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8 **IN THE OFFICE OF ADMINISTRATIVE HEARINGS**

9 **FOR THE STATE OF ARIZONA**

10 In the Matter of:

11 ADEQ

12 Air Quality Permit No. 55223

13 Rosemont Copper Project

14 Place ID: 135845

Docket No. 13A-A006-DEQ

Docket No. 13A-A007-DEQ

Docket No. 13A-A008-DEQ

Docket No. 13A-A009-DEQ

Docket No. 13A-A010-DEQ

**APPELLANT JOEL FISHER'S PRE-  
HEARING BRIEF**

15 **INTRODUCTION AND SUMMARY**

16 Appellant Fisher, through counsel, hereby files his Pre-Hearing Brief. Appellant Fisher  
17 will present a number of issues and testimony related to four major areas: (1) ADEQ's issuance  
18 of the permit was unreasonable or arbitrary because it does not protect human health as  
19 required by the Clean Air Act; (2) ADEQ arbitrarily or unreasonably issued the wrong kind of  
20 air quality permit; (3) ADEQ unreasonably, arbitrarily and/or capriciously issued the permit  
21 based on faulty modeling and calculations, data problems, and related matters and issuance of  
22 the permit is arbitrary because the scientific basis and support for the permit simply does not  
23 support issuance of the permit; and (4) information provided during this appeal, including  
24 evidence improperly withheld by ADEQ provides proof suggesting political involvement or  
25 pressure may have played a role in the above unreasonable or arbitrary decisions, and the  
26 evidence provided by ADEQ further shows that considerations having nothing to do with  
public health arguably impacted the agency in relation to its work and issuance of the permit.

1 This Pre-Hearing Brief is an overview of the issues raised in Appellant's Appeal and  
2 comments to the Permit process, and omission of any such issues in the following Brief is not  
3 intended to indicate abandonment of the issue. Much of the following is highly technical.

4 Among the issues discussed in detail below, Appellant here highlights some of the  
5 unreasonable and arbitrary failures resulting in issuance of the permit as follows. First, there is  
6 a significant and fundamental data gap in the materials provided to and relied on by ADEQ  
7 (also referred to as the "Agency"), in the context of chemistry, mineralogy, and radioactivity  
8 data. This failure undermines the permit process and decision on a number of fronts. Another  
9 unassailable and undeniable failure is the unreasonable and arbitrary – but false-- assumption  
10 that evaluation of particulates using the PM10 standard takes care of all HAPs. Indeed, the  
11 bulk of particulate HAPs will be addressed in the new EPA PM 2.5 standard.

12 ADEQ failed to evaluate or consider HAPS from aerosols, improperly relying on the  
13 absence of consideration of such in the AERMOD modeling program; absence of this in  
14 AERMOD does not mean that ADEQ has no duty to protect public health regarding aerosols.  
15 There is also the requisite regulatory duty to consider and evaluate at the PM30 level to the  
16 extent materials dispersed include HAPs that cause natural or public health dangers elsewhere.  
17

18 Examples of HAPs that ADEQ unreasonably and arbitrarily declined to evaluate or  
19 even consider, include HAPs which are chemically formed as the result of processes at the  
20 proposed mine. For example, carbonyl sulfide and carbon disulfide are HAPs and listed in  
21 Section 112(b) of the Clean Air Act. However, they are chemically formed and highly  
22 reactive. They are produced in the blast processes contemplated, and depend on hydrogen  
23 sulfide. ADEQ and Rosemont did not report any data concerning hydrogen sulfide (which  
24 itself is not a regulated pollutant), which means they neglected to consider the formation of two  
25 HAPS in the blast process relying on hydrogen sulfide, which are definitively created through  
26

1 their explosive combustion process. Likewise, carbon monoxide can react with other  
2 constituents of the ores in the blast process, similarly creating HAPS, but was also not  
3 considered. But we know also know that the only HAPS gases that Rosemont or ADEQ  
4 evaluated at all as indicated in their records were gases related to vehicular emissions.

5 Similarly, ADEQ unreasonably and arbitrarily neglected to consider the gas Radon,  
6 which is a radioactive gas that is a HAPS, claiming that because there is no federal emission  
7 standard for radio-nuclides, that they do not have to evaluate for it. This is false. Federal law  
8 states that when there is radioactive HAPS material present, but no emission standard, the  
9 regulator must then go to the weight based standard as a default, and perform other evaluative  
10 analysis for potential to emit calculations. This they have not done.

12 Likewise, because Uranium is present at the mine site, this means that the radioactive  
13 HAPS Thorium (a secondary decay daughter-isotope of Uranium) is also present – and even  
14 possibly present at this site in large quantities -- and a weight-based standard and analysis  
15 method is possible. Yet, absolutely no evaluation of Thorium was done, even though drill  
16 holes or boring or explosions could release this HAPs into the atmosphere, going off as  
17 radioactive Thorium particulates. ADEQ has unreasonably neglected to measure if PM10  
18 contains any radioactivity. ADEQ cannot simply turn a blind eye to chemistry, mineralogy and  
19 radioactivity.

21 Furthermore, Rosemont has indicated that Asbestos is present, but they have never  
22 quantified how much of it is present or where. Asbestos comes in various forms, including  
23 Serpentine and Tremolite, both of which are present at the site. ADEQ never addressed or  
24 rebutted this in their comments. A trace quantity can be deadly. It does not matter whether the  
25 material is in fibrous or non-fibrous form. Asbestos is also unique in that a number based  
26 standard is used for evaluation, based on nano-particles and a microscopic mineralogical

1 examination of the particulate matter – something which is unreasonably and arbitrarily absent  
2 from the Permit. **This was never done. ADEQ admits to only evaluating on a gravimetric**  
3 **level, and that no minerological or chemical composition evaluation is done, which is**  
4 **scientifically flawed and unreasonable in the context of public health.** Any effort to  
5 describe the presence of such Asbestos as “de minimis” has no legal or factual weight, given  
6 the deadly nature and failure of the Agency to consider it.

