Clean Water Act jurisdiction for Little Sycamore Wash, Arizona: Hydrologic connectivity and changing federal regulatory interpretation in the arid western U.S.

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April 26, 2019

Masters project submitted in partial fulfillment of the requirements for the Master of Environmental Management degree in the Nicholas School of the Environment of Duke University

Executive Summary

Infrequent streamflow in arid landscapes presents challenges for determining Clean Water Act (CWA) jurisdiction. Because of such uncertainty, Freeport McMoRan (Freeport) – the second-largest copper producer worldwide – requested an assessment of possible federal jurisdiction for Little Sycamore Wash, a headwater tributary, in Arizona. CWA jurisdiction depends on the definition of "Waters of the United States" (WOTUS), which has been widely interpreted and continuously litigated nationwide. Mining activities impacting the wash would be federally regulated only if it is a WOTUS (referred to here as jurisdictional water) or there is evidence of hydrologic connectivity to a jurisdictional water.

Over the past 40 years, courts and agency interpretation and guidance have shaped the definition of WOTUS, making the scope of jurisdiction broader and narrower as practice changed. Currently there are three definitions of jurisdictional waters that are relevant: 1) pre-2015 practice, shaped primarily by guidances issued by EPA and USACE following Supreme Court cases in the 2000s, 2) the 2015 Obama administration Clean Water Rule (2015 CWR), which broadened the scope of jurisdiction in some cases and aimed to clarify questions of jurisdiction, and 3) the 2019 Trump administration proposed rule (2019 proposed rule), which takes a narrower view of jurisdiction. Due to a complex legal landscape, some parts of the U.S. are subject to pre-2015 practice and some are subject to the 2015 CWR. The 2019 proposed rule is being developed into a final rule as of April 2019, and therefore will also become relevant. Because of these complexities, the jurisdictional status of Little Sycamore Wash depends on which definition is in place.

Furthermore, the way jurisdictional waters are defined in arid landscapes can be problematic, as regulation and practice were generally developed based on humid landscape characteristics and associated assumptions. Physical indicators of channel form, such as Ordinary High Water Mark (OHWM), are not necessarily representative of the same flow regimes in humid and arid landscapes. Because of these difficulties, we use physical flow connectivity to determine possible jurisdiction.

A standard, simplified flow routing model (HEC-HMS) is used to quantify the probability of continuous hydrologic connectivity along the arid stream river network to the closest Traditionally Navigable Water (Santa Maria River to outlet at Alamo Lake by proxy). Modeling results indicate that there is a low level of hydrologic connectivity via stream flow during storm events. When three of the major headwater sub-basins of the Santa Maria experience simultaneous 10-year frequency storms, the river does not discharge to its outlet under realistic field conditions. Based on these results, we estimate that it is unlikely that there is continuous hydrologic connectivity more than once a decade to downstream jurisdictional waters. Based on this lack of connectivity, the wash is unlikely to be considered jurisdictional under past, present, or anticipated future definitions of WOTUS.

The study area is unlikely to be deemed jurisdictional by any version of the rule analyzed or proposed. In order to be jurisdictional Little Sycamore Wash would have to meet these qualifications:

1. **Pre-2015 practice:** Ephemeral streams are jurisdictional depending on a significant nexus test, which consists of case-by-case determination of whether flow function significantly affects chemical, physical, and biological integrity of the TNW (this is current Arizona practice as of April 2019).
2. **2015 CWR:** If flow of the wash contributes flow directly or indirectly to a TNW and the wash is indicated by physical markers of bed, bank, and OHWM.
3. **2019 proposed rule:** If the wash is flowing during the wet time of year or flowing continuously during a typical year.

Arizona is in the process of developing a state program to assume administration of the 404 program. They are in the middle of a stakeholder engagement process. They formed technical working groups on a variety of topics, including Jurisdictional Determinations and the Permits Process. The working groups have written white papers focusing on their technical area with an analysis of the current state, ideal future state, and gaps between the two. Arizona state law requires that the program, if assumed by the state, be no more stringent than the federal program; federal law requires regulation to be no less stringent in states than in the federal government. This would leave Arizona's 404 program exactly the same as federal environmental regulation, and the only aspect that may change for the regulated community is the party to which applications are submitted. Therefore, regardless of whether and how specifically Arizona decides to assume the program, the jurisdictional status of Little Sycamore Wash is unlikely to change.

Although it is not likely that Little Sycamore Wash is a jurisdictional water, Freeport would benefit by investing in additional monitoring gauges to obtain a more accurate depiction of physical hydrologic connectivity in the Santa Maria watershed. This would allow Freeport to make the strongest possible case for whether the wash should be considered jurisdictional and avoid regulatory uncertainty. Freeport should also monitor the Arizona 404 assumption process to stay abreast of any developments that may impact their operations in this uncertain regulatory and political climate.

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1 Introduction

Freeport-McMoRan (Freeport) operates a copper mine in Bagdad, Arizona, roughly 100 miles northwest of Phoenix. Any expansion, development, or disposal activities at this mine must be in accordance with federal laws and regulations. Specifically, an undeveloped parcel of land east of the Bagdad mine may be particularly appealing for future use by Freeport. While there are several regulatory responsibilities associated with the industry, Clean Water Act (CWA) compliance presented unique challenges in this arid region of the United States.

Little Sycamore Wash is the primary aquatic feature in this associated land parcel. This wash is primarily a dry channel and has temporary streamflow following precipitation events. The CWA applies to waters under federal jurisdiction, otherwise known as Waters of the United States (WOTUS). These CWA regulations and programs would apply to the wash if Little Sycamore Wash was deemed jurisdictional. Answering whether this wash is indeed a jurisdictional water is complicated by a complex range of court proceedings, decisions, and agency guidance that have evolved over time. Jurisdictional definitions have incorporated factors of stream flow, permanence, use, and connectivity via physical, chemical, or biological processes. Due to the low flow regime in Little Sycamore Wash, the area required a more critical examination of jurisdiction-determining characteristics and the current interpretation of the definition of jurisdictional waters than would a constantly flowing, perennial river such as the Mississippi or Columbia River.

This report assesses the likelihood that Little Sycamore Wash would be considered a jurisdictional water under the CWA and, specifically, whether Freeport would need to obtain a permit under Section 404 of the CWA if it plans to impact the area. Successful assessment of whether Freeport would require a permit hinges on understanding the hydrologic flows of the wash and the full suite of potential applications of jurisdictional determination.

2 Clean Water Act jurisdiction

2.1 Clean Water Act Section 404

The CWA Section 404 regulated the discharge of dredge and fill materials into WOTUS. Section 404 was implemented jointly by the U.S. Environmental Protection Agency (EPA) and the U.S. Army Corps of Engineers (USACE). USACE maintained day-to-day operations of the 404 program, though EPA had final authority and held veto power over any permit granted by USACE.

The question of whether impacts on Little Sycamore Wash would require a 404 permit depended on whether the wash was a jurisdictional water. The definition of waters of the United States (WOTUS) was key to determining federal jurisdiction over various types of water bodies because of its importance to the definition of "navigable waters" under section 404 of the CWA. This report generally refers to "jurisdictional waters" to describe waters and water features that fall under the definition of WOTUS.

There was some confusion as to what were jurisdictional waters due to frequent changes in definition based on guidance, rule-making, and litigation. As of April 2019 there were three versions of interpretation of WOTUS, meaning jurisdictional waters, which were either in use or were proposed and therefore require explanation. In 2015, the Obama administration issued the Clean Water Rule (2015 CWR) which was a regulation that sought to clarify jurisdiction in some areas and was seen by many as expanding federal jurisdiction. Due to complex legal battles occurring in federal courts, the 2015 CWR was in effect in 22 states (as well as the District of Columbia and the territories of the U.S.) as of April 2019.[1] In the other 28 states, implementation remained as it was before the 2015 CWR (referred to as "pre-2015 practice"). Further complicating matters was the recently proposed "Definition of WOTUS" rule, officially published in the federal register on February 14, 2019 by the Trump administration[2] (referred to as the "2019 proposed rule"). Appendix A contains a summary of definitions of words and phrases under the three different versions of WOTUS interpretation that were relevant as of April 2019 (described in Section 2.2.3).

[1] U.S. Environmental Protection Agency. "Definition of 'Waters of the United States': Rule Status and Litigation Update." September 18, 2018. Accessed February 3, 2019. https://www.epa.gov/wotus-rule/definition-waters-united-states-rule-status-and-litigation-update.

[2] Department of Defense and Environmental Protection Agency, Proposed rule, "Revised Definition of 'Waters of the United States." *Federal Register* 84, no. 31 (February 14, 2019): 4154, https://www.govinfo.gov/content/pkg/FR-2019-02-14/pdf/2019-00791.pdf.

2.2 History of jurisdictional waters

2.2.1 Traditionally navigable waters

In order to understand the current interpretations of jurisdictional waters, it is important to understand the history of the definition through April 2019. The Rivers and Harbors Appropriations Act of 1899 asserted Congress' jurisdiction over the "navigable waters of the United States," which the Supreme Court interpreted to mean "navigable-in-fact," i.e., waters that possessed literal navigability for the purposes of trade and/or travel. Federal courts have determined particular bodies of water to be navigable-in-fact, based on instances of trade and travel, such as fur and cattle trading or exploration in canoes.[3] WOTUS broadened in definition over time, and there have been multiple court opinions addressing its definition.[4]

The 1972 amendments to the CWA referred to "navigable waters" as "waters of the United States, including territorial seas." A waterway is considered "navigable" if it meets any of the tests described in 33 C.F.R. § 329, which is that it is "subject to the ebb and flow of the tide, and/or that it is presently used, or has been used in the past, or may be susceptible for use (with or without reasonable improvements) to transport interstate or foreign commerce." While it was the intention of many members of Congress to give jurisdictional waters the broadest possible interpretation, there has been disagreement over the definition since its inception.

In its definitions, however, USACE adhered to a traditional meaning of "navigable-in-fact" waterways that could be used for commerce. A later definition of "navigable waters" in the USACE regulations of 1975 included wetlands and swamps that were "contiguous or adjacent to other navigable waters" and "artificially created channels and canals used for recreational or navigational purposes that are connected to other navigable waters."[5] USACE argued that under the Commerce Clause of the Constitution, jurisdiction could essentially be given to any water that USACE, as implemented by a District Engineer at USACE, deemed important to protect water quality. This was the era of an expansive definition of jurisdictional waters.

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[3] U.S. Environmental Protection Agency. "Memorandum for JD #2007-5500-LMK." March 3, 2008. https://usace.contentdm.oclc.org/utils/getfile/collection/p16021coll5/id/1427.

[4] Utah v. United States, U.S., (1971). United States v. Appalachian Electric Power Co U.S., (1940); United States v. Holt State Bank, U.S., (1926); Economy Light & Power v. United States, U.S., (1921); The Montello, U.S., (1874).

