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**BEFORE THE ARIZONA NAVIGABLE STREAM
ADJUDICATION COMMISSION**

**In re: Determination of Navigability of the
Gila River in Maricopa County**

No. 03-007-NAV

**Maricopa County and The Flood Control
District of Maricopa County's
Memorandum to the Arizona Navigable
Stream Adjudication Commission (ANSAC)
Regarding the Arizona Court of Appeals' De-
cision in the Lower Salt River Case that Re-
sulted in the October 2011 Remand of the
Case to ANSAC**

This Memorandum is submitted by Maricopa County and the Flood Control District of Maricopa County ("County and FCD") by undersigned counsel. The Arizona Navigable Stream Adjudication Commission ("ANSAC" or "Commission") has asked interested parties to submit memorandum describing what they believe the Commission should do to comply with the Court of Appeals' opinion in *State ex rel. Winkleman v. Ariz. Navigable Stream Adjudication Comm'n*, 224 Ariz. 230, 229 P.3d 242 (App. 2010) ("Opinion"). On January 13, 2012, the County and FCD submitted a memorandum to ANSAC on that question with respect to the Lower Salt River. To avoid unnecessary repetition, that memorandum is hereby incorporated into this document. In addition to re-advocating the hearing procedure proposed in the County and FCD's January 13th memorandum, this Memorandum covers evidence of navigability on the Gila River.

The consensus of the several Memoranda submitted on the Lower Salt River appears

to be that a new hearing is needed as well as, at a minimum, post-hearing briefing to respond to any additional evidence submitted at a hearing. The County and FCD concur. The consensus also seems to be that any new hearings should not be scheduled until after the U.S. Supreme Court renders a decision in *PPL Montana v. Montana*. This would avoid any unnecessary expense and repetition of hearings should the high court's decision significantly change the applicable legal framework. The Supreme Court should issue an opinion by the end of Spring 2012, so no significant delay is likely. To the extent no new evidence is presented at the hearing, all parties should be allowed to present their perspective on the evidence, address the weight to be given to different evidence, and to apply the "natural and ordinary" test mandated by the Opinion. Additionally, should ANSAC feel it would be helpful, the County and FCD suggest that oral argument be allowed after the final memoranda are submitted to respond to the contents of those post-hearing documents.

The remainder of this Memorandum summarizes evidence submitted before and at the hearing held on November 16 & 17, 2005 in Phoenix, Arizona. Based on the evidence presented and in light of the Opinion, it is the County and FCD's position that the Gila River was navigable in its "natural and ordinary" condition on February 14, 1912 at least from the confluence with the Salt River.

I. The Proof Of Navigability Presented To The Commission More Than Meets The Statutory Standard And The Requirements Of The Opinion.

In accordance with the Opinion, the Commission should give very little weight to post-diversion, post-development evidence. Only evidence that relates to the Gila River's natural and ordinary condition is relevant to the Commission's determination. The only evidence that was presented that related to the river's natural and ordinary condition was Mr. Hjalmar W. Hjalmarson's report and testimony evaluating the pre-development physical conditions of the river.

Unlike all other experts, Mr. Hjalmarson analyzed the river in its natural and ordinary condition. [ANSAC Hearing Transcript ("TR") 11/17/2005 256:21-25]¹ He testified that based

¹ References to the hearings are cited by "page number:line number(s)".

on his analysis of the hydraulics, hydrology and geomorphology, the river was navigable. His testimony was not refuted.

The goal of Mr. Hjalmarson's study was to estimate the amount and temporal distribution of the natural and ordinary flow in the Gila River from the confluence with the Salt to the Colorado. [TR 11/17/2005 236:14-18] Using data from the U.S. Geological Survey, he calculated the pre-development mean flow rate (2,330 cfs), median flow rate (1,750 cfs), and base flow rate (290 cfs) of the river. [Evidence Log ("EL") #23-Hjalmar W. Hjalmarson, *Navigability Along the Natural Channel of the Gila River* 13-14 (October 25, 2002)] Based on his calculations, Mr. Hjalmarson concluded that the pre-development river was a perennial stream, with an average calculated width of 300', an average depth of 3.1', and velocity of 2.5 mph. [*Id.* at 244:10-22] Mr. Hjalmarson also collected measured width data from the historical Government Land Office ("GLO") survey notes and calculated an average width from those notes as well after adjusting for unknown angles of incidence. [*Id.* at 245:19-248:8] Mr. Hjalmarson's calculated width agreed with the GLO measured average from the surveys. [*Id.* at 248:9-13]

