27, 2102.

¹⁵ The pore volume of the UAU plume is based on the saturated thickness of the UAU (layers 1 and 2) throughout the estimated areal extent of UAU plume and the average of the model specific yield and porosity values.

groundwater from the WVBA WQARF Site. Over the past 50 years, RID pumping has removed a substantial amount of groundwater from storage in the WVBA WQARF Site, over seven pore-volumes, and yet we still see widespread VOC contamination throughout the plume area. Although we have no way of really knowing, there is very little data to suggest the WVBA WQARF Site plume has reduced in areal extent over these past decades.

In contrast to the WGFS Report's conceptual model, a reasoned analysis of the WVBA WQARF Site that appropriately considers the extent of contamination impacts would lead to a much more conservative assessment regarding the challenges and time required to remediate this complex site with its complicated contaminant history. The WVBA WQARF Site is not unique in this regard. Experiences throughout the country have shown that restoration of the nation's "complex contaminated groundwater sites" to a condition allowing for unlimited use and unrestricted exposure remains a significant technical and institutional challenge.

The WVBA WQARF Site and adjacent sites that contribute to the regional contaminant plume constitute a *complex contaminated groundwater site* that can only be addressed by integrating RID pumping as part of the remedy. Contrary to applicable legal requirements for a selected remedy, the WGFS Report disregards the necessity of RID's pumping to provide for the control, management and cleanup of the hazardous substances impacting the WVBA aquifer and ignores the impacts the contamination has in prohibiting and limiting the maximum beneficial use of the RID water supply wells for the economic development of the West Valley. In contrast to the limited and inadequate "remedy" recommended by the WGFS Report, the RID FS provides a regional solution to a regional problem that:

- Addresses all impacted and threatened water supply wells within the WVBA WQARF Site and vicinity;
- Proposes a plume management concept of prioritized groundwater extraction that enhances plume containment to ensure protection of unaffected wells and increases VOC mass removal from within the plume to reduce the mobility, toxicity, concentration and volume of hazardous substances in groundwater;
- Defines a RID water supply strategy and operational plan that enables blending of other impacted, but less contaminated, RID wells with treated water to achieve the required water quality for all reasonably foreseeable groundwater end uses; and,
- Identifies reliable, efficient, and low cost remedial measures to eliminate contaminant impacts at the six most highly contaminated RID wells through wellhead treatment using granular activated carbon, where such treatment permanently removes significant amounts of VOCs from contaminated groundwater, prevents transfer of VOC pollutants from groundwater to air, and limits public exposure to air toxics.

ATTACHMENT 7

ATTACHMENT 7

Response to Comments Regarding RID's Legal Authority to Provide Remediated Groundwater for Municipal Use

Comments:

The WGFS Report makes repeated references to the “legal authority” required for RID to change its current irrigation end use to deliver water to third party drinking water providers for potable use.¹ This requirement for RID to obtain legal authority and be “permitted to deliver water to potable water providers”² is implied by the Working Group to be a potential limitation to the use of RID remediated water from the WVBA Site as a source of future drinking water. The Working Group further asserts this prerequisite is encompassed by statutory requirements in ARS §45-497, §45-492(C), §45-497(B), §45-1001 and ARS Title 48, Chapter 17 or 19.³

Responses:

RID strongly disagrees with the assertions in the WGFS Report that RID must obtain legal authority to be permitted to deliver water to potable water providers. The issue is nothing more than an effort by the Working Group to confuse ADEQ and to serve as justification for the WGFS failing to meet the statutory obligations for any proposed remedial alternative to “compl[y] with A.R.S. § 49-282.06” and be “capable of achieving *all* remedial objectives”,⁴ as well as failing to specifically address RID’s impacted wells, that at the time of selection of the remedial action, will not “be fit for [their] ... reasonably foreseeable end uses without treatment due to the release of hazardous substances”⁵ from Working Group member facilities and other facilities.⁶

¹ For example, “To the extent RID ... obtains the legal authority to sell water to other drinking water providers ...” (WGFS Report, page 41 and Table 1); “... if RID obtains the legal authority to change its current irrigation end use to deliver water to third party drinking water providers for potable use ...” (WGFS Report, page 53); “Should RID obtain legal authority to sell water to third party water providers ...” (WGFS Report, page 60).

² WGFS Report, page 41.

³ *Ibid.* footnote 12.

⁴ See AAC R18-16-407.J; R18-16-407.A; R18-16-407.E.1. (emphasis added).

⁵ ARS § 49-282.06.B.4.b.

⁶ The Working Group acknowledges that it “is an unincorporated association of parties that either had or have operating facilities within the [WVBA].” Working Group FS Report, 1 (November 2014). Members of the Working Group include: Air Liquide America Specialty Gases, LP; Arizona Public Service (APS); the City of Phoenix (COP); Dolphin, Incorporated; Freescale Semiconductor, Inc.; Holsum Bakery, Inc.; Honeywell International Inc.; ITT Corporation; Laundry & Cleaners Supply, Inc.; Maricopa Land and Cattle Co.; Milum Textile Services Co.; Prudential Overall Supply, Inc.; Salt River Project Agricultural Improvement and Power District (SRP); Schuff Steel Company; and Univar USA. – formerly Van Waters

RID has the authority provided under ARS §45-494 to “continue to withdraw and transport the amount of groundwater legally being withdrawn as of January 1, 1977” for the beneficial use of its landowners within its service area, and the landowners are entitled to use the groundwater delivered. Furthermore, pursuant to ARS §48-2978, RID is granted the authority to provide the District with water, electricity, and other public conveniences and necessities, and engage in any and all activities, enterprises, and occupations within the powers and privileges of municipalities generally.

With respect to the statutory requirements that were cited as somehow precluding the delivery and use of the WVBA WQARF Site remediated water supply as a source of potable water:

- ARS §45-497 does not prohibit RID’s planned use of this water supply for M&I purposes. This specific statute provides that an industrial user may not obtain groundwater from an irrigation district in excess of the amount it was receiving in 1980, unless the user has a grandfathered right or a general industrial use permit.
- RID anticipates that groundwater withdrawn as part of the Modified Early Response Action approved by ADEQ or any approved remedial action plan developed for the WVBA WQARF Site will be delivered to the lands of the District for all beneficial uses, including irrigation, municipal, and industrial purposes. District water service for M&I users will be in accordance with the accepted ADWR authorities. RID will not distribute groundwater to any industrial user beyond the confines of the provisions of ARS § 45-497(B). Water service to municipal water providers may indirectly supply water to industrial users, but the provider, not the District, would be serving those industrial use customers.
- ARS §45-492(C) governs service area withdrawals by cities, towns and private water companies. It does not apply to irrigation districts. It allows for ADWR approval if a city, town or private water company wants to contract to supply water to another city, town or private water company. That is because it involves moving water out of one service area in to another, which is not otherwise permitted. In RID’s case, RID has the statutory right to “withdraw and transport” the water pursuant to RID’s service area right, as referenced above, but it can only be used in RID’s service area. ADWR approval is not required.

& Rogers. Penn Racket Sports (HTM Sport GmbH/HEAD USA/HEAD Penn Racquet Sports) participated in the early stages of the Working Group. In fact, 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).

- ARS §45-1001 relates to water exchanges, and therefore, is inapplicable.
- ARS Title 48, Chapter 17 contains the statutes that govern SRP and these requirements are not applicable to RID.
- ARS Title 48, Chapter 19 contains the statutes governing irrigation districts. This provision contains certain restrictions regarding whom a district can serve. RID will structure any agreements for future M&I supply to comply with those restrictions.