7  
8 With regard to modeling and data collection, ADEQ unreasonably and arbitrarily  
9 accepted compromised data sets provided by Rosemont. Indeed, the data did not even conform  
10 to Rosemont's own Quality Assurance Plan, and it is unclear who made the corporate decision  
11 to deviate from the Quality Assurance Plan in a manner to allow substitution of data by an  
12 empirical method that is the least justifiable scientifically of the available empirical data  
13 substitution techniques. The method actually used is unjustifiable because statistical data is  
14 likely not computed accurately due to the high level of substitution (10%), the substitution data  
15 methods rely on random substitution whereas this method was calculated and non-random, and  
16 the normal warning trigger concerning reliability arises when 50 substitute values are used  
17 whereas Rosemont actually substituted 2,100 –so far above the norm as to render the entire  
18 data set unusable and compromised. Consequences from reliance on such fundamentally  
19 flawed and suspect data include result failure in the scientific conclusions, both positive and  
20 negative (including false positives, and false negatives).

21  
22 Finally, as described earlier, the evidence provided and the evidence withheld by  
23 ADEQ suggests that political involvement or pressure may have played a role in the above  
24 unreasonable or arbitrary decisions, and the evidence provided by ADEQ further shows that  
25 considerations having nothing to do with public health arguably impacted the agency in  
26 relation to its work and issuance of the permit.

1 In sum, based on the evidence to be presented, Appellant Fisher is confident that this  
2 Court will conclude that the Agency's issuance of the permit was unreasonable, arbitrary,  
3 and/or capricious, and was also based on invalid technical conclusions, as well as matters not  
4 otherwise permitted by Arizona or Federal law.

5 **I. ADEQ's ISSUANCE OF THE PERMIT UNREASONABLY & ARBITRARILY**  
6 **FAILS TO PROTECT THE PUBLIC HEATH AND SAFTEY OF ARIZONA**

7 **Hazardous Air Pollutants (HAPs)**

8 The federal Clean Air Act defines two kinds of pollutants: primary or *ambient*  
9 pollutants under the NAAQS system (National Ambient Air Quality Standards) and special  
10 pollutants which are designated as hazardous and toxic (HAPs). HAPs are specific chemicals,  
11 often of industrial origin or agricultural and industrial usage. Many HAPs do not have a “safe”  
12 or threshold level, such that even one molecule exposure to the substance carries some risk of  
13 an adverse health effect. HAPs in this category are often carcinogens or some other kind of  
14 developmental or genetic toxin. Also, HAPs tend to react chemically with each other and with  
15 other chemicals which they come in contact, thus necessitating regulatory actions for  
16 combinations and mixtures of these hazardous and toxic pollutants.  
17

18 Rosemont's submission and ADEQ's permit emphasized the primary NAAQS air  
19 pollutants, but unreasonably fails to address the HAPs adequately. This is because of 1) an  
20 inadequate and flawed method of estimating the level of HAPs which led to a questionable and  
21 unreasonable conclusion that the levels of HAPs are too small to be considered, and 2) ADEQ  
22 unreasonably fails to consider extant HAPs by unreasonably positing that that they either lack  
23 guidance from EPA on certain matters or that they do not have a specific policy to address an  
24 issue, neither of which is a reasonable agency action when faced with the presence or potential  
25 to emit known toxic HAPs listed in Section 112(b) of the Clean Air Act.  
26

1 The Clean Air Act discusses the “potential” to emit HAPs. This regulatory concept  
2 considers and expressly addresses the possibilities that HAPs will be emitted above levels that  
3 regulators currently believe to be associated with low risk exposure. The Act therefore calls  
4 for a reasonable evaluation and analysis whether these substances have the potential to be  
5 emitted in excess of the indicated thresholds. To try to evaluate a potential to emit HAPs, the  
6 analysis requires a complete examination of how and where HAPs are generated and their  
7 subsequent fate and transport.  
8

### 9 **Generation Of Hazardous Air Pollutants (HAPs)**

10 HAPs originate at several stages in the Rosemont Copper project. These include the  
11 initial blasting to release ore material for further processing; intermediate (electrowinning)  
12 processing stages which handle the ore in various places; and a final dry stack disposal process.  
13

#### 14 **The Blasting Stage**

15 The blasting stage to release ore for processing is the first major HAPs generation step.  
16 Neither Rosemont's submissions nor ADEQ's documents show how HAPs were calculated and  
17 presented, only final numbers. Rosemont's submission is also out of date with respect to EPA  
18 regulations regarding permissible levels of particulate matter, which were lowered to a stricter  
19 standard in December 2012.

20 The blasting process is a mechanism for production of HAPs depending on the chemical  
21 composition of the material subject to the blast. Nothing in Rosemont's submission nor ADEQ's  
22 permit addressed production of HAPs through chemical reactions between NAAQS products of  
23 the explosive and constituents of the ore source material.  
24

25 Blasting releases two HAPs to the atmosphere: radon (a radioactive element) and  
26 tremolite (an asbestos mineral). Radon raises the issue of all transuranics: uranium, thorium and  
radium, and radioactivity of HAPs. Tests of the waste rock shows that radioactive elements are  
present in the source ore material. Radon is a *gas*, therefore all HAPs from this source are not

1 particulates. Disturbing the landscape releases trapped radon immediately to the atmosphere. The  
2 current air quality permit requires *no* radioactivity measurements. Thus, the radioactive  
3 emissions after blasting are unknown, unmeasured and unaccounted for.

#### 4 **Secondary HAPs formation through chemical reactions following the blast**

5  
6 Detonation processes create an environment of high temperature and pressure, especially  
7 in the confines of a bore hole environment. Carbon monoxide and methane produced by the  
8 explosive are powerful reducing agents under conditions of high temperature and pressure. The  
9 heat from the blast creates almost a mini blast furnace/coke oven environment and carbon  
10 monoxide can reduce minerals which contain arsenic, phosphorus, selenium, fluorine, nickel and  
11 uranium to release these substances as elements. Sulfuric acid can adsorb arsenic, lead and  
12 selenium compounds to produce an *aerosol* (also not a particulate) with the extracted elements as  
13 ions or as compounds in a combined particulate/aerosol phase. Rosemont's calculations contain  
14 no mention or examples of chemical reactions and/or aerosol formation.

