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**DECLARATION OF JOSEPH C. SCALMANINI**

I, Joseph C. Scalmanini, declare as follows:

1. I, Joseph C. Scalmanini, have personal knowledge of the following facts, and if called upon to testify regarding such facts, I could and would competently testify thereto. I am a registered Civil Engineer in California and president of Luhdorff and Scalmanini, Consulting Engineers, Inc. which specializes in geologic, hydrologic and engineering work associated with the investigation, assessment, development and management of groundwater resources throughout California, and which also specializes in water resources engineering work for municipal, agricultural, and industrial water supply throughout California. I have conducted and directed ground-water assessments and investigations, developed and implemented ground-water monitoring and management programs, designed ground-water development projects, and conducted and directed water resources engineering projects throughout California over the last 42 years. Prior to the founding of Luhdorff and Scalmanini, Consulting Engineers in 1980, I was a Development Engineer at the University of California, Davis, where I directed applied research in ground water and taught classes in Hydraulics and Principles of Ground-Water Management; my association with the University continues as an instructor in a University Extension class on Ground-Water Hydrology and Law. A copy of my resume, which accurately states my education and experience, is attached to this declaration as Exhibit 1.

2. I was asked to review the motion by Sheep Creek Water Company for it to be excluded from the Antelope Valley Groundwater Adjudication, including the various related documents and declarations in support of that motion. This Declaration summarizes my comments on, and disagreement with a number of points made in the overall Sheep Creek documents with regard to the locations of Sheep Creek properties, groundwater recharge to those properties, groundwater flow directions relative to those properties, and impacts related to the planned pumping on the Sheep Creek property in Los Angeles County.

1           3.       In contrast to what is claimed in Sheep Creek's **Memorandum of Points and**  
2 **Authorities in Support of Sheep Creeks' Motion to be Excluded from the Antelope Valley**  
3 **Groundwater Adjudication or, in the Alternative, for Recognition of its Prior Rights to the**  
4 **Waters of Sheep Creek** (Sheep Creek Motion, p.3), Sheep Creek Water Company's property in  
5 Los Angeles County and its service area are not located within a single hydrogeologic area or  
6 basin.

7  
8           4.       Sheep Creek's service area, as mapped in its Exhibit A, slightly straddles the  
9 eastern boundary of the El Mirage Valley Groundwater Basin, and is predominantly located east  
10 of the boundary between the El Mirage Valley and Upper Mojave River Valley Groundwater  
11 Basins, (California Department of Water Resources DWR Bulletin 118-2003).

12  
13           5.       Sheep Creek's property in Los Angeles County, as described in the **Declaration of**  
14 **Chris Cummings, General Manager of Sheep Creek Water Company** (Cummings  
15 Declaration), is located in the northeast quarter of Section 24, Township 5 North, Range 8 West,  
16 San Bernardino Base and Meridian. That area abuts the Los Angeles – San Bernardino County  
17 line, on the west side of that line, and overlies the Antelope Valley Groundwater Basin (DWR  
18 Bulletin 118-2003).

19  
20           6.       The respective locations of the Sheep Creek service area, its property in Los  
21 Angeles County, and the underlying groundwater basins as mapped by DWR are all illustrated in  
22 Exhibit 2 to this Declaration.

23  
24           7.       The Jurisdictional Boundary for the Antelope Valley Groundwater Adjudication  
25 was established by the Court in its **Order After Hearing on Jurisdictional Boundaries**  
26 (November 3, 2006). The conclusion in that Order, with some minor local exceptions, was that  
27 the alluvial basin as described in California DWR Bulletin 118-2003 should be the basic  
28 jurisdictional boundary. One local exception in the area of the Sheep Creek property in Los

1 Angeles County was the truncation of DWR's mapped alluvial basin at the Los Angeles -- San  
2 Bernardino County line, where the County line was established as the eastern jurisdictional  
3 boundary since it had previously been established as the western boundary of the Mojave  
4 adjudication.