[5] Mulligan, Stephen P. "Evolution of the Meaning of 'Waters of the United States' in the Clean Water Act." U.S. Library of Congress, Congressional Research Service. March 5, 2019. https://fas.org/sgp/crs/misc/R44585.pdf.

Since both EPA and USACE were charged with administering the CWA, both agencies created their own regulations defining what was under their respective jurisdictions, resulting in uncertainty.[6] The subsequent attention from the public and the media prompted congressional hearings, and a revision of the CWA was issued in 1977. It was later decided that EPA would have the authority to oversee Section 404, while USACE would determine case-specific Section 404 permits.[7] In 1982, the definition of jurisdictional waters was unified in both agencies, and included "all waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce," among other phrases.[8]

The consideration of ecological factors included the ability for tributaries to carry pollutants and flood waters to traditionally navigable waters (TNWs) and the ability of a tributary to provide aquatic habitat that supports a TNW. Non-navigable waters that were not relatively permanent could be determined to be jurisdictional if a significant nexus was found. USACE regulations established that jurisdictional non-wetland waters could use the Ordinary High Water Mark (OHWM) to indicate flow, to determine if there is a significant nexus. This effectively broadened the definition of a jurisdictional water further.

The full definition of a TNW is "those waters that are subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. A determination of navigability, once made, applies laterally over the entire surface of the waterbody, and is not extinguished by later actions or events which impede or destroy navigable capacity" (33 CFR Part 329.4). The precise operational definition of "Navigable Waters" was subject to judicial interpretation; interpretations were defined by the courts and enforced by USACE and EPA.

The most important consideration was that the more TNWs exist in a state or area, the more likely other waters were to be considered jurisdictional. See Section 3.2 for a discussion of TNWs in Arizona.

2.2.2 History of interpretation by the Supreme Court

Early practice under the CWA generally took a broad view of jurisdiction under USACE and EPA administration. However, beginning in the 1980s, a host of Supreme Court cases parsed terms such as "navigable" over the decades, notably, *United States v. Riverside Bayview Homes (1985)*, *SWANCC v. US*

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[6] Ibid.

[7] U.S. Department of the Army and U.S. Environmental Protection Agency. "Memorandum of Agreement: Exemptions Under Section 404(F) of the Clean Water Act." 1989. https://www.epa.gov/cwa-404/memorandum-agreement-exemptions-under-section-404f-clean-water-act.

[8] Mulligan, Stephen P. "Evolution of the Meaning of 'Waters of the United States' in the Clean Water Act." U.S. Library of Congress, Congressional Research Service. March 5, 2019. https://fas.org/sgp/crs/misc/R44585.pdf.

Army Corps of Engineers (2001), and *Rapanos v. United States (2006).* Though each case was an attempt to clarify the jurisdictional reach of the federal government over waters, the result was sometimes inadvertent regulation of land (which is outside the regulatory purview of the federal government). The current situation is a patchwork of precedence in the U.S. concerning water policy.

2.2.2.1 Riverside Bayview

In 1985*, United States v. Riverside Bayview Homes* was the first challenge to the CWA's jurisdiction to come before the Supreme Court. USACE practice considered wetlands adjacent to navigable waters (in this case, a lake) to be jurisdictional, and the Court upheld their authority, emphasizing Congress' intention of broad jurisdiction. However, there was a narrow portion of this seemingly expansive ruling, as the Court offered no opinion on whether USACE was granted authority to regulate non-adjacent wetlands.[9]

After the *Riverside Bayview* decision, USACE and EPA issued the Migratory Bird Rule, wherein they deemed jurisdictional wetlands that were used or may have been used by migrating birds who crossed state lines. The agencies referred to this as a clarification of the CWA which was implemented in lieu of new legislation.[10] As the 1980s went on, the agencies explicitly excluded prior converted cropland, irrigation ditches, stock and swimming pools from jurisdiction.[11]

2.2.2.2 SWANCC

In 2001, *SWANCC v. United States* dealt with wetlands adjacent to navigable waters a second time. It was argued that a jurisdictional water requires a connection to a TNW, which was a limited holding that turned out to be broad in principle. As soon as *SWANCC* was decided, EPA and USACE issued guidance stating that they had the authority to exercise jurisdiction over isolated waters, as long as the use, degradation, and destruction of those waters affected other jurisdictional waters.[12] The two major outcomes from the *SWANCC* case were:

1. The agencies could not use protected bird migration as justification for regulating isolated, non-navigable, intrastate waters. The Migratory Bird Rule was invalidated for wetlands jurisdiction.

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[9] United States v. Riverside Bayview Homes, Inc. 474 U.S., 132-34, (1985).

[10] Mulligan, Stephen P. "Evolution of the Meaning of 'Waters of the United States' in the Clean Water Act." U.S. Library of Congress, Congressional Research Service. March 5, 2019. https://fas.org/sgp/crs/misc/R44585.pdf.

[11] Department of Defense, Final rule, "Regulatory Programs of the Corps of Engineers." *Federal Register* 51, No. 219 (November 13, 1986): 41206, https://www.gsweventcenter.com/Draft_SEIR_References/1986_1113_51_FR_41206.pdf.

[12] Department of Defense and Environmental Protection Agency, Joint memorandum, "Appendix A." *Federal Register* 68, no. 10 (January 15, 2003): 1995, https://www.epa.gov/sites/production/files/2016-04/documents/swancc_guidance_jan_03.pdf. (Appendix B)

2. The case created uncertainty over what other reasoning could be used, as related to possible interstate commerce, to create jurisdiction over isolated, non-navigable, intrastate waters. The reasoning was such that people traveling between states might use the water for recreation, people might capture fish from the water to be sold in another state, or the waters might be used by industries that undertake interstate commerce.

Based on the two facts above, the guidance stated that neither EPA nor USACE would assert jurisdiction over isolated, non-navigable, intrastate waters based on the Migratory Bird Rule, and field staff were required to receive approval from USACE headquarters before asserting jurisdiction over these types of water based on other factors related to interstate commerce listed in the CFR.[13]

Post-SWANCC guidance (Appendix B) also stated that the "Corps and EPA currently define 'adjacent' as 'bordering, contiguous, or neighboring. Wetlands separated from other waters of the United States by manmade dikes or barriers, natural river berms, beach dunes, and the like are 'adjacent wetlands.''[14] The Supreme Court has not defined the term 'adjacent,' nor stated whether the basis for adjacency is geographic proximity or hydrology."

Jurisdiction over tributary systems (and adjacent wetlands) of TNWs was to be made on a case-by-case basis. The 2001 isolated waters guidance, coupled with the SWANCC decision that required a "significant nexus" to a TNW, later influenced the opinion in *Rapanos v. U.S. (2006)*.

2.2.2.3 Rapanos and post-Rapanos guidance

The holding in *Rapanos* was the product of a plurality opinion. Justice Antonin Scalia authored the plurality opinion which defined WOTUS as "relatively permanent, standing, or continuously flowing bodies of water" and stated that wetlands must have a "continuous surface connection" to other jurisdictional waters. Justice Anthony Kennedy concurred, but disagreed with the reasoning. He said that a water significantly affects the chemical, physical, or biological integrity of another "when they function alike and are sufficiently close to function together in affecting downstream waters." Kennedy said USACE should determine, on a case-by-case basis, whether the water in question has a significant nexus to waters that are navigable-in-fact.

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[13] U.S. Environmental Protection Agency, and Department of the Army. "Clean Water Act Jurisdiction Following the U.S. Supreme Court's Decision in Rapanos v. United States & Carabell v. United States." December 2, 2008. https://www.epa.gov/sites/production/files/2016-02/documents/cwa_jurisdiction_following_rapanos120208.pdf. (Appendix C)

[14] Department of Defense and Environmental Protection Agency, Joint memorandum, "Appendix A." *Federal Register* 68, no. 10 (January 15, 2003): 1995, https://www.epa.gov/sites/production/files/2016-04/documents/swancc_guidance_jan_03.pdf. (Appendix B)

Following *Rapanos*, the determination of jurisdictional waters increasingly required scientific evidence to support jurisdiction. After *Rapanos*, EPA decided to codify Kennedy's "significant nexus" test. Under the post-*Rapanos* guidance,[15] if a tributary was chemically, physically, or biologically connected to a TNW, it would be a jurisdictional water. Based on that concept, the "significant nexus" test, wherein a water in question must be shown to have a significant effect on TNW, used a fact-based analysis to determine jurisdiction.

The following waters would be jurisdictional without question and did not require documentation of jurisdictional determination. The post-*Rapanos* guidance named the categories of non-questionable jurisdiction as:[16]

1. TNWs:
    - TNWs are defined as "all waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide."
2. Wetlands adjacent to TNWs:
    - Adjacent is defined as "bordering, contiguous, or neighboring," even if separated by a man-made or natural barrier such as a dike or a dune, or "reasonably close" based on the acknowledgement in *United States v. Riverside Bayview Homes* that USACE may judge that there is an ecological interconnection, and the understanding that the ecological interconnection of the ecosystems, when reasonably close together, is well-established science.
3. Non-navigable tributaries of TNWs that are relatively permanent:
    - "Relatively permanent" is where the tributaries typically flow year-round (for example, except during a drought) or have continuous flow at least seasonally (e.g., typically three months). It is important that the flow in any of these cases is continuous, that is, not intermittent or only in response to precipitation.
4. Wetlands that directly abut such tributaries:
    - "Abut" is defined as not separated by any man-made or natural barrier, having a continuous surface connection.

However, there was often disagreement regarding the definitions of certain terms. In these instances, jurisdiction would be determined based on whether there was a significant nexus to a TNW. The following categories of jurisdictional waters required case-by-case determination and documentation:[17]

1. Non-navigable tributaries that are not relatively permanent
2. Wetlands adjacent to non-navigable tributaries that are not relatively permanent

[15] U.S. Environmental Protection Agency, and Department of the Army. "Clean Water Act Jurisdiction Following the U.S. Supreme Court's Decision in Rapanos v. United States & Carabell v. United States." December 2, 2008. https://www.epa.gov/sites/production/files/2016-02/documents/cwa_jurisdiction_following_rapanos120208.pdf. (Appendix C)
[16] Ibid.
[17] Ibid.

3. Wetlands adjacent to but that do not directly abut a relatively permanent non-navigable tributary

Significant nexus was determined by an analysis of flow (including volume, duration, and frequency) and functions of the tributary and adjacent wetlands. If those functions significantly affected the chemical, physical, and biological integrity of the TNW, there was a significant nexus. Hydrologic and ecological factors were considered as well, such as: proximity to the TNW; size of the watershed; average annual precipitation; potential of tributaries to carry pollutants to TNWs; flood waters, aquatic habitat supporting a TNW; and potential of wetlands to filter pollutants or store flood waters. Swales, erosional features, and ditches generally did not fall under federal jurisdiction, though it is possible that they may have qualified as a point source under other sections of the CWA. Physical indicators of flow used to evaluate a significant nexus included the OHWM, discussed in the regional delineation manuals available on the USACE website.[18]

In practice, the post-*Rapanos* guidance was interpreted as meaning that any water that satisfied *either* the plurality approach *or* the significant nexus test was jurisdictional[19]. Thus, the interpretation broadened further. Despite the ostensibly specific language, it was possible that a water's function or behavior may not have been definitive. Quite often, circumstances called for the definition of jurisdictional waters to depend on the agencies' professional judgement.