#### 15 16 **Secondary Production of Gaseous HAPs Has the Potential to Emit Significant Amounts of HAPs**

17 The large number of blasts combined with the high production of the Rosemont Mine  
18 create the potential to emit significant amounts of gaseous HAPs. The Mine Plan of Operations  
19 calls for 80 bore holes, one blast per bore hole per day, or 29,200 blasts/yr, and processing of  
20 75,000 lb/hr of ore. When the numbers are combined with HAPs claimed by Rosemont from the  
21 blasting stage (about 3tpy), the emissions *could exceed* the combined HAPs thresholds. Thus, the  
22 release of unmonitored and unmeasured gaseous HAPs following the initial blast stages can  
23 occur in amounts which can come close to or even exceed the thresholds given in Section 112 of  
24 the Clean Air Act.  
25  
26

1 **Conclusions Based on a Review of the Blast Stage Information**

2 The possible HAPs that could be formed in the blast stage come in multiple forms.  
3 Therefore, to look at the potential to emit HAPs under Section 112(b), both Rosemont and  
4 ADEQ must account for *all* forms of HAPs that can be emitted. That means a total material  
5 balance for each known or possible HAP related to the ore source material. This situation shows  
6 a critical need for *supplemental* modeling beyond what has been submitted in the permit  
7 application. ADEQ's view is that the HAPs are too small to be considered. Still, "too small..." is  
8 much larger than thought and could have the potential to emit at levels that approach or even  
9 exceed HAPs thresholds.  
10

11 **The Electrowinning Process**

12 The air quality permit looks at this process even though Rosemont stated in 2012 that it  
13 was dropping it from its Mine Plan of Operations. ADEQ stated that it must deal with the permit  
14 request before it. If removing this step changes the air emissions, then the permit can be revisited  
15 or amended. Rosemont's position is duplicitous: if market conditions warrant, the step will be  
16 restored, allowing it process oxide based copper ore.  
17

18 **The Dry Stack Disposal System.**

19 This final step of the Mine Process of Operations is likely to generate the most HAPs.  
20 ADEQ has accepted Rosemont's submitted comments that walls constructed around the stacks as  
21 wind breakers, hosing operations to control dusting, and revegetation of the area will provide all  
22 the controls needed to prevent the dry stack from becoming a source of air pollutants. Rosemont  
23 will provide a plan of operations for the dry stack which ADEQ will release for public comment,  
24 but this plan will be vetted *after* the permit process is complete and *after* Rosemont has begun  
25 work on the site.  
26

The information submitted on the dry stack disposal system raises issues: Rosemont's proposed system will be the largest dry stack disposal system in the world. The next smaller



1 system sits on a mountain top in South America and has less than 10% of the size of the  
2 proposed Rosemont stack. This smaller system exists in a different ecozone from the proposed  
3 Rosemont system.

4 The modeling of emission dispersion and transport from the Rosemont site relies on data  
5 at ground level. If Rosemont continues to model dry stack data this way, it seriously ignores that  
6 the emissions will likely occur at altitudes of 200 to 500 feet above the ground. The vertical  
7 profiles of climatological parameters at nearby sites on federal lands show significant differences  
8 between measurements at ground level and those at altitudes 200 to 500 feet above ground, as  
9 much as 20 fold difference in some cases, but Rosemont's consultants have not measured  
10 climatological parameters for the higher altitudes.

11 The permit for the dry stack disposal system contains a provision to suspend particulate  
12 hosing operations for dust control of particulate emissions when wind velocities exceed 25mph.  
13 ADEQ has not considered the possible potential to emit HAPs during this period in which  
14 particulate control through hosing operations is suspended. The conditions of hosing can also  
15 generate secondary aerosols, and that is also not considered by ADEQ in the permit.  
16

17 There are concerns about the accuracy and performance of Rosemont's equipment to  
18 obtain background meteorological data because of where and how it was positioned at the site,  
19 and the design of the background meteorological measurement plan because of altitude and  
20 terrain variability. Such factors require more than a *single* station to measure climate parameters:  
21 a single site cannot provide representative data to be used in the analysis of the dry stack disposal  
22 processes, nor provide coverage for the extent of the area of the mine processing.

### 23 **Other Mechanisms for Release of HAPs from the Dry Stack**

24 The hosing operations for dust control can result in the formation of secondary aerosols.  
25 Given the solar radiation at the site, it is also possible to have photochemical oxidation of waste  
26 slurry and dry stack constituents to release pollutants from the dry stack that are transformed into  
aerosols. These reactions are likely to occur with sulfide and sulfate in the dry stack to form

1 sulfuric acid mist, and with elements of multiple valence states that have photochemical activity,  
2 notably manganese, chromium, arsenic, and selenium.

### 3 **Conclusion**

4       The important bottom line on HAPs is that while various mechanisms and calculations  
5 individually may produce very low emitted quantities of HAPs, the totals can still exceed the  
6 thresholds of Section 112 of the Clean Air Act. The Clean Air Act does not require one to prove  
7 that the emissions will actually exceed the threshold, only that under a set of reasonable  
8 conditions, this is very likely. *In this case, the potential to emit has been established.*

### 10 **II. GIVEN THE HAPs PROBLEM, ADEQ HAS ISSUED THE WRONG PERMIT**

11       ADEQ should have issued a Class I permit, not a Class II permit. The Class I permit is  
12 appropriate because HAPs create probably the only situation which forces a Class I permit  
13 when the parties requesting the permit argue they are not major sources or consider themselves  
14 “synthetic” minor sources, or claim they are not categorical sources or not subject to  
15 technology limitations under the Clean Air Act. ADEQ's unreasonable claim that many  
16 holders of Class II permits “voluntarily agree” to more rigid control requirements to avoid a  
17 Class I permit does not assure the necessary regulatory controls. Voluntary controls are just  
18 that: voluntary. There is no penalty if they are violated, withdrawn, amended or otherwise  
19 manipulated in a manner adverse to protection of human health and environmental values.