5  
6 8. The location of the Sheep Creek property in Los Angeles County relative to the  
7 Antelope Valley Jurisdictional Boundary at the Los Angeles -- San Bernardino County line is  
8 illustrated on Exhibit 2 to this Declaration.

9  
10 9. As concluded in Sheep Creek's Motion (p. 17), surface waters and groundwater  
11 recharge from Sheep Creek flow into the El Mirage Groundwater Basin. However, it is incorrect  
12 for that Motion to conclude that the El Mirage Basin is "a hydrogeologically separate and distinct  
13 basin from those in the Antelope Valley Basin". As described by DWR in its Bulletin 118-2003  
14 (Sheep Creek Exhibit E), the easterly and westerly boundaries of the El Mirage Basin are  
15 "alluvial drainage divides extending from the San Gabriel Mountains". Surface drainage divides  
16 do not comprise subsurface hydrogeologic features which, in turn, constitute any kind of  
17 "separate and distinct" groundwater basin from those adjoining it on the west (Antelope Valley  
18 Basin) or east (Upper Mojave River Valley Basin). Absent any significant hydrogeologic  
19 features to substantially retard or impede flow, groundwater is free to move across such mapped  
20 "boundaries" in response to prevailing hydraulic gradients (slope of the water table in an  
21 unconfined aquifer system as present in the El Mirage Valley and immediately adjoining portions  
22 of the Antelope Valley and Upper Mojave River Valley Groundwater Basins).

23  
24 10. Examination of limited groundwater level data and interpretation of that data in the  
25 form of contours of equal groundwater elevation in and near the El Mirage Groundwater Basin  
26 indicate that the predominant groundwater flow directions from the mouth of Sheep Creek are  
27 north to northeast, primarily toward the greater El Mirage Basin and partially toward the Upper  
28 Mojave River Valley Basin. There is no prevailing gradient for groundwater flow from the

1 vicinity of the mouth of Sheep Creek toward Los Angeles County or, more specifically, toward  
2 the Sheep Creek property in Los Angeles County. As described by Dr. Ram Arora,  
3 Hydrogeologist, in his Declaration in support of Sheep Creek's Motion (pg. 3), groundwater flow  
4 directions can be determined from contour maps of equal groundwater elevation; groundwater  
5 flow lines and directions can be delineated at right angles to the contours of equal groundwater  
6 elevation. Exhibit 3 to this Declaration is a contour map of equal groundwater elevations based  
7 on available data for the subject area in and near the El Mirage Valley Groundwater Basin.  
8 Throughout the area from the mouth of Sheep Creek (at the south end of the El Mirage Valley  
9 Groundwater Basin) westerly across the County line, the contours are all aligned east-west, with a  
10 resultant northerly flow direction, essentially parallel to the County line.

11  
12 11. Regardless of mapped "basin boundaries", "jurisdictional boundaries", or the  
13 County line, none of which represents the kind of hydrogeologic feature that would substantially  
14 retard or impede groundwater flow in this particular area, there is no prevailing trend (hydraulic  
15 gradient) for groundwater flow from the vicinity of the mouth of Sheep Creek toward the Sheep  
16 Creek property in Los Angeles County.

17  
18 12. As a result of the preceding, it is incorrect for Sheep Creek's Motion to conclude  
19 (p. 17) that "water that would be extracted on its (Los Angeles County) Property is derivative of  
20 the waters of Sheep Creek".