Table 1: Important interpretations of CWA, 1985-2015[20]

Date	Action	Key Outcome(s)
1985	*U.S. v. Riverside Bayview Homes*	Wetlands adjacent to jurisdictional waters were also jurisdictional
1985	EPA/USACE begins to use Migratory Bird Rule	Waters used by migratory birds crossing state lines were jurisdictional; Rule formally issued in 1988

[18] U.S. Army Corps of Engineers. "Ordinary High Water Mark (OHWM) Research, Development, and Training." Engineer Research and Development Center. July 09, 2014. Accessed February 16, 2019. https://www.erdc.usace.army.mil/Media/Fact-Sheets/Fact-Sheet-Article-View/Article/486085/ordinary-high-water-mark-ohwm-research-development-and-training/.

[19] U.S. Army Corps of Engineers. *Guidance Highlights for Rapanos and Carabell Decision* (Washington, DC, 2008), 1, https://usace.contentdm.oclc.org/utils/getfile/collection/p16021coll5/id/1421.

[20] Mulligan, Stephen P. "Evolution of the Meaning of 'Waters of the United States' in the Clean Water Act." U.S. Library of Congress, Congressional Research Service. March 5, 2019. https://fas.org/sgp/crs/misc/R44585.pdf.

Date	Action	Key Outcome(s)
January 9, 2001	*SWANCC v. U.S.*	For an isolated water to be jurisdictional, it had to have a significant nexus to a jurisdictional water; Migratory Bird Rule invalidated
January 19, 2001	Post-SWANCC guidance	EPA/USACE had jurisdiction over isolated waters if the use, degradation, and destruction of those waters would affect other jurisdictional waters
2006	*Rapanos v. U.S.*	Kennedy (concurring): a water in question was jurisdictional if it had a significant nexus to a jurisdictional water (a physical, chemical, or biological effect) Scalia (plurality): a water in question was jurisdictional if it was standing, flowing, or had a continuous surface connection to a jurisdictional water
2008	Post-*Rapanos* guidance	A water that *either* had a continuous surface connection *or* passed the significant nexus test was jurisdictional
2015	Clean Water Rule	Obama Administration issued rule codifying that water in question must pass the significant nexus test

2.2.3 Evolution of practice and rulemakings

2.2.3.1 Pre-2015 practice

The Supreme Court cases and subsequent guidances issued, described above and in Table 1, all contributed to the interpretation and implementation of regulations used by EPA and USACE in pre-2015 practice. Some states were technically still operating under pre-2015 practice for determining jurisdiction and some were not, due to the many cases brought in federal courts since the 2015 CWR was promulgated in an effort to supersede pre-2015 practice. (See Section 2.2.3.3 for an explanation of the court cases and the current status of the 2015 CWR.) The current definition of jurisdictional waters that was being used as of April 2019 to determine jurisdiction *outside of the 22 states technically* *operating under the 2015 CWR* (that is, the pre-2015 practice) was codified at 40 CFR 230.3(s) in the 1980s:[21]

"40 CFR 230.3(s) The term waters of the United States means:

1. All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
2. All interstate waters including interstate wetlands;
3. All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters:
    a. Which are or could be used by interstate or foreign travelers for recreational or other purposes; or
    b. From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
    c. Which are used or could be used for industrial purposes by industries in interstate commerce;
4. All impoundments of waters otherwise defined as waters of the United States under this definition;
5. Tributaries of waters identified in paragraphs (s)(1) through (4) of this section;
6. The territorial seas;
7. Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (s)(1) through (6) of this section; waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA (other than cooling ponds as defined in 40 CFR 423.11(m) which also meet the criteria of this definition) are not waters of the United States."

Also note that "prior converted croplands" (determined by USDA, these were former wetlands which were converted into agricultural use by 1985 and met certain requirements of continued use as cropland and maximum days flooding during a growing season) were not considered WOTUS.

2.2.3.2 Clean Water Rule

In 2015, the Obama Administration issued the 2015 CWR, calling it a clarification to supplement the CWA.[22] The 2015 CWR was a regulation promulgated by an executive branch agency, the EPA, not to be confused with the CWA, a statute enacted by Congress. The status of many categories of water was clarified by the 2015 CWR. As the statutory language got more defined and more complex, it became more difficult for the average land manager to understand the need for permits. For example,

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[21] USACE Little Rock District. "What Is the Definition of 'Waters of the United States' & 'Navigable Waters of the United States'?" Accessed April 16, 2019. https://www.swl.usace.army.mil/Portals/50/docs/regulatory/Navigable Waters of the US.pdf.

[22] Department of Defense and Environmental Protection Agency, Final rule, "Clean Water Rule: Definition of "Waters of the United States." *Federal Register* 80, no. 124 (June 29, 2015): 37054, https://www.govinfo.gov/content/pkg/FR-2015-06-29/pdf/2015-13435.pdf.

ephemeral and intermittent waters, if they contributed flow to a TNW *and* had an OHWM, were jurisdictional. Wetlands in a 100-year floodplain or within 1,500 feet of an OHWM would be considered jurisdictional waters. A water that resulted from a direct hydrologic surface connection that was neighboring a TNW, was within the 100-year floodplain of a TNW, or was within 4,000 feet of a jurisdictional water would have been considered a jurisdictional water.

A summary of key changes to the definition of jurisdictional water made by the 2015 CWR was that:[23]

- Wetlands and other waters lacking bed/bank and ordinary high-water mark were removed from the definition of tributaries and placed under adjacent waters, which had a significant nexus;
- The definition of "neighboring" was revised by establishing distance limits;
- The category of "other waters" was eliminated by clarifying jurisdiction over isolated waters, but not asserting jurisdiction by rule. It also identified five specific subregions which were assumed to be similarly situated for purposes of conducting a case-specific significant nexus analysis;
- It allowed for case-specific analysis for all waters within 4,000 feet of an ordinary high-water mark or high tide line of a covered tributary, impoundment, TNW, interstate water, or territorial sea and all waters within the 100-year floodplain of a TNW, interstate water, or territorial sea, whichever was broader;
- It refined proposed exclusions and added features that were not previously excluded (e.g., water distributary systems); and
- It redefined excluded ditches.

2.2.3.3 Lower federal courts' impact on jurisdiction

The 2015 CWR was rescinded by the Trump Administration in 2017, prompting a plethora of challenges to the delay by lower federal courts. As of April 2019, the application of the 2015 CWR had been challenged in six state courts, leaving a patchwork of often-conflicting precedence nationwide. Three federal district courts had issued differing opinions on what actions were covered under the CWA, leading to conflicts in the jurisdictional interpretations and enforcement of the CWA.

EPA and USACE interpretation, implementation, and definitions of section 404 and WOTUS reverted back to pre-2015 practice when the 2015 CWR was stayed by the U.S. Court of Appeals for the Sixth Circuit on August 27, 2015. The Supreme Court case *National Association of Manufacturers v. Department of Defense* (decided January 22, 2018) found that litigation over the 2015 CWR must first be reviewed in federal district court, forcing the Sixth Circuit to vacate the nationwide stay because it was in the wrong jurisdiction, reverting the whole country back to the 2015 CWR. However, EPA then issued

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[23] Adapted from: U.S. Environmental Protection Agency and U.S. Department of the Army. "Economic Analysis of the EPA-Army Clean Water Rule." May 2015. Accessed December 7, 2018. https://www.americanbar.org/content/dam/aba/administrative/environment_energy_resources/resources/wotus/wotus/background/final-rule/2015-05-00 - Economic Analysis for WOTUS Rule (May 2015).pdf.

a final rule on February 6, 2018 delaying the implementation date of the 2015 CWR to February 6, 2020.[24] For a few months this meant that the 2015 CWR was not being implemented anywhere in the U.S.; however, on August 16, 2018, a U.S. District Court in South Carolina struck down that delay rule on the grounds that it violated the Administrative Procedures Act.[25] This reinstated the 2015 CWR in 26 states that did not have a separate injunction or stay on the 2015 CWR. As of April 2019, four of those states (including Arizona) had found a way to block the 2015 CWR, leaving 22 states technically under 2015 CWR implementation (Figure 1).

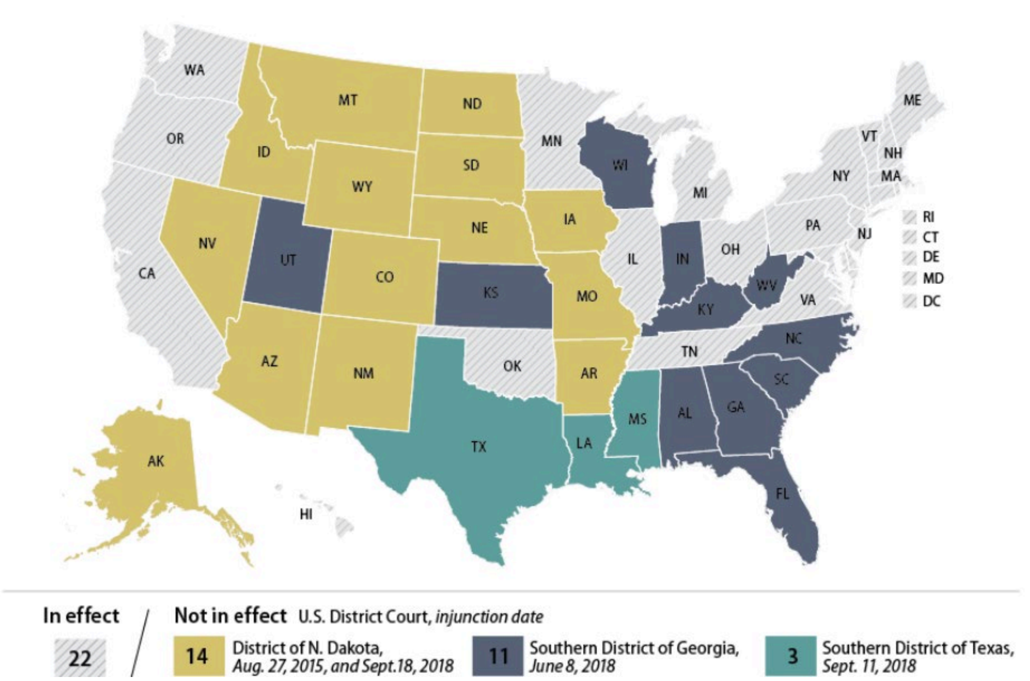

Figure 1: Map of Clean Water Rule stays and injunctions, December 2018[26]

2.2.3.3.1 Circuit courts

The 9th Circuit determined that the CWA did cover wells leading to navigable waters. It also defended the significant nexus definition of WOTUS in a 2017 case where a small Montana mining operation received a criminal conviction for discharges into WOTUS (*United States v. Robertson).* This could mean that suits brought in the 9th District will be subject to the broader interpretation of WOTUS, disregarding Scalia's more restrictive test in his *Rapanos* opinion. In *National Association of Manufacturers v. Dept. of*

[24] Department of Defense and Environmental Protection Agency, Final rule, "Definition of 'Waters of the United States'—Addition of an Applicability Date to 2015 Clean Water Rule." *Federal Register* 83, no. 25 (February 6, 2018): 5200, https://www.regulations.gov/document?D=EPA-HQ-OW-2017-0644-0708.
[25] American Bar Association. "Waters of the U.S. Rule." November 15, 2018. Accessed February 13, 2019. https://www.americanbar.org/groups/environment_energy_resources/resources/wotus/wotus-rule/.
[26] Gatz, Laura. "Waters of the United States" (WOTUS): Current Status of the 2015 Clean Water Rule. Congressional Research Service. December 12, 2018. https://fas.org/sgp/crs/misc/R45424.pdf.