### 23 **III. MODELING FAILURES: THE UNREASONABLE AND ARBITRARY 24 ISSUANCE OF A PERMIT BASED ON FLAWED TECHNICAL DATA**

25       The evidence to be presented establishes modeling failures demonstrating the  
26 unreasonable and arbitrary issuance of a permit by ADEQ based on flawed technical data.

Although the following is highly technical, the simple conclusion is that there are many  
demonstrable and fatal technical deficiencies with the Rosemont studies, and a demonstrable

1 lack of technical expertise, as well as irresponsible and negligent regulatory oversight, from  
2 ADEQ in its unreasonable actions to accept these studies, including condoning of  
3 unprofessional work lacking in valid support. The bottom line is that the data collection, and  
4 models and calculations cannot support the air quality permit because they were flawed and  
5 compromised from the start. Under the circumstances, issuance the permit was unreasonable,  
6 arbitrary or capricious, and alternatively resulted in invalid technical conclusions as well.

7  
8 ADEQ requires that a permit applicant for an air quality permit provide dispersion  
9 modeling using AERMOD to determine the impact of the pollution from this applicant on  
10 NAAQS levels at various target locations. AERMOD, a computer program which EPA has  
11 intensively reviewed and updated for use by agencies of States, counties, cities, and other  
12 government entities, is a steady state dispersion model which requires considerable background  
13 data to calibrate for local conditions, and then estimates the levels of selected air quality  
14 parameters at various target locations. If multiple sources contribute to the levels of selected air  
15 quality parameters modeled, the model treats these multiple pollutant plumes from these  
16 sources as additive. It has no capability to handle any chemical interactions among or within  
17 the pollutant plumes, nor does it can it handle aerosols well or accommodate secondary aerosol  
18 production.

19  
20 Rosemont's consultants have collected background data for use in AERMOD which are  
21 mainly climatological and meteorological, and address one NAAQS parameter, that of  
22 particulate matter. Rosemont has relied on data from other sources for other NAAQS  
23 parameters, notably NOX, carbon monoxide, ozone and sulfur dioxide. The problems  
24 addressed here relate mainly to these data collections and associated activities.

25  
26 **The Experimental Design of the Meteorological Data Collection Was Inadequate and Flawed**

Rosemont's modeling deficiencies start at the outset with the initial choice of a single

1 meteorological monitoring station. The variable terrain and nature of the Rosemont site would  
2 logically call for more than one station, perhaps even a small network of meteorological  
3 monitoring stations. ADEQ supported Rosemont's view that only one station was necessary  
4 because it sat at the “ground zero” of the site for any emissions.

5         Regardless of ADEQ's view, the criticisms of this single site by Appellant and others  
6 remain appropriate and valid. Specifically, ADEQ unreasonably ignored valid criticisms  
7 demonstrating problems the data collection, including:

8             (a) the equipment was sheltered to a large degree from the winds and conditions it was  
9 to measure. That is an unreasonable failure. ADEQ unreasonably discounted photographic  
10 evidence of this submitted by one of the critics.

11             (b) Known plans for the site indicated that many of the potential emissions would occur  
12 at altitudes considerably above the ground. However, no stations were established to measure  
13 meteorological conditions at altitudes that track these other potential emissions at these  
14 altitudes. ADEQ did not reply or comment on this.

15             (c) Rosemont's consultants did not measure vertical profiles of wind patterns at the site  
16 of this station. This prevents any correlation with data and information from nearby air quality  
17 monitoring sites on federal lands. This fundamental deficiency in quality control would have  
18 shown Rosemont's consultants where their data were not consistent with known climatological  
19 conditions of the area, as well as point out unique differences between Rosemont's site and  
20 nearby sites on federal lands, and thus enable more effective modeling. ADEQ did not  
21 comment on this.

22             (d) Known seasonal patterns of winds in the area coupled with the topography of the  
23 site suggested the need to have monitoring stations at certain boundaries of the site to confirm  
24 the dispersion and transport impacts of various wind patterns, including unusual but observed  
25  
26

1 seasonal wind patterns. ADEQ did not comment on this.

2 (e) The areal size of the site (7,000+ acres) is much too large to assume that a single  
3 meteorological monitoring station could capture its background climatology effectively  
4 because of the heterogeneity of the landscape. ADEQ unreasonably dismissed this argument by  
5 noting that the since the station was at the source of the pollution to be emitted, it was the  
6 proper station for all calculations. Such a sweeping assessment by ADEQ is itself questionable.

7  
8 Furthermore, the data collection from this single station had its own deficiencies and  
9 problems. The first deficiency is that it did not collect background data for the site on all  
10 NAAQS pollutants, only particulate matter. Thus, the data from this site cannot provide for  
11 “ground truth” information to validate dispersion and transport equations that would estimate  
12 the impacts of existing sources on this site, as well as background data against which one  
13 would measure increases in the emissions of NAAQS pollutants once activity at the site begins.

14 The absence of fundamental “ground truth” measurements renders all other estimates  
15 and conclusions speculative about the Rosemont site's release of NAAQS pollutants and their  
16 effects on target areas from dispersion and transport modeling. Further, it is difficult to  
17 confirm Rosemont's consultants estimates under these conditions. This is unreasonable, and as  
18 such, it was arbitrary and unreasonable for ADEQ to rely on Rosemont data and conclusions.

19  
20  
21 **The Failure To Measure Background Data For Lead Is Unreasonable And Constitutes A**  
22 **Potential Violation Of The Clean Air Act**

23 As of 2012, monitoring of airborne concentrations of lead are now required in Arizona.  
24 ADEQ has argued that its analysis of lead levels in air are so low as to be a non-issue here, but  
25 ADEQ has not provided the fundamental data for that determination nor its calculation of that  
26 determination. Rather, ADEQ used a calculation method based on the appellants submission  
which ADEQ claimed was “erroneous.” ADEQ further compounded the errors of this situation

1 by assuming that all background lead came from the ore source material, and was found in a  
2 very small PM10 fraction. ADEQ further used a median lead concentration estimated by the  
3 appellant which they had previously declared erroneous because its source was the Baseline  
4 Geochemistry Report. How many mistakes must ADEQ make and assume they all cancel out  
5 to produce a valid number for their arguments? Regardless, they must still monitor for lead.