21  
22 13. Review of the Declaration of Dr. Arora begs several additional questions and  
23 comments. Beginning at page 6, Dr. Arora states that "the source of natural recharge water to the  
24 aquifer beneath the Sheep Creek Water Company properties include: precipitation, Sheep Creek  
25 and Sheep Creek Wash, alluvial fans, and other surface and subsurface sources". Actually, the  
26 only true **source** of natural recharge is precipitation. Sheep Creek, Sheep Creek Wash and  
27 alluvial fans are not "sources" of recharge; they are locations where water that originates as  
28 precipitation infiltrates to become recharge. There is no expansion or explanation by Dr. Arora as

1 to what constitute “other surface and subsurface sources”, so it remains unclear what those might  
2 be; none of the historical or recent technical analyses of the greater Antelope Valley – Mojave  
3 River area identify any “other surface or subsurface sources” of natural groundwater recharge.  
4

5 14. While it is correct that precipitation is the source of natural recharge water to the  
6 aquifer beneath the Sheep Creek properties, there is no support for a conclusion or implication  
7 that recharge from Sheep Creek or Sheep Creek Wash extends to Sheep Creek’s property in Los  
8 Angeles County. As discussed above, limited groundwater elevation data indicate that  
9 groundwater flow from the area of Sheep Creek and Sheep Creek Wash is to the north and  
10 northeast, but Sheep Creek’s property in Los Angeles County is to the west/northwest. There is  
11 no technical support in Dr. Arora’s Declaration and the related exhibits for a conclusion that  
12 groundwater recharge beneath Sheep Creek’s property in Los Angeles County derives from  
13 Sheep Creek or Sheep Creek Wash.  
14

15 15. In paragraph 8c of his Declaration, Dr. Arora reports that “the waters of Swarthout  
16 Creek and Sheep Creek are contained in the El Mirage Valley basin (6-43) which is a  
17 hydrogeologically distinct and separate basin from the Antelope Valley Groundwater Basin”. As  
18 discussed in paragraph 9 above, there is nothing about the east and west boundaries of the El  
19 Mirage Valley Groundwater Basin that renders it hydrogeologically distinct and separate from  
20 either the Antelope Valley Groundwater Basin to the west or the Upper Mojave River  
21 Groundwater Basin to the east.  
22

23 16. Ultimately, Dr. Arora’s statement that “the waters of Swarthout Creek and Sheep  
24 Creek are contained in the El Mirage Basin” is in conflict with his later statement (paragraph 8h)  
25 that “the basin underlying Sheep Creek Water Company’s Sheep Creek (San Bernardino County)  
26 well field and its Phelan service area also underlies its Property in Los Angeles County”.  
27 Groundwater cannot be “contained” in one basin, that is mapped almost entirely in San  
28 Bernardino County, and at the same time occur in a “basin” that underlies properties in both San

1 Bernardino and Los Angeles Counties. Also, as discussed in paragraph 6 above and illustrated in  
2 Exhibit 2 to this Declaration, the Sheep Creek service area and its Los Angeles County property  
3 overlies different groundwater basins.  
4

5 17. In paragraph 8f of his Declaration, Dr. Arora reports that groundwater from a  
6 recharge mound beneath Sheep Creek flows in three directions: a) north; b) northeast; and c)  
7 northwest (in the direction of Sheep Creek's property in Los Angeles County). In his subsequent  
8 paragraph 8g, he similarly reports that "groundwater flows north toward El Mirage Lake, east  
9 toward the Mojave River Basin, and west toward the Antelope Valley Basin". There is no  
10 technical support in Dr. Arora's Declaration and the related exhibits for any groundwater flow  
11 direction, most notably a westerly flow direction toward Los Angeles County. As discussed in  
12 paragraph 10 above, limited available groundwater level data support north and northeast flow  
13 directions, but do not support a conclusion that there is westerly groundwater flow from the  
14 vicinity of Sheep Creek toward the Sheep Creek Water Company property in Los Angeles  
15 County.  
16