Mr. Hjalmarson testified that based on the natural conditions (e.g. slope, sediment, etc.) the Gila River would return to a single meandering channel when braiding had occurred as the result of a flood. [*Id.* at 279:12-17] Mr. Hjalmarson's conclusion that the natural and ordinary condition of the Gila was a single, meandering channel was supported by Dr. Gary Huckleberry. [TR 11/16/05 57:2-58:7] Drs. Schumm and Huckleberry acknowledged that the Gila River became a wide-braided river as a result of large floods, [TR 11/16/2005 59:13-21; EL #6-Stanley A. Schumm, *Geomorphic Character of the Lower Gila River* 8-9 (2004) ("Schumm Report")], but Dr. Schumm testified that a braided river could revert to a single meandering channel over time if the natural conditions prevailed. [TR 11/17/2005 13:9-14, 34:13-16] The primary reason that the Gila River channel was braided at the time of statehood, was because a previous flood caused the braiding and the natural flow had been diverted, which interrupted the natural and ordinary process of re-establishing a single meandering channel. [TR 11/17/2005 254:22-255:7]

After calculating the physical measurements of the pre-development Gila River, Mr. Hjalmarson then used three federal tests for navigability to determine whether the pre-

development dimensions would permit navigation. [*Id.* at 252:8-254:15] The three tests include: the Bureau of Outdoor Recreation Method; the Fish and Wildlife Method; and a U.S. Geological Survey engineering method developed by Langbein in 1962. Using these three models, Mr. Hjalmarson calculated that the Gila would have been navigable both downstream, and upstream. [*Id.* at 27-29] In addition to its scientific veracity, Mr. Hjalmarson's analysis agrees with other assessments and historical accounts of pre-development navigation on the river discussed below.

Although much of the water that could have supported boating was diverted between 1850 and 1912, there is still ample evidence that boating on the river actually took place during that period. As highlighted by Dr. Donald C. Jackson and listed in the Arizona State Land Department Gila River Study prepared by J.E. Fuller Hydrology & Geomorphology, Inc. entitled *The Arizona Stream Navigability Study for the Gila River: Colorado River Confluence to the Town of Safford* ("*ASLD Navigability Study*"), many people used the river to navigate while diversions were actually happening. The fact that water-borne travel was happening irrespective of the ever-growing diversions reinforces the conclusion that the Gila River was, and remains, susceptible to navigation in its natural and ordinary condition on February 14, 1912.

In the *ASLD Navigability Study*, the authors list many accounts of the river that lead to the conclusion that it was susceptible to navigation before the water was significantly diverted. The first such account describes a party passing through the Gila River basin in November 1697. [EL #2-*ASLD Navigability Study* IV-1] In that account, in order to investigate ruins on the other side of the river, Juan Bautista de Escalante was forced to swim across the river. [*Id.*] A later account by James Ohio Pattie states that while trapping along the lower Gila during December 1827, his party constructed a canoe so that they could trap both sides of the river which he stated was too deep to be forded on horseback. [See Goode P. Davis, Jr., *Man and Wildlife in Arizona: The American Exploration Period 1824-1865* 21 (Neil B. Carmony & David E. Brown eds., 2d ed. 1986)] Another account by John S. Griffin, an army surgeon who traveled with the Kearny (Emory) expedition in 1846, described the Gila below the Salt as about 80 yards wide, three feet deep, and rapid. [*Id.* at 29 (*quoting* J.S. Griffin, *A Doctor Comes to California* 35 (California Historic Soc., San Francisco 1943))] Another member of the expedi-

tion, Henry Smith Turner, noted that the river was from 100 to 150 yards wide, with an average depth of four feet - "quite deep enough to float a steamboat." [*Id.* (quoting H.S. Turner, *The Original Journals of H.S. Turner* (D.L. Clarke, ed. Univ. of Oklahoma Press 1966))]