6 **Fundamental Modeling Parameters Were Not Measured.**

7  
8 Rosemont's consultants did not measure all necessary modeling parameters, but rather  
9 depended unwisely on the estimating capacity of internal subprograms to AERMOD. This was  
10 particularly in the case of relative humidity and precipitation. These parameters are needed in  
11 calibrating AERMOD models and useful for determination of depositional potential of  
12 pollutants. ADEQ's response here was that internal programs within AERMOD accommodated  
13 the relative humidity problem, and that there were no uses of precipitation data in any of the  
14 modeling undertaken. However, ADEQ unreasonably ignores the fact that there are limits on  
15 the estimating power of subprograms in AERMOD with respect to omitted or assumed  
16 climatological variables. Furthermore, as to not using a particular measurement, that does not  
17 mean such measurement is not needed, useful, or correct. Nor does it mean that ADEQ and  
18 Rosemont's estimates of air quality parameters without these measurements is automatically  
19 and necessarily accurate, correct or appropriate. Indeed, the data problems show otherwise.

20  
21 **The Modeling Did Not Utilize Appropriate Data from Appropriate Meteorological Sites –**  
22 **Especially with Respect to Solar Intensity and Cloud Cover**

23 For other calibrating parameters for AERMOD, notably solar intensity and cloud cover,  
24 Rosemont's consultants did not use the appropriate data from nearby Class I federal weather  
25 monitoring sites. Instead they used data from records of Pima County and other groups which  
26 showed “interrupted time series” properties, or other structural deficiencies, notably problems  
associated with cloud cover data from Tucson International Airport. Rosemont's failure to use

1 the Class I meteorological sites on nearby federal lands has created an avoidable situation of  
2 data deficiency. Once again, ADEQ dismissed valid technical criticisms with arguments about  
3 how this routinely done elsewhere, etc. The “everybody does it” claim does not pass muster.  
4 Clearly ADEQ unreasonably condones unprofessional and statistically incorrect performances.  
5

### 6 **Rosemont's Data Collection Had a Faulty Quality Assurance Plan That Failed**

7 Rosemont's consultants spent considerable effort -- according to their documents -- to  
8 establish a quality control plan for the air quality measurements that would meet EPA  
9 requirements. Astonishingly, they then managed to deviate from this plan on several  
10 occasions, raising the obvious question: of what use was this quality assurance plan in the first  
11 place? The following issues - and ADEQ unreasonably turning a blind eye -- is arbitrary.  
12

13 One significant regulatory concern related to deviations from the quality assurance plan  
14 is that EPA has specific guidelines on who may authorize deviations and changes from an  
15 approved quality assurance plan, and restrictions if those authorizing authorities are in the same  
16 corporate units as the groups who collect and analyze the data and operate the various  
17 instrument systems. Throughout the background documents on air quality, those persons  
18 approving changes and other deviations for Rosemont were unknown corporate entities and  
19 their basis for such approvals were mostly devoid of any scientific evidence. The entire data  
20 collection and quality assurance project for the Rosemont site – on its face -- appears totally  
21 inadequate in its coverage, and ostensibly inconsistent with EPA guidelines without justifying  
22 remarks and explanations.  
23

24 Moreover, Rosemont's consultants determined that a three-year period of continuous  
25 background data on the climatology of the site was needed for the calibration of the AERMOD  
26 and other computer models that might be used in Rosemont's submissions. The three year  
period seems an appropriate choice, *but the data that were actually collected were not*

1 *continuous, nor was the three year period covered correctly.* Because of equipment failures,  
2 three months of initial data were lost, and the quality assurance plan kicked in three months  
3 after the measurements began. Such significant problems are unreasonably ignored by ADEQ.

4 A simple approach might have extended the data collection for another year, beginning  
5 at the date on which the quality assurance plan kicked in, and indicating that the period prior to  
6 this was a testing and trial run which revealed equipment failures. They would have a fresh  
7 data record with an approved and vetted quality assurance plan that begins with actual period  
8 of measurements, including a shaking down system and extending sufficiently into the future to  
9 cover completely the length of time lost because of early problems. This was not done.  
10

11 Instead, they rely on the flawed initial data. Thus, even though Rosemont's consultants  
12 have continued to measure meteorological parameters at the site, although not necessarily  
13 continuously, the salient fact remains: *Rosemont and ADEQ continue to maintain their*  
14 *dependency and use of the flawed initial three year period of data for their modeling.*  
15

16 It gets worse. Rosemont's consultants then undertook a data substitution and  
17 imputation procedure. They repeated three months of data from the next year for the same  
18 season that they had lost previously. They argued that seasonality consistency in the data  
19 would justify this substitution because the same season in two years was being used. But they  
20 used the same run of data twice without considering its possible adverse consequences.

21 Problems associated with data imputation procedures are discussed later, but Appellant  
22 notes here that Rosemont has indicated that this was corporately approved, but by whom and  
23 why remains unknown. ADEQ merely accepted this data at face value, and in so doing  
24 accepted a faulty background data record as the basis for all modeling. Because those data are  
25 compromised, they should not have been used and ADEQ should withdraw the permit for that  
26 reason alone -- because those data cannot scientifically support the permit action.



1 **Rosemont's Consultants Have Incorrectly Handled the Fundamental Climatological**  
2 **Parameters of Albedo and Cloud Cover**

3 Many critics -- including Appellant -- have commented on the experimental design used  
4 to collect data for modeling purposes and articulated their deficiencies and errors. ADEQ has  
5 simply dismissed their expert remarks with a proverbial wave of the hand, with comments to  
6 the effect that "that is how things are done," or "they have no guidance or policy directives."

7 For example, ADEQ dismissed criticisms of albedo and cloud cover data utilization in  
8 the AERMOD modeling. In the former case, ADEQ actually dismissed photographic evidence  
9 of vegetative cover which challenged the albedo numbers chosen by Rosemont's modelers.