17 18. In paragraph 8i through paragraph 8l of his Declaration, Dr. Arora provides certain  
18 useful information about the yield of the recently constructed well on Sheep Creek's property in  
19 Los Angeles County. He uses some of that information to calculate a "Radius of Influence"  
20 around the subject well, i.e. limit of distance within which groundwater pumping would cause a  
21 measurable effect on groundwater levels. After noting that the driller's recommended pumping  
22 capacity would (slightly) decrease his calculated Radius of Influence, Dr. Arora concludes that: a)  
23 the nearest distance from Sheep Creek's Los Angeles County property/well field to the eastern  
24 boundary of the Antelope Valley Groundwater Basin is 4,000 feet (citing Carson & Phillips,  
25 1998); b) "the extraction of water from Sheep Creek Water Company's Los Angeles County  
26 property/well field in the El Mirage Basin would not adversely impact the water supply in  
27 Antelope Valley Groundwater Basin"; and c) in the context of his calculated Radius of Influence  
28 of 1,641 feet, "preliminary inquiry shows that there are no other significant producing wells

1 located in close proximity to the Sheep Creek Water Company's Los Angeles County well field".  
2 Dr. Arora's analysis and conclusions about pumping impacts beg several comments or responses.

3  
4 19. First, the Sheep Creek property/well field in Los Angeles County is **not** in the El  
5 Mirage Valley Groundwater Basin. With two minor exceptions about eight miles and about 15  
6 miles north of the subject Sheep Creek property, mapping of the El Mirage Valley Groundwater  
7 Basin does not extend across the Los Angeles – San Bernardino County line into Los Angeles  
8 County; except for those two areas, all properties and wells in Los Angeles County are not  
9 located in the El Mirage Basin.

10  
11 20. Second, as discussed in paragraphs 3 through 8 herein, and as illustrated in Exhibit  
12 2 to this Declaration, the Sheep Creek property and well in Los Angeles County overlie the  
13 Antelope Valley Groundwater Basin and the Antelope Valley Jurisdictional Area of Adjudication.  
14 Prior mapping of the Antelope Valley Groundwater Basin by Carlson and Phillips (1998), after  
15 Bloyd (1967), has been superseded by DWR's mapping of the Antelope Valley Basin (DWR  
16 Bulletin 118-2003). Distance between the Sheep Creek property and the Carlson-Phillips basin  
17 boundary line (approx. 4,000 ft) no longer counts as a basis for assessing whether the property is  
18 within, or not within, the Antelope Valley Groundwater Basin.

19  
20 21. Third, Dr. Arora uses an antiquated and incomplete method to determine the  
21 Radius of Influence around a pumped well. The method used by Dr. Arora (Sichardt's equation)  
22 is based on empirical observations of steady-state, or equilibrium conditions, and dates from  
23 1930, prior to the development of modern, non-equilibrium theory that recognizes changes in  
24 drawdown and radius of influence with time. Although he notes that a drawdown cone around a  
25 pumped well "will continue to grow until it intercepts a recharge or impermeable boundary" (in  
26 other words, the drawdown cone grows with time), Dr. Arora concludes that "the calculated  
27 radius of influence for the Sheep Creek Water Company's Los Angeles County well field is 1.641  
28 feet". Such a fixed value fails to recognize that the actual radius of influence will be a variable, a

1 function of aquifer parameters (transmissivity and storage coefficient) and time, where time will  
2 be the actual operation of the well, which is not identified.

3  
4 22. Fourth, and most importantly, Dr. Arora applies an incorrect “test” in order to  
5 determine whether Sheep Creek’s pumping would impact the groundwater supply in the Antelope  
6 Valley Groundwater Basin. Impacts of pumping can be grouped into two types or categories: 1)  
7 direct pumping impacts that derive from the hydraulics of groundwater flow around a well; and 2)  
8 basin impacts that derive from the extraction of groundwater from an aquifer and the subsequent  
9 recharge to the aquifer to replace the pumped water. Dr. Arora simply investigates the first type  
10 of impact and concludes that, because preliminary inquiry identified no nearby wells that could be  
11 directly affected by Sheep Creek’s pumping, there would thus be no effects on the entire Basin’s  
12 groundwater supply. From the type of analysis conducted by Dr. Arora, one can only conclude  
13 whether a nearby pumper would be impacted (experience an effect on groundwater level) by the  
14 pumping in question; one cannot conclude from that type of analysis whether or not the water  
15 extracted by Sheep Creek pumping would be replenished (recharged). Sheep Creek did not  
16 analyze whether its planned pumping would be recharged, i.e. whether the yield of the Antelope  
17 Valley Groundwater Basin would support its pumping; and its claims to recharge from Sheep  
18 Creek are invalid as discussed herein.