The *ASLD Navigability Study* lists several other accounts of successful boating trips down the Gila including the Edward Howard party in 1849, the "Yuma or Bust" trip in 1881, and the J.W. Evans trip in 1895. [*ASLD Navigability Study* at IV-2, IV-7, IV-8, 9] The *ASLD Navigability Study* also lists an 1850 account of successfully using small boats on the river to float belongings downstream thereby lightening the loads for wagon teams and a report from an 1853-54 army expedition that reports the river could probably be used to deliver logs from the Mogoyon Mountains. [*ASLD Navigability Study* at IV-3] Dr. Littlefield, an opponent of navigability, acknowledged historical records established that the steamboat, Explorer, was used on the lower Gila for seven years before it was destroyed in a flood on the Colorado. [EL #12-Douglas R. Littlefield, *Assessment of the Navigability of the Gila River Between the Mouth of the Salt River and the Confluence with the Colorado River Prior to and on the Date of Arizona's Statehood February 14, 1912 ("Littlefield Report")* 120 (Nov. 3, 2005)]

The evidence presented in the *ASLD Navigability Study* and by Dr. D.C. Jackson at the hearing demonstrates that under natural, ordinary conditions the river contained enough water to float boats, including a steamboat. Had the water remained in the river and not been unnaturally diverted, it would have remained so. It bears noting, that the Treaty of Guadalupe Hidalgo in 1848 recognized the potential navigability of the Gila. Evidence of later boating support a finding that the river was at least susceptible to navigation at statehood if the diversions had not existed.

In addition to the evidence presented by the parties of historically boating on the river, at the November 2005 hearing non-parties testified about their own modern navigation. For example, Mr. Jon Colby testified that he was employed as an outfitter and guide on the Upper Gila. He stated that he guided groups of people via kayaks, rubber rafts, and canoes through the Gila Box Riparian National Conservation Area managed by the Bureau of Land Management near Safford, AZ. [TR 11/17/2005 331:1-15--339:12] In addition, Mr. Dave Weedman, a biologist with Arizona Fish & Game, testified at the hearing that he had floated

the river gathering information on fish populations. [TR 11/16/2005 211:8-13] Evidence of current boating is probative of the susceptibility of the Gila River's navigability at statehood. *Alaska v. Ahtna, Inc.*, 891 F.2d 1401 (9th Cir. 1989). The fact that boating on the Gila persists to this day, even though the vast majority of the river has long been diverted for agriculture, combined with the historically anecdotes of boating, is strong evidence that before these diversions began the river was navigable in fact.

Finally, Jon Fuller testified at the hearing that based on his research and experience and considering the Federal navigability standard, he thought that the Gila River was navigable from the confluence of the Salt to the Painted Rocks area at the time of statehood. [TR 11/16/2005 120:24-121:22]

The following table summarizes evidence of actual travel on the river.

| Year(s) | Party | Location | Citation |
|--------------|--|--------------|---|
| 1824-27 | James Ohio Pattie | Entire River | ASLD study IV-1 |
| 1846-47 | Mormon Battalion | Lower Gila | ASLD study IV-2 |
| 1849 | Edward Howard Party | Lower Gila | ASLD study IV-2 |
| 1850 | Unknown 49'er letter from "Camp Salvation" | Lower Gila | ASLD study IV-3; Transcript ("TR") 11/16/2005 39:9-15; TR 11/17/2005 209:20-210:5 |
| 1857-64 | Steamboat, "Explorer" | Lower Gila | Littlefield Report 120 |
| 1881 | Cotton and Bingham | Lower Gila | ASLD study IV-7; TR 11/16/2005 39:23-40:1; TR 11/17/2005 210:18-211:3 |
| 1881 | William "Buckey" O'Neill party | Lower Gila | ASLD study IV-7; TR 11/16/2005 39:16-22, 172:23-173:2; TR 11/17/2005 211:4-19 |
| 1895 | Evans and Amos | Entire River | ASLD study IV-8; TR 11/16/2005 40:1-5, TR 11/17/2005 212:2-215:9 |
| 1905 | Jack Shibely | Lower Gila | ASLD study IV-13; TR 11/16/2005 40:13-14, 116:7-20, 215:12-18. |
| 1909 | Stanley Sykes | Entire River | TR 11/16/2005 40:15-16, 106:1-16, |
| 1959 | Three unknown men | Entire River | ASLD study IV-21 |
| 1995-present | Jon Colby-Cimarron Adventure & River Company | Upper Gila | TR 11/17/2005 331:15-332:12 |
| Unknown | Dave Weedman, Fish & Game Biologist | Upper Gila | TR 11/16/2005 211:8-13 |

Notwithstanding that there is ample evidence of actual travel on the Gila, focusing on

historic anecdotes fails to recognize the importance of the susceptibility analysis, which in this case is more important because of significant diversions at statehood. Not one of the presenters at the hearings refuted or even intelligently challenged Mr. Hjalmarson's study proving that the Gila River, at least from the confluence of the Salt to the Colorado, was susceptible to navigation at statehood.