10 ADEQ comments in the Responsiveness Summary reasoned that the evidence merely captured  
11 a single day's situation, whereas the default choice captured a seasonal situation. During  
12 Appellant's tenure at the United States Department of State, Appellant directly participated in  
13 research modeling of the United States and other countries with respect to global circulation of  
14 pollutants and their climate effects. That work showed that albedo was so sensitive a modeling  
15 parameter that it could affect model calculations and results in a major way even to the fourth  
16 decimal place of this parameter. Rosemont's consultants only used albedo estimates to two  
17 decimal places, and their choice was a default position. Furthermore, Appellant has learned  
18 from this experience that albedo is probably the most difficult concept to interpret and use in  
19 climate models with respect to parameter measurement and estimation. In this regard,  
20 Rosemont's consultants should have obtained extensive "ground truth" information on  
21 vegetative cover before choosing albedo numbers using a default criterion in the first instance.  
22  
23

24 ADEQ's comments unfortunately are so completely mistaken on the subject of albedo  
25 that they betray a total lack of expertise in reviewing climate modeling. Simply put, ADEQ  
26 should not have accepted Rosemont's data in this case. The consequence is that all results which  
depended on these incorrect choices of albedo cannot support any aspect of Rosemont's permit

1 or submission. In short, the entire modeling here is compromised and flawed. Consequently,  
2 the issuance of the permit was unreasonable, arbitrary, capricious and technically flawed.

3 While Appellant has worked extensively with albedo, Appellant's position on cloud  
4 cover are restricted to addressing statistical aspects of the data used. Rosemont's submissions  
5 showed that the cloud cover data came from interrupted time series data sets. Although one can  
6 argue about the reasons for characterizing these data sets as interrupted time series, the  
7 situation calls for a special statistical analysis that first determines whether the pre-interruption  
8 series and the post-interruption series are homogeneous. If they are not, then certain other tests  
9 are needed before one can use the data sets as a continuous data stream. These tests were not  
10 performed with respect to cloud cover, and from the material presented by Rosemont and its  
11 consultants, the two series are not statistically homogeneous. When this was pointed out to the  
12 Agency, ADEQ dismissed the criticism with a remark that to the effect that "everyone does  
13 this," or this is a standard practice, or that this is done because it is the only thing available.  
14 The tests available are routine and not research materials. ADEQ's reasoning does not make the  
15 calculations correct, it only shows that ADEQ unreasonably and arbitrarily continues to  
16 condone unprofessional and incomplete work and data provided to it by Rosemont.  
17  
18

### 19 20 **Data Imputation Procedures**

21 Data substitution and imputation procedures are more art than science. The theory here  
22 is very sparse, but there are indeed standards. When a data record has only a few entries  
23 requiring either substitution or imputation, and these entries occur randomly distributed  
24 throughout the record, or there are a few instances where mistakes in methodology of sampling  
25 and measurement were documented that are correctable, then there are some empirical ways of  
26 handling the situation involving data substitution and imputation. However, the use of these

1 techniques requires an intensive and comprehensive understanding of the system being studied.  
2 Significantly, the convenience of a technique does not justify its scientific use.

3         The problems arise when a data record has many instances of data substitution, and/or  
4 whole sequences of consecutive data or data runs require imputation, or data available in the  
5 record suggest very large and rapidly occurring data fluctuations, and/or external events  
6 suddenly change the nature of the system being measured. In these cases the substitution and/or  
7 imputation method requires considerable justification and analysis to show that it can maintain  
8 the integrity of the data set. Appellant has performed such studies in the course of his career,  
9 and they dealt with far longer time series data records than Rosemont's consultants, and  
10 involved far more advanced statistical analyses than what appears in the Rosemont consultant  
11 reports. Further, Appellant has never used – and would not use -- the technique which  
12 Rosemont has used here because it is the least justifiable empirical approach.  
13

14         Two significant scientific data concerns immediately leap to mind with respect to the  
15 problematic data imputation performed by Rosemont's consultants:  
16

17         (a) there was a data run where more than 50 consecutive data substitutions were made.  
18 In fact, Rosemont's consultants imputed a data run of more than 2100 consecutive data entries  
19 (24 hourly averages for the each of the days in three months).

20         (b) The imputation came numerically close to 10% of the total data record. In a three  
21 year record, or 36 months, 10% of the record is between 3 and 4 months.  
22

23         Furthermore, the background meteorological data report did not show any significant  
24 time series analyses like AR, MA, ARMA, ARIMA studies, stationarity analyses, Monte Carlo  
25 simulations or similar activities. Arguably, such analyses might have collapsed the data record  
26 and possibly enabled one to deal with a much smaller data imputation need, but there are no  
guarantees here.

1           Some statisticians use the number 50 as a length of run for consecutive missing or  
2 imputed data as an indicator that the record being adjusted is not continuous. The fear is that  
3 the adjustments would likely not enable one to show deviations from any trends present in the  
4 already existing data or show some kind of serious change in a system property. Such  
5 circumstances call for methods to address “interrupted series,” which Rosemont did not use.

6           It isn't clear in this specific set of circumstances that methods for “interrupted series”  
7 would apply because the pre-interruption data set was at the very beginning of data collection,  
8 and the length of the data run might not permit certain parts of the needed statistical tests.

9           The 10% guideline for missing data is a sort of “rule of thumb” resulting from studies  
10 in which the computer processing of the data was somehow upset because data processing  
11 violated some internal programming norm in the algorithm. The result was that the data in  
12 some cases could not be processed in their entirety. Hence, that number triggers concerns.