Defense (2018), the U.S. Supreme Court unanimously decided that challenges to WOTUS must be brought in district courts, and not appeals courts. This opinion leaves WOTUS open to differing interpretations in the various districts in which it has been challenged.

In the 4th Circuit, *Upstate Forever v. Kinder Morgan Energy Partners (2018)* held that the CWA has jurisdiction over pollution (in this case, from a ruptured gas pipeline) that traveled through groundwater to a navigable water. *Sierra Club v. Virginia Electric & Power Company (2018)* held that the coal-fired power plant's settling ponds and landfills did not constitute "point sources"; it also determined that their discharge permits did not regulate the groundwater contamination at issue.

The 6th Circuit reversed a previous district court opinion that a leaking coal ash pond and the Cumberland River constituted a hydrological connection to a protected waterway in *Tennessee Clean Water Network v. Tennessee Valley Authority (2018)*. This decision rejected the "hydrological connection theory" under the CWA. While the 6th Circuit Court of Appeals issued a nationwide stay of the CWR in early 2018, the *Nat'l Ass'n of Mfrs.* decision disallowed challenges through appeals courts. The 11th District had opted to defer to the 6th District's jurisdiction when the challenge was before the Supreme Court.

The 9th Circuit's *United States v. Robertson (2017)* held that the definition of WOTUS in the CWA was not unconstitutionally vague and that the defendant had fair warning of the term; and that the jurisdiction was determined to exist under the "significant nexus" test, upholding the binding precedent from *Northern California River Watch v. City of Healdsburg (2007)*. *Hawaii Wildlife Fund v. County of Maui (2018)* held that the County of Maui was liable for discharges of pollutants into wells, which led to a navigable water (the Pacific Ocean), and that the CWA had provided fair notice of prohibited activities.

As of April 2019, Arizona had taken part in a suit to vacate the 2015 CWR, *North Dakota v. United States EPA* (2015), though the state is subject to 9th Circuit jurisdiction. This could have allowed the resolution of Arizona's regulatory status to be dictated by future rulings in the 9th Circuit. Alternatively, the U.S. Supreme Court could have agreed to hear the cases of the lower courts that issued stays. As of April 2019, the 2019 proposed rule had not been enacted.

2.2.3.3.2 Other considerations

The post-*Rapanos* practice of defining a jurisdictional water as any water that met *either* the plurality test *or* the significant nexus test left a lot of uncertainty in the definition of a jurisdictional water. In the 28 remaining states, the CWA was currently being implemented consistent with pre-2015 practice.

EPA funding to states for enforcement was curtailed by the Trump administration, effectively granting greater autonomy to states while limiting their budgets for enforcement. As states had fewer resources for enforcement, citizen suits became the default regulation. If court orders determined regulation, rather than what was established through agency discretion, the regulated community would have had to deal with uncertain regulatory landscapes or be unaware of changes in practice.

2.2.3.3.3 Status in Arizona

The 2015 CWR was blocked in Arizona as of April 2019 even though Arizona sat within the 9th district. Because it had joined a suit with the District of North Dakota, it was operating under pre-2015 practice.[27] As of April 2019, actions taken by Freeport were subject to pre-2015 practice.

2.2.3.4 2019 Proposed Rule

Under the Trump administration, EPA and USACE published the new proposed rule on February 14, 2019 outlining a new definition of WOTUS (that is, jurisdictional waters) under the CWA.[28] This proposal has asserted that regulation of many waterways and wetlands nationwide will be severely limited. The purported goal of the 2019 proposed rule was to provide more clarity for land managers in determining what was a jurisdictional water. Many businesses, such as land developers, construction, and agricultural operations, would have been affected by changes in permitting, as the new rule was expected to significantly reduce the number of waters subject to regulation in the U.S.

A major component of the 2019 proposed rule is that Kennedy's "significant nexus" test will no longer be used. The rule stated that the agencies were "particularly concerned that the 2015 Rule's reading of Justice Kennedy's significant nexus test exceeds the agencies' authority under the Act."[29] The 2019 proposed rule eliminated the need for USACE to determine jurisdictional waters on a case-by-case basis as they had done under the "significant nexus" test.[30]

If the 2019 Proposed Rule were to be promulgated, only waters meeting strict definitions would have fallen under the jurisdiction of the CWA. Many previously jurisdictional bodies of water, like wetlands and tributaries of jurisdictional waters, were explicitly exempted in the 2019 proposed rule. Inland

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[27] North Dakota v. United States EPA (2015, 6th). https://www.sixthcircuitappellateblog.com/files/2015/10/North-Dakota-v.-United-States-EPA_-2015-U.S.-Dist.-LEXIS-113831.pdf.
[28] Department of Defense and Environmental Protection Agency, Proposed rule, "Revised Definition of 'Waters of the United States." *Federal Register* 84, no. 31 (February 14, 2019): 4154, https://www.govinfo.gov/content/pkg/FR-2019-02-14/pdf/2019-00791.pdf.
[29] Ibid.
[30] Ibid.

waters that were subject to court adjudication, such as groundwater, water-filled depressions, and ditches, were also explicitly exempted from federal jurisdiction.

Groundwater was not jurisdictional water in any instance under the 2019 proposed rule. Disputes surrounding groundwater led to differing opinions in lower courts. The 4th and 9th Circuit courts found that groundwater connected to a TNW was jurisdictional,[31] while another decision in the 4th Circuit determined groundwater to be separate and non-jurisdictional.[32] Groundwater recharge basins constructed in uplands were also excluded.

Tributaries that flow only in response to precipitation were excluded under the 2019 proposed rule. This included ephemeral flows, arroyos, and dry washes since these "features lack the required perennial or intermittent flow regimes to satisfy the tributary definition."[33]

Wetlands were no longer jurisdictional if there was a barrier separating them from a jurisdictional water. Wetlands were required to be linked, in a typical year, by direct hydrologic surface connection to a TNW. The barrier could have been upland, a dike, levee, berm, or a similar structure.

Tributaries would not have been jurisdictional if they flow only in response to a rain or snow event. Only perennial or intermittent tributaries with surface flow connected to a TNW would have been jurisdictional. Tributaries connected to a TNW that continue their flow through a culvert or dam or field of boulders would remain jurisdictional.

Water-filled depressions created in upland incidental for mining or construction activity would have continued to be excluded from jurisdictional waters. (Pre-2015 practice and the 2015 CWR had also excluded mining activity, which includes pits excavated in upland for the purpose of obtaining fill, sand, or gravel.) Ditches would be jurisdictional only if they were used for interstate commerce or were within jurisdictional tributaries or wetlands. Additional exclusions from jurisdiction were stormwater-control features constructed in an upland, and artificially irrigated areas that would revert back to upland if irrigation ceased.

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[31] Hawaii Wildlife Fund v. County of Maui, No. 15-17447 (9th Cir. 2018); Upstate Forever v. Kinder Morgan Energy Partners, LP, No. 17-1640 (4th Cir. 2018).

[32] Tennessee Clean Water Network v. Tennessee Valley Authority, No. 17-6155 (6th Cir. 2018); Sierra Club v. Virginia Electric & Power Company, No. 17-1895 (4th Cir. 2018).

[33] Department of Defense and Environmental Protection Agency, Proposed rule, "Revised Definition of 'Waters of the United States." *Federal Register* 84, no. 31 (February 14, 2019): 4154, https://www.govinfo.gov/content/pkg/FR-2019-02-14/pdf/2019-00791.pdf.

In order to evaluate the jurisdictional status of Little Sycamore Wash, it was necessary to decide if arid streams would generally be considered "ephemeral," i.e., surface water flowing or pooling only in direct response to precipitation (e.g., rain or snow fall), and therefore not jurisdictional. In arid Arizona, precipitation was likely to be the determining factor.

3 Regulatory uncertainty and interpretation of jurisdiction in arid climates

3.1 OHWM and indicators of hydrologic connectivity are different in arid climates

Regulatory uncertainty was abundant due to the many versions of definitions of jurisdictional waters. This was worsened in the arid climate of Arizona. The majority of guidance was based on humid stream science, yet there were substantial differences between the form and function of humid and arid stream channels. For example, the morphology of humid stream channels is known to be closely related to peak-discharges in the channel.[34] In contrast, arid stream channel formation is found to be more related to the duration and volume of a stream pulse.[35] Because of these differences in stream form in response to hydrologic processes, metrics of humid stream delineation may be problematic when used to identify hydrologic connectivity in an arid context.

OHWM was often used to determine jurisdiction. The OHWM mark was a physical indicator of "ordinary" hydrologic flows in a stream. Distinguishing this mark involved field identification of a "line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation."[36] Within arid environments, where fewer flows are perennial or consistent, this clear line on the bank may not have been indicative of usual flow regimes in the same way as humid environments. Vegetation changes and channel bank formation could occur in response to several rare, large, short duration flood events; this has been common during the monsoon season. Therefore, in arid regions, lines on the bank may be representative of a particular storm event rather than an indicator representing the integration of usual storm event flows. Because of these differences in arid and humid regions, distinguishing an OHWM in arid field conditions was nonideal as a tool for stream definition.

3.2 USACE Los Angeles District

USACE split the states into regions for administration of federal regulatory programs. The USACE Los Angeles District consisted of the entire state of Arizona, a large part of Southern California, and a small corner of southeast Nevada. As of April 2019, there were twelve TNWs within Arizona's boundaries.[37]

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[34] Wolman, M. Gordon, and John P. Miller. "Magnitude and Frequency of Forces in Geomorphic Processes." *The Journal of Geology* 68, no. 1 (1960): 54-74. doi:10.1086/626637.
[35] Pickup, G., and R.f. Warner. "Effects of Hydrologic Regime on Magnitude and Frequency of Dominant Discharge." *Journal of Hydrology* 29, no. 1-2 (1976): 51-75. doi:10.1016/0022-1694(76)90005-6.
[36] 33 CFR 328.3(c)(6)
[37] Arizona Department of Environmental Quality Jurisdictional Determination Working Group. "Meeting Summary," November 20, 2018. http://static.azdeq.gov/wqd/rulemaking/404/twg/jd_sum_112018.pdf.