II. Evidence presented by opponents to navigability does not relate to the "natural and ordinary" condition of the river and therefore has very little weight.

A. Dr. Stanley Schumm's report does not support a finding of non-navigability and in fact contains facts which support a finding of navigability.

Dr. Schumm's opinion of non-navigability should be given little weight because it is based solely on the conditions of the river in an un-natural, post diversions condition. [TR 11/17/2005 28:15-28:20, 31:8-11, 50:23-51:4] Dr. Schumm describes the Gila channel as relatively unstable that can shift during floods and that "human activities have significantly altered the Gila River at many locations..." [Schumm Report 3] His conclusion of non-navigability is not based upon the river in its "natural and ordinary" condition. Rather, his conclusion of non-navigability is premised on the channel being in a highly disturbed, depleted condition on February 14, 1912, after three major, extraordinary flood had occurred in the previous two decades.

The evidence cited in Dr. Schumm's report of the river pre-flood and pre-diversion contradicts his opinion of non-navigability. As quoted on page 8 of his report, in 1923 C.P. Ross reported in *The Lower Gila Region, Arizona* that by 1917, a large part of the river was already dry, although small reaches still had water, and **that the position, size, and number of channels change with every flood.** [*Id.* at 8 (emphasis added)] The pre-statehood descriptions of the river compiled by Graf et al. (1994), included in Dr. Schumm's report, are contrary to the ANSAC's finding that the entire Gila River is not navigable. They describe the river was bordered by willows and cottonwoods, the width ranged from 240' to 1300', with 450' the most common estimate, and the depth ranged from 0'-4'. [*Id.*] Dr. Schumm notes an account detailed in Ross's 1923 report by John Montgomery, a rancher, who described the river in the summer of 1889 as a "well-defined channel with hard sloping banks lined with

cottonwoods and bushes.” Mr. Montgomery is also reported as saying that “[t]he water was clear, 5 or 6 feet deep and contained many fish.” Fish do not survive and thrive in a river that has no water.

Dr. Schumm also quotes a U.S. Geological Survey Bulletin entitled *Guidebook of the Western United States*, written by N.H. Darton in 1933 describing the Gila similarly as Mr. Montgomery. Darton is quoted as saying,

The Gila River channel has changed materially in a century or less. When it was originally discovered, there was a well-defined channel with hard banks sustaining cottonwoods and other trees and plants. **The current was swift and deep in places, so that the stream could be navigated by flat boats of moderate size, and it contained sufficient fish to be relied upon as food for many Indians...** Now (1933) the Gila River is depositing sediment in its lower part and its braided course follows many narrow sand-clogged channels.

[*Id.*, at 8. (emphasis added)] This evidence of the river pre-statehood lends support to finding navigability and should be given more weight than later descriptions.

Clearly, the river has changed markedly since irrigation diversion began in earnest in the late 1800s. Dr. Schumm did not analyze whether the river would have been navigable in its natural and ordinary condition (*i.e.*, absent diversions and large extraordinary floods). Therefore, Dr. Schumm’s conclusion that the river is not navigable at the time of statehood should be given less weight. Moreover, his report states that the river was likely navigable before diversions. [*Id.* at 8] ANSAC must carefully evaluate the evidence in the record to determine what weight to assign to each piece in the context of the Opinion’s ruling that evidence of the river in its “natural and ordinary” condition must be given more weight to later evidence.

B. Government Land Office surveys support finding the Gila navigable, or alternatively are ambiguous.

Careful study of the GLO surveyors’ notes reveals that they meandered both banks of the Gila in places. [See *Surveys T4SR4W*, Book 1161, pages 43, 47, and 60; *Surveys T5SR4W* Book 1165 p. 60; TR 11/16/05 130:20-131:1-132:5; *Surveys T5SR5W* Book 1164 pgs. 39, 56, 58] While it is unclear why they did this, it is clear that the survey instructions are inconclusive. We cannot tell from the surveyors’ notes exactly which set of instruction they followed when

surveying the lands abutting the river. Nonetheless, the U.S. Supreme Court held that the surveyors' actions regarding meandering have little significance because surveyors were known to meander both navigable and non-navigable streams and because they were not "clothed with power to settle questions of navigability." *Oklahoma v. Texas*, 258 U.S. 574, 585 (1922).