13           The next significant concern involves the statistical properties of parameters which are  
14 calculated from an imputed record. The major danger is that the calculations generate artifact  
15 results for these properties. When data are imputed, the resulting record may calculate  
16 statistical properties of the data set which do not reflect reality either by suggesting things  
17 which are known not to be present, and/or omitting things which are known to be part of the  
18 system and should have been revealed, but were not. The larger the record requiring imputation  
19 and the higher the percentage of that record which has such data substitution, the greater the  
20 chance of artifacts.  
21  
22

23           The previous concern raises the question of even recognizing and knowing when one  
24 has an artifact. This partly subsumes the question of outliers. Since the outlier question already  
25 arose in the discussions, much of the rest of this material will address the outlier problem. Is  
26 the datum really an outlier, or a legitimate member of the data set being explored? Does it

1 show up as a statistically rare but possible extreme value, or is something that might be  
2 considered more routine under other circumstances? Is it a technical mistake that can be  
3 corrected? Is the supposed outlier a true artifact, in that it is strictly a result of or singled out in  
4 the calculations?

5 Rosemont's consultants tried to removed as an outlier a particulate matter datum from  
6 further calculations. ADEQ required under EPA rules that this possible outlier datum be used,  
7 and Rosemont acceded. Still, Rosemont's consultants continued to argue as late as the summer  
8 of 2012 that this datum should not be used in any calculations or modeling requirements. They  
9 cited a Weibull distribution analysis to assist in providing justification to disallow this datum.  
10

11 However, because the particular setting which surrounded this datum was not well  
12 described, it is unclear whether the datum is an artifact, an outlier, an equipment or  
13 measurement mistake, or a legitimate datum. Without that information, there is simply no  
14 justification to remove the datum from use, and ADEQ properly retained it. If that datum had  
15 been disallowed, Rosemont's theoretical "ideal" data run on particulate matter as presented in  
16 their submission in the background studies would not have had a potential glitch. This situation  
17 makes the following important point: *Rosemont's quality assurance plan failed.*  
18

### 19 **Extreme Value Statistics Is a Reliable and Scientifically Justified Way of Handling Certain** 20 **Rosemont Data**

21 Rosemont's consultants use of Weibull distributions to analyze a possible outlier datum  
22 provides a good transition to the issue of extreme value statistics. Weibull distributions are  
23 typically studied in extreme value statistics, but here the parameter that should have been  
24 studied is wind velocity, and not particulate matter. Here, ADEQ has unreasonably failed to  
25 undertake such statistical studies and has not required them.  
26

ADEQ's basic – but flawed -- argument is the claim that they have no guidance from

1 EPA on the subject, and that modeling using AERMOD as the platform does not accommodate  
2 extreme value data, but uses highly smoothed data, notably hourly, daily, monthly or yearly  
3 average values of dispersion parameters, depending on the nature of the calculation. Since  
4 modeling dispersion and transport using the AERMOD modeling platform is a basic permit  
5 requirement, the issue is now whether one needs to go beyond this modeling platform to  
6 accommodate the exceptional conditions at Rosemont's site with additional or supplemental  
7 modeling because many of the climatological conditions associated with Rosemont site do not  
8 fit into the mold of AERMOD modeling.  
9

10 Extreme value statistics would have clarified whether extreme weather data at the  
11 Rosemont site is part of the normal climate regime of the site or unusual. If normal, then the  
12 provision for suspension of dust control processes on the dry stack disposal basically guarantee  
13 a potential to emit hazardous pollutants. If unusual, the potential to emit is less clear with  
14 respect to periods of suspension of dust control, because HAPs emissions might not occur with  
15 a frequency that would raise concern.  
16

17 Appellant noted in comments on the draft permit that if 10% of the climate data showed  
18 extreme value properties, extreme value statistical methods would have shown that these  
19 numbers were a natural part of the data set and not outliers or extreme values. That roughly  
20 translated into observations of extreme data in climate and meteorological parameters for 36  
21 days of the year. Seasonal wind storms and the monsoons come into play here.  
22

23 Recent data from the Pima County with respect to possible air quality violations from  
24 airborne particulate during dust storms gives further credence to these concerns. Data from  
25 nearby federal lands over the period of record of Rosemont's background studies showed that  
26 such data often were obtained as much as 100 or more days of the year. ADEQ questioned  
that notion, but did not rebut it. Rather they merely indicated that they had no guidance in the

1 matter, and AERMOD did not accommodate these data. Here again a data collection program  
2 with more than one station, including stations at higher altitudes, would have provided the  
3 needed information for this work. This further amplifies the need for supplemental modeling.

#### 4 **Deposition of Pollutants in Class I Areas**

5 The rates of wet deposition of air pollutants in protected Class I federal areas depends  
6 on precipitation values. Several critics including this appellant pointed out that Rosemont's use  
7 of precipitation data was faulty and that the visibility analysis performed was inadequate.

8 ADEQ indicated that Rosemont did not use precipitation data and that certain aspects of  
9 visibility modeling, notably the computer platform and models of CALPUFFs do not apply to a  
10 “synthetic minor source.” If, however, the “synthetic minor source” must now have a Class I  
11 air quality permit because of HAPs emissions, this becomes a major deficiency in Rosemont's  
12 application, and will require entire resubmission of its application with appropriate studies.  
13

#### 14 **Conclusion**

15 In sum, there are many demonstrable and fatal technical deficiencies with the Rosemont  
16 studies, and a demonstrable lack of technical expertise and irresponsible and negligent  
17 regulatory oversight by ADEQ in its unreasonable acceptance of these studies, including the  
18 condoning of unprofessional scientific work lacking in support for issuance of the permit.  
19

20 The bottom line is that the data collection, and models and calculations cannot support  
21 the air quality permit because they were flawed and compromised from the start. Under these  
22 circumstances, the issuance of the permit was unreasonable, arbitrary or capricious, and  
23 alternatively resulted in invalid technical conclusions as well. The current air quality permit  
24 must be withdrawn and new studies to correct the deficiencies noted are required along with a  
25 submission for a Class I air quality permit.  
26

1 **IV. ADEQ UNREASONABLY ISSUED THE PERMIT DUE TO POLITICAL**  
2 **INVOLVEMENT OR PRESSURE AND/OR BASED ON FACTORS NOT**  
3 **RELATED TO - OR RELEVANT TO - PROTECTING PUBLIC HEALTH**

4 Evidence and information provided during this appeal, including evidence improperly  
5 withheld by ADEQ provides proof suggesting political involvement or pressure may have  
6 played a role in the above unreasonable or arbitrary decisions, and the evidence provided by  
7 ADEQ further shows that considerations having nothing to do with public health arguably  
8 impacted the agency in relation to its work and issuance of the permit.