These included Arizona's four case-specific TNWs, which were all designated between March and October 2008. These TNW determinations were made using commercial river operations and historic navigability documentation based on "river flow characteristics," before new guidance was issued in December 2008, post-*Rapanos* decision.

The jurisdictional determinations for these four case-specific TNWs in the LA District were submitted and approved between March 2008 and October 2008, under 33 C.F.R. § 328.3(a)(1), (i.e., "[a]ll waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide.") Determinations in this district were made using frequency, duration, and permanency of flow, i.e., "greater than 100cfs any day of the month or year since 1898."

These four case-specific TNWs in Arizona were relevant to the arid streams of Arizona by the definition of WOTUS, citing commercial recreational activity, current stream flow, and historic navigability under 33 C.F.R. § 328.3(a)(1). The current regulatory determination of TNWs in the Los Angeles District had not changed since 2008.

The four case-specific TNWs in the Los Angeles District were determined on bases of historic and current use, as well as flow volume (Appendix D):

1. The Gila River from Coolidge Dam to Winkleman (March 12, 2008): based on the issuance of permits for commercial river operations.[38]
2. The Gila River from Powers Butte to Gillespie Dam (October 17, 2008): numerous access points on and river flow characteristics indicated the stretch of river was historically navigable.[39]
3. The Santa Cruz River from Tubac Gage Station to Continental Gage Station (May 23, 2008): the portion was navigated by boat in 1951, and monthly data indicated perennial flow.[40]
4. The Santa Cruz River from Roger Road to Pima/Pinal county line (May 23, 2008): determined because the reach had the potential to be used for commercial recreational navigational activities.[41]

The case-specific TNWs in the LA District required the same criteria for determination, though the determinations had to go to the higher level of approval by the South Pacific Division of USACE,[42] the LA

[38] U.S. Army Corps of Engineers. "Regulatory Division Memorandum," March 12, 2008. https://www.spl.usace.army.mil/portals/17/Docs/Regulatory/JD/TNW/GilaRiverTNW_03122008.pdf.
[39] U.S. Army Corps of Engineers. "Memorandum for Commander, Los Angeles District," October 7, 2008. https://www.spl.usace.army.mil/portals/17/Docs/Regulatory/JD/TNW/GilaTNW_10172008.pdf.
[40] U.S. Army Corps of Engineers. "Memorandum for the Record," May 23, 2008. https://www.spl.usace.army.mil/portals/17/Docs/Regulatory/JD/TNW/SantaCruzRiver_TNW_MFR.pdf.
[41] Ibid.
[42] Diebolt, Sally. Biologist, Army Corps of Engineers, personal communication in phone call, September 26, 2018.

District's regional office. It was also possible to appeal the approved jurisdictional determinations,[43] though there had not been any TNW revocations in the LA District as of April 2019.

It was reasonably predictable that the determination of TNWs in the Los Angeles District would occur infrequently. In addition, it was likely that TNW determination occurred only in response to changes in the USACE Jurisdictional Determination Form Instructional Guidebook. Therefore, it was likely that no new determinations would be made before changes in guidelines were released.

However, interpretations were often challenged in state or district courts, and definitions and jurisdictions could have been changed or limited as a result. USACE was sued by a developers' organization in a challenge to USACE's determination of the Santa Cruz River as a TNW in 2009 and 2013.[44] While the suits were unsuccessful, this may have indicated contention between industry and the agencies with jurisdictional authority.

[43] Olson, David. "Corps Regulatory Program: Current Topics." U.S. Army Corps of Engineers. August 19, 2015. http://www.nafsma.org/sites/default/files/shared-files/2015-annual-meeting/olson_NAFSMA%20Corps%20Regulatory%20Current%20Topics_v2.pdf.
[44] Diebolt, Sally. Biologist, Army Corps of Engineers, personal communication in phone call, September 26, 2018.

4 Physical hydrologic connectivity in Little Sycamore Wash

4.1 Key finding

Physical hydrologic connectivity was the most consistent indicator of what constitutes a jurisdictional water under past, present, and likely future definitions of WOTUS. Little Sycamore Wash was not found to exhibit physical hydrologic connectivity to the closest TNW as evidenced by available data analysis and modeled conditions.

4.2 Description of the study area

4.2.1 Geographic context

The study area focused on the Little Sycamore Wash, a tributary of the Santa Maria River (Figure 2). Little Sycamore Wash originated in the mountainous northwestern region of Arizona, approximately 100 miles northwest of Phoenix and approximately 150 miles southeast of Las Vegas. The study area spanned portions of La Paz, Mohave and Yavapai counties, with the majority of the watershed residing in Yavapai County.

The harsh desert environment has deterred significant development and the area was sparsely inhabited. Land cover in the area was dominantly sand and fine rock sediments with occasional small pockets of agriculture in the major valleys. Freeport's Bagdad copper mine was the dominant industry in the area.

The closest downstream TNW was the Colorado River. For waters originating in the Little Sycamore Wash watershed catchment, the journey to this junction with the TNW followed this pathway: Little Sycamore Wash emptied into the Santa Maria River; the Santa Maria River joined the Big Sandy River immediately prior to discharge into Alamo Lake, a USACE reservoir; Alamo Lake released into the Bill Williams River, which in turn discharged into Lake Havasu. Lake Havasu was a dammed portion of the Colorado River along the western Arizona border with California. The linear distance in river miles from the wash to the TNW was approximately 75 miles.

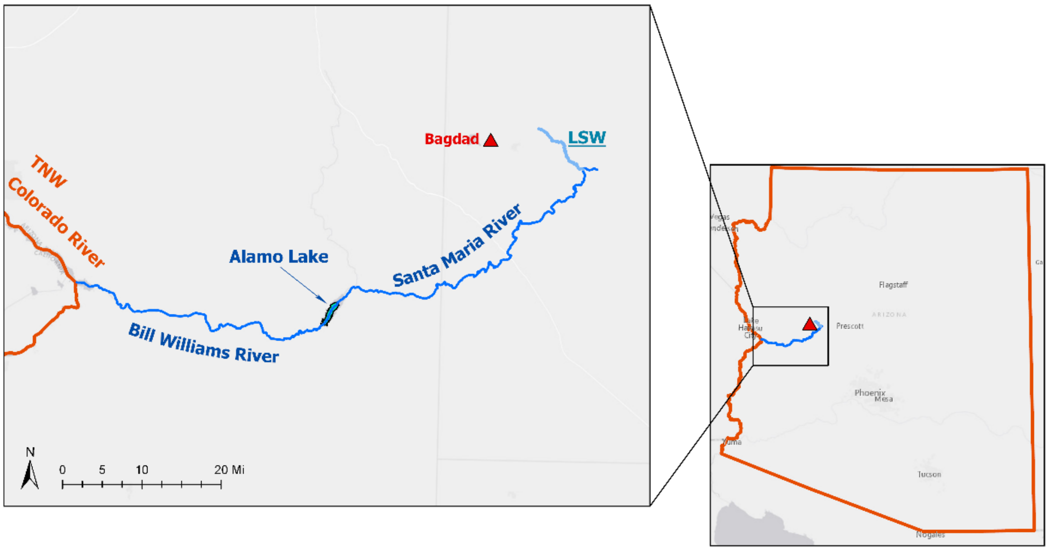

Figure 2: Downstream flow from Little Sycamore Wash (LSW) to the closest TNW. Inset map of the state of Arizona.

4.2.2 Physical description

The Little Sycamore Wash watershed was a sub-basin of the Santa Maria River watershed. The mean elevation was 3,725 feet above sea level. The highest point was 7,168 feet above sea level, along the eastern ridge of the Bradshaw Mountains in the Kirkland Creek sub-basin. The confluence of the Santa Maria and Big Sandy rivers was the lowest point of the watershed, at 1,237 feet above sea level. The Santa Maria watershed area was 1,432.6 square miles (Figure 3). The Little Sycamore Wash watershed area was 22 square miles, representing only 2% of the Santa Maria's watershed.

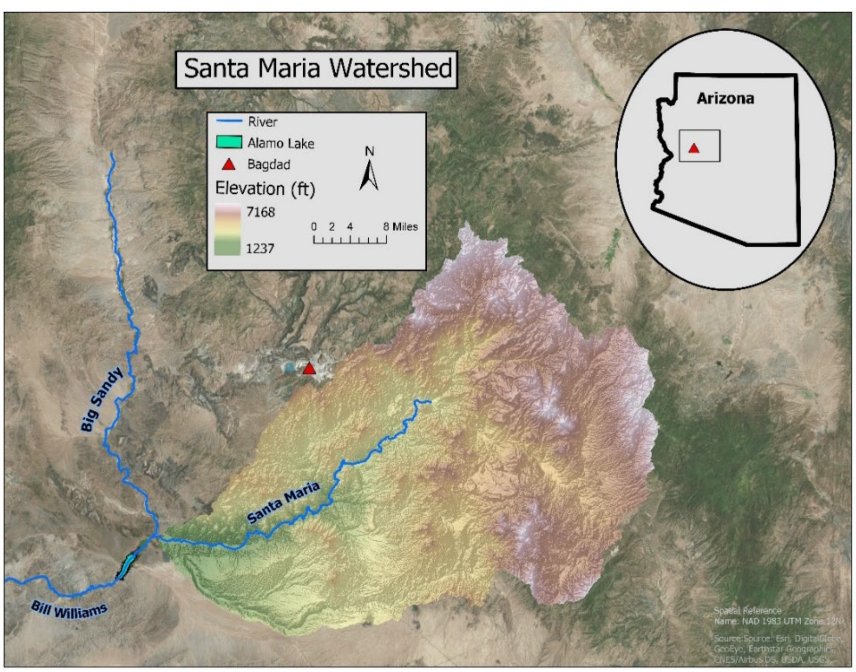

Figure 3: Map of Santa Maria Watershed study area

The Santa Maria River was an intermittent-ephemeral, 24-mile river in west-central Arizona. The majority of surface water in the river was derived from tributaries in the most distal, headwater regions.[45] Notably, Little Sycamore Wash, Sycamore Creek, and Kirkland Creek were three headwater tributaries contributing to the first 3 miles of the Santa Maria. Little Sycamore Wash's catchment had the smallest contributing area and was closest to the town of Bagdad.