19  
20 23. It is unclear from the overall Sheep Creek Motion as to how much water it plans to  
21 export from its Los Angeles County property to its service area in San Bernardino County. In  
22 paragraph 8j of his Declaration, Dr. Arora reports that the drilling contractor for a recently  
23 constructed well on the Sheep Creek Los Angeles County property “is recommending  
24 groundwater withdrawal at the rate of 1,200 gpm” (gallons per minute). Theoretically, a well  
25 equipped to pump 1,200 gpm could produce about 1,900 acre-feet per year (afy); typical practice  
26 for municipal wells would suggest that such a well would be operated in a way that annual  
27 production would be about half its theoretical full-time capability. It remains unclear whether  
28 Sheep Creek might construct and operate any additional wells on its Los Angeles County



1 property. Ultimately, however, regardless of the number of wells, pumping capacities, and  
2 operating practices, the water produced on the Sheep Creek property in Los Angeles County  
3 would be fully exported from the jurisdictional area of the Antelope Valley Groundwater Basin to  
4 the Sheep Creek service area in San Bernardino County, with no return flows (e.g. waste water)  
5 from that service area to the Antelope Valley Groundwater Basin. In that respect, the planned  
6 Sheep Creek pumping would be a net extraction of part of the groundwater yield of the Antelope  
7 Valley Area of Adjudication.

8  
9 24. While the amount of groundwater yield in the Antelope Valley Area of  
10 Adjudication (AVAA) is subject to future decision by the Court, my opinion at this stage of the  
11 overall adjudication, based upon technical work to date, is that the yield of the AVAA is  
12 insufficient to support all current pumping in the AVAA. As a result, any new exports from the  
13 AVAA, such as planned from the Sheep Creek property in Los Angeles County, would  
14 exacerbate that shortage.

15  
16 25. To place the groundwater export issue in additional context, a November 19, 2008  
17 letter submitted to the Court by Phelan Piñon Hills Community Services District indicates that its  
18 “principal groundwater production well is apparently located within the boundaries of the land  
19 area subject to the Antelope Valley Groundwater adjudication”. The District stopped short of  
20 identifying the quantity of water produced from that well, but reports that it serves the population  
21 in a 128 square mile area of San Bernardino County (that area would be nearly equal to 10  
22 percent of the entire area of the Antelope Valley Area of Adjudication). Further details about the  
23 possible existing export of groundwater from the Antelope Valley Area of Adjudication by  
24 Phelan Piñon CSD are unknown. However, a partial document included as Exhibit R to the  
25 Sheep Creek Motion (two pages of the Final Draft Phelan/Piñon Hills Community Plan, February  
26 2007) suggests that total water requirements of Sheep Creek Water Company and the surrounding  
27 Phelan/Piñon Hills area exceed 4,000 afy. It is unclear whether, or how much of those water  
28 requirements are being met, or are planned to be met, by exporting groundwater from the

1 Antelope Valley Area of Adjudication. However, as noted in paragraph 24 above, any  
2 groundwater exports from the Antelope Valley Area of Adjudication are of concern in that the  
3 exports represent a net extraction of part of that Area's groundwater yield; and it remains a  
4 factual issue as to whether the basin's yield is sufficient to support all requirements in the AVAA,  
5 let alone any groundwater exports.

6  
7 I declare under penalty of perjury under the laws of the State of California that the  
8 foregoing is true and correct.

9  
10 Executed this 15<sup>th</sup> day of May, 2009, in Sacramento, California.

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14 Joseph C. Scalmanini

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