C. All of the evidence cited by Drs. Littlefield & August relates to the condition of the river after significant diversions of water from the river or its tributaries had already begun.

Dr. Littlefield's report should be given no evidentiary weight because it addresses the river as of 1912, by which time the river was not in its "natural" or "ordinary" condition. [EL #19-Littlefield Deposition 5/25/2001 47:1-25; 131:25-131:7] Dr. Littlefield admitted that the contemporaneous observer reports that he relied upon for his report were of the river in an unnatural and disturbed condition. [*Id.* at 47:20-25, 132:7.] Furthermore, Dr. Littlefield acknowledged that all of the GLO surveys, which his report relies upon, were performed after significant diversions had already taken place. [*Id.* at 134:7] Dr. Littlefield further admitted that diversions affected the river at the time of statehood and that virtually all of the water was diverted by 1902. [*Id.* at 67:9, 146:23] Because Dr. Littlefield was merely repeating the stories told by contemporaneous observers, he did not try to reconstruct the natural river. [*Id.* at 44:1-3, 80:20-81:1] What's more, his credentials do not qualify him to do such a reconstruction. He is neither a hydrologist, nor an engineer trained to do such work.

The conclusion that contemporaneous reports by observers should be given less weight regarding a finding of non-navigability is supported by the fact that first annual report of the Reclamation Service issued in 1903 recognized that irrigation in the Gila Basin had already developed to a point where there was insufficient water for the fields. [*Littlefield Report* 99] Clearly, that is not the "natural and ordinary" condition of the river.

D. Evidence of boating on the river is sufficient to find at least some portions of it susceptible to navigation.

Dr. Littlefield admitted that he has no idea how much water is necessary to make the river navigable. [Littlefield deposition at 150:22, 167:25-168:7] Although he acknowledged

historical records that the steamboat, Explorer, was used on the lower Gila for seven years before it was destroyed in a flood on the Colorado, [Littlefield Report at 120], he has no explanation for why he disregarded that long-term use when he rendered his opinion that the lower Gila was not navigable. [Littlefield Deposition 61:24-63:7] Dr. Littlefield considered boating on the lower Gila a “novelty,” [Id. at 158:18]; however, the evidence presented in the *ASLD Navigability Study* and by Dr. D.C. Jackson at the hearing shows that that river was at least susceptible to navigation at statehood if the diversions had been removed. Surely, seven years of navigation by a steamboat is outside the novelty category.

E. Dr. August’s report fails to demonstrate that the Gila was not navigable.

Just as Dr. Littlefield’s report is flawed by reliance on post-diversion observations, Dr. Jack August’s report is similarly flawed. Any historical information that relates to non-navigability is attributable to the fact that the contemporaneous observers were viewing the river in a depleted condition. It is not surprising that contemporaneous viewers thought the river was not navigable; however, this ignores the rule from *The Daniel Ball*, and the Opinion, that navigability is based on the “natural and ordinary” condition, not a diverted/unnaturally depleted condition. In his report and in his testimony at the hearing, Dr. August references and affirms Dr. Littlefield’s report with respect to the GLO surveys. [EL #17-Expert Witness Report: *The Lower Gila River: A Non-Navigable Stream on February 14, 1912* 10-16; TR 11/16/2005 162:7-19; 198:19-199:6] As addressed above, reliance on the GLO surveys as evidence of non-navigability is questionable at best.

III. Conclusion

The evidence presented opposing a finding of navigability merely shows that the river changed dramatically since significant diversion began and that the contemporaneous observers viewed the river in that un-natural condition. The only evidence presented about the Gila River in pre-settlement, pre-diversion, natural condition was by Winn Hjalmarson. His testimony, along with historical evidence of actual navigation on the river, supports a finding that the river was navigable in its “natural and ordinary” condition, at least from the confluence with the Salt.

Respectfully Submitted this 27th day of January 2012.

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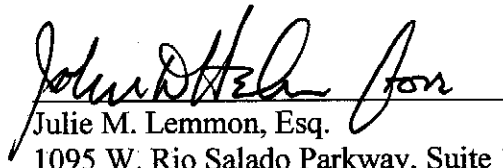
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