Groundwater in the area was controlled by the basin and range geology and was limited in its impact to surface water flows due to the locally dispersed and isolated nature of the basin-fill aquifers. Surface water contributed to groundwater recharge and many reaches of the Santa Maria River were "losing streams," where surface water positively contributes to groundwater recharge through infiltration at the stream bed and banks.[46]

The highest temperatures occurred in June through August, with averages above 80° F and maximums over 100° F. The lowest temperatures occurred November through March, with averages below 50° F and minimums below 20° F. The region experienced large daily variations in temperature due to its relatively high altitude and the strong influence of the sun. Daily temperature variations could be as much as 43° F degrees with a mean variation of 18° F.[47]

Annual rainfall was highly variable in the study area. Over the past decade at Bagdad Airport, maximum annual rainfall was 18.54 inches in water year 2017, and a minimum of 5.59 inches in water year 2009. The average annual rainfall for the Little Sycamore Wash watershed was 13.6 inches.[48] The majority of precipitation events that led to runoff and contributed to streamflow occurred as long duration, low intensity late-winter and spring storms. Over the past 10 years at the Bagdad Airport weather station, precipitation was most prevalent February through June (Appendix E).

4.2.3 Observed streamflow

Streams such as the Santa Maria River and Little Sycamore Wash have not always flowed. The USGS had maintained a streamflow gage station on the Santa Maria River since 1966.[49] Over the past fifty years

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[45] Klawon, Jeanne. "Hydrology and Geomorphology of the Santa Maria And Big Sandy Rivers and Burro Creek, Western Arizona." *Arizona Geological Survey*, 2000. http://repository.azgs.az.gov/uri_gin/azgs/dlio/1055.

[46] Arizona Department of Water Resources. "Bill Williams Basin." *Arizona Water Atlas* no.4 (2010). http://www.azwater.gov/AzDWR/StatewidePlanning/WaterAtlas/UpperColoradoRiver/documents/Volume_4_BWM_final.pdf.

[47] PRISM Climate Group, "PRISM Climate Data." Oregon State University. June 2018. http://www.prism.oregonstate.edu/.

[48] Ibid.

[49] A previous USGS Santa Maria River gaging station existed farther downstream (1939-1966), however was discontinued after the Alamo Lake reservoir was created.

the Santa Maria averaged 266 no flow days a year at this gage site. Two USGS monitoring stations were placed along Little Sycamore Wash in 2016. Through the end of 2018, the downstream Little Sycamore Wash gage registered an average 322 no flow days a year. The three overlapping years of streamflow data show that Little Sycamore Wash occasionally had streamflow when the Santa Maria River did not (Appendix F).

4.3 Modeling physical hydrologic connectivity

4.3.1 Model purpose

The conditions under which Little Sycamore Wash had a physical flow connection to the closest TNW, the Colorado River, had to be identified. Due to nearly constant dam-controlled outflows from Alamo Lake into the intermittent Bill Williams River, which meets the Colorado River, it was conservatively assumed that a hydrologic connection to the outfall at Alamo Lake would also constitute a hydrologic connection to the Colorado River. Hydrologic modeling simulated how much streamflow originating in three major headwater sub-basins of the Santa Maria reached the downstream outlet during a large 'worst-case' storm event to indicate a continuous flow connection (Figure 4).

The largest streamflow and floods in western and central Arizona occurred during winter storms characterized by wide spread, low intensity precipitation.[50] With this understanding, modeling flow events initiated only by storms over the Little Sycamore Wash basin would be inaccurate when exploring the occasions of greatest flow and likelihood of connectivity to Alamo Lake. Larger flows in the Santa Maria would result when all tributaries were generating near-simultaneous peak events, rather than a single tributary receiving a very large, infrequent event. For instance, the largest discharge in the lower Mississippi River would not be when the Ohio River has a 100-year event, but rather, when the Ohio, upper Mississippi, and Missouri Rivers would all be simultaneously moderately peaking.

[50] House, P. Kyle, and Katherine K. Hirschboeck. "Hydroclimatological and Paleohydrological Context of Extreme Winter Flooding in Arizona, 1993." *Storm-Induced Geologic Hazards: Case Histories from the 1992-1993 Winter in Southern California and Arizona Reviews in Engineering Geology*, January 1, 1997, 1-24. doi:10.1130/reg11-p1.

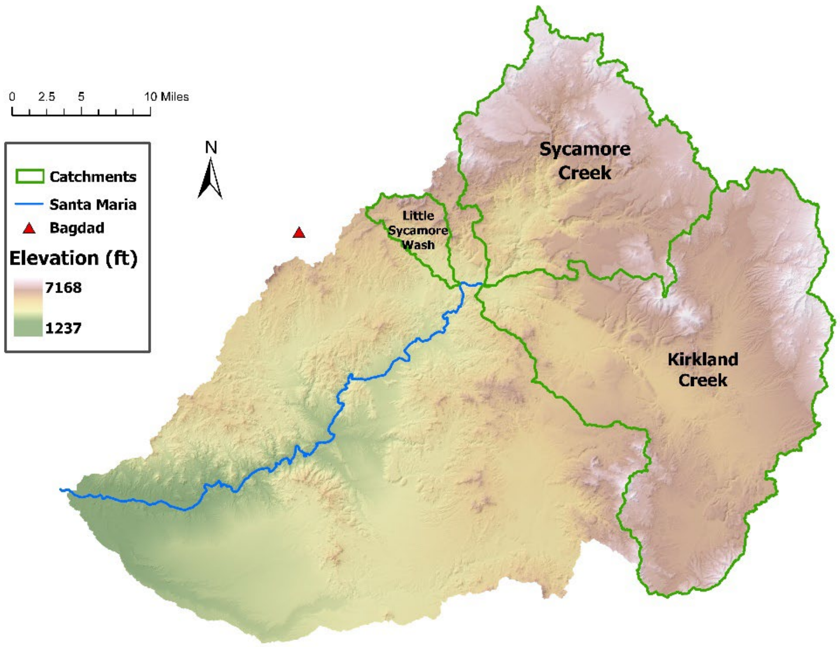

Figure 4: Flow routing study area with the three contributing sub-catchments labeled

4.3.2 Model approach

Inputs to the Santa Maria River were calculated as runoff from 10-year frequency storm events, a storm with a 10% annual chance of occurrence, from each of the three sub-basins. These flows were calculated using National Streamflow Statistics (NSS) equations and lagged by a concentration time value according to the appropriate Arizona Department of Transportation equation (Appendix G). These design storms were calculated based on variables such as location, topography, and local climate for each sub-basin.

For quantitative route modeling, the Army Corps of Engineers' Hydrologic Engineering Center – Hydrologic Modeling System (HEC-HMS) software was used because it is recommended as the state standard for hydrologic modeling by the Arizona Department of Water Resources.[51] The HEC-HMS model routes theoretical storm runoff through a river network. In this analysis, the Muskingum-Cunge channel routing method was used. A key reason in choosing this routing method was that it includes calculation of water contact area with the streambed, which is essential to controlled analysis of transmission losses that are important to consider in arid streams.

[51] Arizona Department of Water Resources. "State Standard for Hydrologic Modeling Guidelines." August 2007. https://new.azwater.gov/sites/default/files/Hydrology_State_Standard.pdf.

4.3.2.1 Channel geometry

The Santa Maria's channel geometry was represented as a rectangle with attributes that were determined using satellite and LiDAR imagery. Channel width was approximated using 3D profiles taken from a digital elevation model (DEM) at 20 cross-sections equally spaced along the river and corroborated using a visual check of vegetation and terrain change in satellite imagery. Features such as stream slope and length were calculated from the DEM, and hydraulic roughness coefficients chosen as corresponding to standard tables of soil composition (Appendix H).

4.3.2.2 Channel transmission

One of the central controls on hydrologic connectivity in arid landscapes was transmissions losses, i.e., percolation of flow into the bed of the river. Because the Santa Maria River was a losing stream and above groundwater, such losses should be expected. Moreover, because the substrate of the bed was quite coarse (sand and gravel), these losses could be quite high. Hydrologic routing models in arid landscapes are quite sensitive to values of transmission/percolation and exact loss rates vary depending on factors such as antecedent moisture conditions, channel material, and geometry along the river. Therefore, to capture the range of variability, this model used a range of values based on hydrologic standards for Arizona (Table 2). A variety of percolation values, ranging from 0 to 6 cfs water loss per acre of channel bed contact, were run as scenarios for the flow routing model.

Table 2: Percolation rates for various channel bed materials as recommended in standards for hydrologic modeling in Arizona (Arizona Department of Water Resources, 2007, Table 4.1); note, adapted from SCS National Engineering Handbook, Section 4, Chapter 19, Transmission Losses.)

Bed Material	Transmission Loss Class	Percolation Rate in/hr (~cfs/acre)
Very clean gravel and large sand	Very High	>5
Clean sand and gravel, field conditions	High	2.0-5.0
Sand and gravel mixture with low silt-clay content	Moderately High	1.0-3.0
Sand and gravel mixture with high silt-clay content	Moderately High	0.25 -1.0
Consolidated bed material high silt-clay content	Insignificant to Low	0.0001-0.10

4.3.3 Model results

Modeling indicated that when all three tributaries (contributing area = 663 mi^2) simultaneously receive rainfall at the scale of a 10-yr frequency storm, there was continuous flow through the river network to

Alamo Lake only when percolation values were 3 cfs/acre or less. Under these conditions, a very small amount of the generated flow reached the outlet of the watershed (~1.8 acre-feet total). If only two of the sub-basins receive precipitation, continued discharge to the watershed outlet occurred only with percolation values of 1 cfs/acre or less. If only one tributary is flowing at a 10-year event, its discharge does not realistically reach the outlet of the watershed at Alamo Lake (Table 3).

Table 3: Alamo Lake connected streamflow volume under various transmission value scenarios when one, two, or three catchments experience 10-year recurrence event storm events. Highlighted are scenarios when streamflow is connected.

Percolation (cfs/acre)	***One Catchment***	***Two Catchments***	***Three Catchments***
	Outflow Volume (ac-ft)		
0	494	2898	7817
0.5	0	943	4729
1	0	151.3	2912
1.5	0	0	1545
2	0	0	586
2.5	0	0	54.8
3	0	0	1.8
3.5	0	0	0
4	0	0	0
4.5	0	0	0
5	0	0	0
5.5	0	0	0
6	0	0	0

In summary, modeled flows indicated Little Sycamore Wash was *connected* to the closest TNW if...

10 year recurrence storms occurred in the watersheds of...	*AND Transmission Values in the Santa Maria are LESS than...*
Little Sycamore Wash	0.5 cfs/acre
Little Sycamore Wash & Sycamore Creek	1.5 cfs/acre
Little Sycamore Wash, Sycamore Creek, & Kirkland Creek	3.5 cfs/acre

4.3.4 Considerations for model interpretation

4.3.4.1 Realistic transmission values

The range of realistic transmission values for this area were highly dependent on the make-up of the stream bed. Using soil surveys by the USDA, soil types were identified within a 100m buffer distance from the Santa Maria River's USGS defined centerline. These soil types included a substantial proportion of sandy and gravelly textured soils, and the main components are summarized in Table 4. Saturated hydraulic conductivity equivalent to 1-3 cfs/acre was reasonable for these sediment types. Important to note is that saturated hydraulic conductivity is a measure of water's velocity moving through the sediment when already entirely saturated with water. Due to the lack of baseflow through most of the stream, initial transmission would occur at a faster rate into dry stream beds.