9 ADEQ has improperly withheld numerous email communications between Agency  
10 employees and the Governor's employee on the basis, among other things, that such material  
11 was subject to concealment from the public as a deliberative process. Simply put, there is no  
12 such deliberative process public records exemption under Arizona law. *See Rigel Corp. v. State*  
13 *of Arizona*, 234 P.3d 633, 640, at para. 40-41 (App. 2010) (the deliberative process privilege  
14 has not heretofore been adopted in Arizona; declining to adopt privilege because agencies may  
15 not withhold records unless statutorily exempted from public records law); see also *Star*  
16 *Publishing Co. v. Pima County Attorney's Office*, 181 Ariz. 432 (1994). Such withholding of  
17 public records itself may be deemed arbitrary and capricious. (*Star Publishing*, at 434.) In our  
18 context, this improper and capricious withholding of the records supports the inference of  
19 undue regulatory interference in deliberations for political purposes not authorized by law.<sup>1</sup>

20 Appellant has listed the relevant witnesses to such communications and evidence in his  
21 Supplemental Notice of Witnesses and Exhibits filed on June 24, 2013, as 13A-A006-DEQ-  
22 0083.pdf, and may necessitate subpoenas to obtain withheld records or procure such testimony.  
23

24 Appellant makes this argument based on the position of ADEQ and based on the  
25 information about the documents that ADEQ has withheld from the parties, and obviously does  
26 not have the benefit of the actual underlying documents which have been withheld.

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<sup>1</sup> ADEQ withheld some records claiming it was in “the best interest of the state.” Appellant likewise disputes this.



1 This anticipated testimony and evidence is directly relevant on the context surrounding  
2 and the issuance of the permit, especially the context and effect such issues had or may have  
3 had on ADEQ's ultimately arbitrary and unreasonable issuance of the permit, as well as their  
4 unreasonable reliance on unscientific or flawed data or methods in issuing the permit.

5 Arizona environmental policy related to air pollution and ADEQ's mandate can be  
6 found in A.R.S. Section 49-401. The fact that the ADEQ's decisions must be based on the law,  
7 public health, and the following policy, is obvious and cannot be understated.  
8

9 Section 49-401. Declaration of policy.

10 A. The legislature finds and declares that air pollution exists with varying degrees of  
11 severity within the state, such air pollution is potentially and in some cases actually  
12 dangerous to the health of the citizenry, often causes physical discomfort, injury to  
13 property and property values, discourages recreational and other uses of the state's  
14 resources and is esthetically unappealing. The legislature by this act intends to exercise  
15 the police power of this state in a coordinated state-wide program to control present and  
16 future sources of emission of air contaminants to the end that air polluting activities of  
17 every type shall be regulated in a manner that insures the health, safety and general  
18 welfare of all the citizens of the state; protects property values and protects plant and  
19 animal life. The legislature further intends to place primary responsibility for air  
20 pollution control and abatement in the department of environmental quality and the  
21 hearing board created thereunder. However, counties shall have the right to control  
22 local air pollution problems as specifically provided herein.

23 B. It is further declared to be the policy of this state that no further degradation of the  
24 air in the state of Arizona by any industrial polluters shall be tolerated. Those industries  
25 emitting pollutants in the excess of the emission standard set by the director of  
26 environmental quality shall bring their operations into conformity with the standards  
with all due speed. A new industry hereinafter established shall not begin normal  
operation until it has secured a permit attesting that its operation will not cause  
pollution in excess of the standards set by the director of environmental quality.

Furthermore, although the Director of ADEQ serves at the pleasure of the Governor, it  
is actually *the Director*, not the Governor, who is empowered with the statutory directive to  
“administer the Department” in carrying out its overall mission to protect public health. See  
A.R.S. 49-102(B) (“The Director shall administer the Department ....”)

1 ADEQ itself has asserted that the Governor's Office was involved in deliberative  
2 process with ADEQ on the Permit by refusing to release public records and citing a  
3 "deliberative process" public records exemption to releasing numerous emails between staff  
4 and the governor's apparent public relations representative.

5 Such political involvement in the deliberative process of agency decision making on  
6 issuance of a permit is ostensibly *ipso facto* illegal and not otherwise permitted by law or  
7 regulation. This certainly diminishes the expected impartiality of a government agency  
8 involved in issuance of a permit, and the related quasi-judicial functions currently underway.

9  
10 Finally, to the extent the records that were disclosed by ADEQ suggest that ADEQ was  
11 concerned with other matters not applicable to the legal and environmental standards, such as  
12 speed or expediency, and an apparent concern with public image as opposed to public health,  
13 such considerations are similarly wrong and should not have occurred.

14 The evidence disclosed by ADEQ arguably support the view that such improper matters  
15 impacted both the context and deliberative decisional process in an unreasonably and arbitrary  
16 manner, resulting in a permit that is unsupported for all of the factual reasons stated herein.

### 18 CONCLUSION

19 Appellant Fisher is confident, based on the evidence to be presented, that this Court will  
20 conclude that it is more likely than not that the Agency's issuance of the permit under the  
21 circumstances was unreasonable, arbitrary, and/or capricious, and was also based on invalid  
22 technical conclusions, as well as matters not otherwise permitted by Arizona or Federal law.

23 Dated: July 1, 2013

24 RESPECTFULLY SUBMITTED

25 

26 \_\_\_\_\_  
VINCE RABAGO, Attorney for Joel Fisher

1 CERTIFICATE OF SERVICE

2 I certify that the foregoing document was filed  
3 electronically on July 1, 2013, with the OAH,  
4 via the Court's online docketing system by emailing  
5 the document to webmaster@azoah.gov, which  
6 served all parties and counsel electronically:

7 s/ Vince Rabago, Esq.  
8 Vince Rabago  
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