From these soil surveys we can approximate the initial transmission loss per unit area.[52] Referring back to the Arizona Department of Water Resources recommended transmission rate standards in Table 2, these sediment types were representative of transmission classes that encompass sand and gravel bed material with very little clay. The range of transmission values for these classes ranged from 1 to greater than 5 cfs/acre.

Table 4: Proportion of soil type within 100m of the Santa Maria River that covers greater than 5% of land area

Soil ID	***Name***	***Area (m²)***	***Area (%)***	***Saturated hydraulic conductivity class***	***Representative soil description***
Sa	Sandy and Gravelly Alluvial Land	4317741.0	26.8	NA	sandy and gravelly
CrF	Cellar Soils, 20-60% slopes	3215851.5	20.0	low	very stony sandy loam, very gravelly loam
72	Lagunita-Ripley complex, 0-3% slopes	2197509.2	13.6	moderately High	coarse sand and loamy sand
NOTCOM	No digital Data Available	1839534.4	11.4	NA	NA
Rr	Rock land, low rainfall	1656666.5	10.3	NA	NA
BmF	Barkerville cobbly sandy loam, 20-60% slopes	1149575.5	7.1	moderately low	cobbly sandy loam, very gravelly loamy sand

4.3.4.2 Channel width variation

The width of the stream bed, as input to the model, had an influence on streamflow volume by controlling the amount of surface area available for transmission. The model flow output was proportionately affected by changes to width, although changes of 20% were necessary in order to realistically affect the range of percolation values that control connectivity (Appendix I). During large, rare storm events overbank flow is very likely in the lower portions of the Santa Maria that have low

[52] Graf, William L. *Fluvial Processes in Dryland Rivers*. Caldwell: Blackburnm Press, 2002.

slopes and wide floodplains. Modeling assumptions of entirely channelized flow is then a conservative estimate of stream width due to a realistic lack of isolation to the stream channel.

4.3.5 Model interpretation

Modeling indicated Little Sycamore Wash was not hydrologically connected to a TNW during a large 10% annual chance of occurrence storm if transmission values were greater than 3 cfs/acre on average. Stream bed transmission values have not been physically measured throughout the Santa Maria River. The most likely transmission values for the river fall conservatively fall around 3 cfs/acre. Little Sycamore Wash was not connected by physical streamflow at transmission less than 3 cfs/acre when only it, or two catchments, encounter 10-yr storms. Therefore, for a tributary in this region to be hydrologically connected to the watershed outlet, other tributaries must be simultaneously flooding.

The modeled storms were estimated to be conservative estimates (i.e., large) in that it is unlikely that three tributaries would simultaneously generate 10-year events. Hydrologic conditions in the headwater tributaries of the Santa Maria do not likely have a frequent connection to the outlet of the Santa Maria River at Alamo Lake, and therefore the closest TNW.

4.4 Likelihood of no jurisdiction under any interpretation

Based on the analysis of physical hydrologic connectivity, which showed very little likelihood of any connection between Little Sycamore Wash and the closest TNW, the wash would be unlikely to be determined jurisdictional under the CWA in any of the three relevant definitions of jurisdictional waters. To be jurisdictional under pre-2015 practice, which as of April 2019 was the rule in Arizona, the wash would have to pass a significant nexus test, meaning there would have to be evidence of a chemical, physical, and biological connection to a TNW. This was not the case. To be jurisdictional under the 2015 CWR, the wash would have to contribute flow to a TNW, which it did not, or pass a significant nexus test when combined with similar features in the same region, which based on the model with three catchments, it did not. To be jurisdictional under the 2019 proposed rule, the wash would have to flow at least during the wet time of the year, which it did not.

5 Arizona state actions with potential impact

As of April 2019, Arizona was in the process of assuming administration of the 404 permitting program from USACE. The regulated community in Arizona was unlikely to see major changes in important aspects and jurisdictional determinations other than the party issuing permits, assuming the state successfully assumed the program. However, it may be useful to understand the process the state was going through and the considerations it might have been taking into account.

5.1 State assumption process of CWA Section 404

5.1.1 Assumption requirements

Section 404 (g) (et seq.) of the CWA (Appendix J) laid out the process and requirements for a state that wished to assume administration of the 404 permitting program regulating dredge and fill activities in regulated waters. The complementary regulations were found at 40 CFR 233. A state could submit an application to EPA including proof that state laws established its authority to carry out the program and a description of how it proposed to implement the program. EPA would have reviewed the application and solicited comments from other federal agencies and the public. After this process was complete, EPA would have made the final decision about whether the state could assume administration of the program.[53]

No state program, in order to be approved and continue to administer the 404 program, could implement regulations that are less stringent than federal regulations. They could have chosen to implement regulations that were more stringent than federal regulations. Additionally, EPA retained veto power over any permit that the states issued, just as it would over any permit that USACE issued.[54]

The state had to spend time developing the proposed program before submitting an application. The application required a full description of the state program and proof that state laws provide adequate enforcement authority to properly implement the program. EPA had to review the application, solicit comments on the application from the public and other federal agencies, and approve or deny it within 120 days.[55]

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[53] U.S. Environmental Protection Agency. "State or Tribal Assumption of the Section 404 Permit Program." December 06, 2018. Accessed April 12, 2019. https://www.epa.gov/cwa-404/state-or-tribal-assumption-section-404-permit-program.
[54] Ibid.
[55] Ibid.

Arizona Senate Bill 1493 (SB 1493) established the state's authority to assume the 404 program and stipulated that a state program, if established, must be no more stringent than the federal program. If Arizona chose to assume the 404 program, it would have had to do so before authority established by SB 1493 expired on August 1, 2023.[56]

5.1.2 Changes were likely to be process-oriented only

As noted, Arizona Senate Bill 1493 stated that if Arizona assumed the 404 program, it could not be more stringent than the federal program. EPA could not approve the state program if it was less stringent than the federal program as administered by USACE.[57] Therefore, the 404 program established by the state would have had to be essentially the same as the federal 404 program. The regulated community may have reasonably expected to see no major changes in operations caused by state assumption other than the entity from whom they received jurisdictional determinations and obtain permits.

5.1.3 NEPA

The National Environmental Policy Act (NEPA) required federal agencies to assess the environmental impact of major actions. EPA was generally considered to be exempt from this requirement, since protection of the environment was inherent to its mission. However, USACE was subject to NEPA and USACE was the lead agency in the 404 program.

If Arizona assumed administration of the 404 program, issuing permits would no longer be a federal action subject to NEPA. As of April 2019, when USACE issued a permit under section 404, they had to prepare either an environmental assessment (EA) or an environmental impact statement (EIS). An EA was meant to determine whether a more robust EIS was necessary or that there would be no significant environmental impact. Though NEPA was purely procedural, meaning the agencies did not have to base their decision on the outcome of the EA or EIS, it was seen by many as a valuable public interest review tool, providing awareness of potential environmental impacts to the public.

Arizona had no state equivalent to NEPA as of April 2019, nor did it have specific requirements for public interest review of permits before they were issued. See Section 5.2.2 on the Permit Process working group for more on the discussions about this potential gap were Arizona to assume the 404

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[56] S.B. 1493, Sess. of 2018 (Arizona 2018), https://legiscan.com/AZ/text/SB1493/id/1783662.

[57] U.S. Environmental Protection Agency. "State or Tribal Assumption of the Section 404 Permit Program." December 06, 2018. Accessed April 12, 2019. https://www.epa.gov/cwa-404/state-or-tribal-assumption-section-404-permit-program.

program. Clear information on whether the state was required to adopt an equivalent process to the NEPA review in order to be approved by EPA was not found.

5.2 Working groups

The Arizona Department of Environmental Quality (AZDEQ) established eight technical working groups as part of its stakeholder engagement process. The working groups allowed stakeholders to learn about the process and offer knowledge and feedback, with the goal of making recommendations. It also established an executive working group to coordinate the recommendations of the other technical working groups.[58]

The rosters of each working group are provided in Appendix K. Working group members comprised the spectrum of stakeholders, such as mining interests, development associations, state government, and environmental or conservation advocacy. Based on what stakeholders considered the ideal future state of the program, they tried to help the Arizona Department of Environmental Quality (DEQ) determine the best strategy with which to move forward with the assumption process. The final product from each working group was a white paper, available on the Arizona DEQ's assumption webpage.[59]

5.2.1 Jurisdictional Determinations

The Jurisdictional Determination Working Group was most pertinent to this study. This group assessed the Preliminary Jurisdictional Determination (PJD) and Approved Jurisdictional Determination (AJD) processes.[60] Standout issues included the fact that Jurisdictional Determinations would still be subjective to the person or team conducting them; and that wetland maps differ from agency to agency (e.g., between Fish and Wildlife Service and USACE), allowing the determination of hydric soils to also be variable. There was also no easy way to find the location of previous PJDs, which could create confusion and redundant work in one or multiple agencies.

The working groups also had concerns that the public may not know that USACE has guidance and expectations or may not know they actually have access to regulators. This disconnect could have led to misunderstanding of the definition of jurisdictional water or generated lack of trust in federal agencies.

[58] Arizona Department of Environmental Quality. "Executive Work Group Charter." Accessed February 22, 2019. http://static.azdeq.gov/wqd/rulemaking/404/twg/ex_charter.pdf.

[59] Arizona Department of Environmental Quality. "Clean Water Act § 404 Assumption Rulemaking." February 4, 2019. Accessed April 12, 2019. https://azdeq.gov/cwa-404.

[60] Arizona Department of Environmental Quality. "CWA Section 404 Assumption: Jurisdictional Determinations Technical Work Group White Paper." January 2019. Accessed January 23, 2019. http://static.azdeq.gov/wqd/rulemaking/404/twg/jd_whitepaper.pdf.

One stakeholder expressed concern that the state's performance of jurisdictional determinations would imply or assert jurisdictional applicability of the state over other programs under the CWA. Another concern was that a narrower definition of jurisdictional waters could create a reduction in revenue from jurisdictional determinations, allowing the burden of fees from the state program to fall more heavily on the remaining permittees, while offering no improvement in services**.**

Recommendations from the Jurisdictional Determination Working Group included that an AJD should be valid for more than five years. Under the current policy as of April 2019, an AJD expired after five years.[61] Another key improvement suggested was a list of geographic areas where no jurisdictional waters existed, in order to obviate the need for individual determinations on parcels in those areas. Development of a list could have streamlined the jurisdictional determinations process; however, if the Arizona DEQ sought public review and comment on it, as suggested, the process could have become somewhat less decisive.

The working group also suggested that criteria be established for OHWM appropriate to Arizona ecology, while also developing a "repeatable, defensible process to determine lateral and upstream limits of jurisdiction (e.g., presence of at least two characteristics of an OHWM)."[62] The establishment of a short list of considerations for determining significant nexus was also advised. These particular criteria suggested an adherence closer to pre-2015 practice for jurisdictional determination, which may have had a broader view of jurisdiction than the 2019 proposed rule.

The working group also recognized that constant litigation of jurisdictional waters made assumption difficult. Some group members expressed concern that the state could be squandering resources with these intensive, time-consuming policy revisions, though there was optimism that open negotiation among the relevant state and federal agencies could resolve the difficulties.

5.2.2 Permit Process

The Permit Process working group made recommendations on the topics of permit transition from USACE to Arizona DEQ, general and individual permits, permitting time frames, forms and guidelines,

[61] U.S. Army Corps of Engineers. "Regulatory Guidance Letter No. 05-02." June 14, 2005. Accessed January 19, 2019. https://usace.contentdm.oclc.org/utils/getfile/collection/p16021coll9/id/1246.

[62] Arizona Department of Environmental Quality. "CWA Section 404 Assumption: Jurisdictional Determinations Technical Work Group White Paper." January 2019. Accessed January 23, 2019. http://static.azdeq.gov/wqd/rulemaking/404/twg/jd_whitepaper.pdf.

the public process, federal nexus projects, and the role of EPA.[63] It made many recommendations about how to streamline the permit process with general consensus from the working group. However, the working group did not reach consensus on many of its other recommendations and provided several alternative options for how to achieve certain improvements. Notably, the working group was split on what to recommend for a public interest review process. The option with the most votes was a compromise between the other two options (no public interest review or full replacement of the USACE public interest review process with no exceptions). It suggested implementing a public interest review process that applied "only to certain Waters that may be more likely to involve sensitive public interest considerations (e.g., wetlands, perennial or intermittent Waters, or impacts that may have a significant impact on one or more of the relevant public interest review topics not otherwise addressed by other required permits)."[64] The working group found that this option was similar to the approach that Michigan and New Jersey have taken.

5.2.3 Disagreement among working group members

Though the working groups were not asked to weigh in on whether the state should assume the 404 program, and rather were asked to make recommendations based on an assumption that it would, the Jurisdictional Determinations working group discussed this question many times and chose to provide a summary of those discussions in the white paper. Some themes of the discussions included: whether state assumption would really lower costs to permittees based on the potential for the 2019 proposed rule to decrease the number of permits needed in future (therefore placing the cost burden more heavily on current permittees), uncertainty about the definition of jurisdictional waters making it difficult to properly staff the state program, and whether the added cost to the state would be worth the potential administrative improvements. Some members of the working group believed that partial assumption of the 404 program, while leaving jurisdictional determinations to USACE, was a preferable alternative.[65]

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[63] Arizona Department of Environmental Quality. "Assessment of Permit Process Current State and Recommendations for an Arizona Department of Environmental Quality-Assumed Clean Water Act Section 404 Program: Permit Process Technical Work Group White Paper." March 11, 2019. Accessed March 27, 2019. http://static.azdeq.gov/wqd/rulemaking/404/twg/permit_process_wp.pdf.
[64] Ibid.
[65] Arizona Department of Environmental Quality. "CWA Section 404 Assumption: Jurisdictional Determinations Technical Work Group White Paper." January 2019. Accessed January 23, 2019. http://static.azdeq.gov/wqd/rulemaking/404/twg/jd_whitepaper.pdf.

5.3 Other states' assumption processes

As of April 2019, Michigan and New Jersey were the only states that had assumed the 404 program.[66] Arizona and Florida were actively pursuing assumption of the 404 program. It took Michigan about five years, starting with the state Wetland Protection Act in 1979 (now Part 303 of the Natural Resources and Environmental Protection Act, or NREPA), to assume the 404 permitting program. Michigan wished to consolidate the permitting process for its residents (one fee, one application/permit, simultaneous review) and increase protection of wetlands because it recognized they were dwindling in the state and that they provided valuable services. The Wetlands Protection Act stated that the Michigan legislature found that wetland conservation was a matter of state concern (NREPA Section 324.30302).[67] In Michigan, the Department of Environmental Quality's Water Resources Division ran the program.

Assumption took New Jersey about six years from the time it passed the Freshwater Wetlands Protection Act in 1987, which required the state to work towards assuming the program.[68] This requirement was included in the legislation because developers were unhappy with the process they had to go through to receive permits from USACE.[69] In New Jersey, the Department of Environmental Protection's Division of Land Use Regulation ran the program.

In March 2018, Florida House Bill 7043 became law, establishing the state's authority to assume the 404 program. The Florida Department of Environmental Protection had not published a proposed timeline or set up a webpage for the assumption process as of April 2019, but the issue was under consideration. Unique challenges that Florida may have faced in establishing a program run by the state included determining which waters USACE would retain jurisdiction over. These were generally supposed to be limited to "tidal waters and their adjacent wetlands" and "waters used as a means to transport

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[66] U.S. Environmental Protection Agency. "State or Tribal Assumption of the Section 404 Permit Program." December 6, 2018. Accessed April 12, 2019. https://www.epa.gov/cwa-404/state-or-tribal-assumption-section-404-permit-program.

[67] Michigan Department of Environmental Quality. "Introduction to Michigan's Wetland Program." Accessed October 9, 2018. https://www.michigan.gov/documents/deq/wrd-wetland-overview_558411_7.pdf.

[68] U.S. Environmental Protection Agency. "New Jersey's Clean Water Act §404 Permit Program." July 5, 2018. Accessed October 9, 2018. https://www.epa.gov/wetlands/new-jerseys-clean-water-act-ss404-permit-program.

[69] Stetson, Leah. "Expanding the States' Role in Implementing CWA § 404 Assumption." Association of State Wetland Managers. November 18, 2010. Accessed October 9, 2018. https://www.aswm.org/pdf_lib/expanding_states_role_implementing_cwa_section_404_assumption_111810.pdf.

interstate or foreign commerce and their adjacent wetlands"[70] but these determinations would have been complicated in Florida because there are so many rivers, lakes, and tidal waters.[71]

[70] U.S. Environmental Protection Agency. "State or Tribal Assumption of the Section 404 Permit Program." December 6, 2018. Accessed April 12, 2019. https://www.epa.gov/cwa-404/state-or-tribal-assumption-section-404-permit-program.

[71] Blalock, Adam F. "State Assumption of the Federal Dredge-and-Fill Permitting Program: The Search for the "Holy Grail"." Florida Bar Journal. September/October 2018. Accessed October 9, 2018. https://www.floridabar.org/the-florida-bar-journal/state-assumption-of-the-federal-dredge-and-fill-permitting-program-the-search-for-the-holy-grail/.

6 Conclusions

The study area was unlikely to be deemed jurisdictional by any version of the rule analyzed or proposed.

In order to be jurisdictional Little Sycamore Wash would have had to meet these qualifications:

1. **Pre-2015 practice:** Ephemeral streams were jurisdictional depending on a significant nexus test, which consisted of case-by-case determination of whether flow function significantly affected chemical, physical, and biological integrity of the TNW (this was current Arizona practice as of April 2019).
2. **2015 CWR:** If flow of the wash contributed flow directly or indirectly to a TNW and the wash was indicated by physical markers of bed, bank, and OHWM.
3. **2019 proposed rule:** If the wash was flowing during the wet time of year or flowing continuously during a typical year.

6.1 Start monitoring to back up connectivity determinations

Although modeled flows indicate that Little Sycamore Wash is not likely to be jurisdictional, Freeport is subject to the ongoing regulatory uncertainty concerning the physical characteristics that define connectivity. Due to the hyperlocal, field-based nature of jurisdictional determinations and the high costs associated with uncertainty and litigation, Freeport should continue to deploy resources to better understand physical hydrologic connectivity in the arid regions surrounding mining operations. Additional data is necessary to more completely understand the flow patterns of the Little Sycamore Wash and Santa Maria River. Placing four additional streamflow and precipitation gages, co-located at critical junctures in the catchment drainage network, would provide the most accurate depiction of physical hydrologic connectivity in the Santa Maria watershed. The recommended gage stations are shown in place and numbered in order of significance in Figure 5.

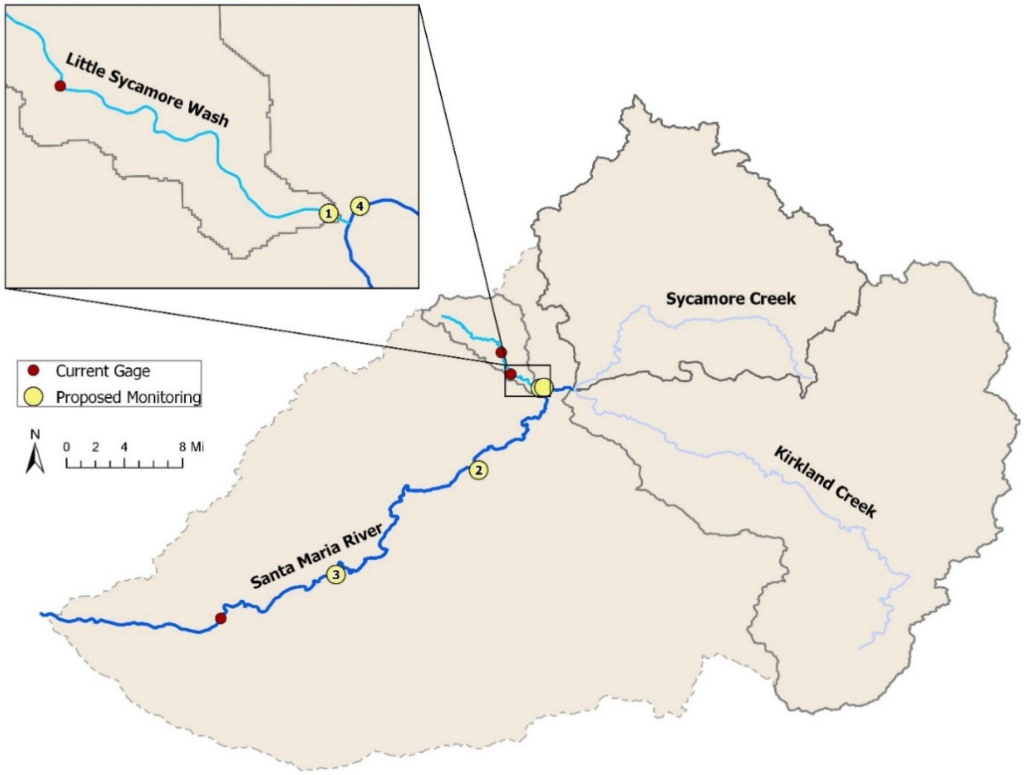

Figure 5: Location of current streamflow gages and proposed monitoring installments. The area shown is the full Santa Maria River watershed, with the major sub-basins of interest delineated. ***1*** *would be the most impactful proposed station, and* ***4*** *is recommended dependent upon financial considerations.*

The recommended monitoring stations are as follows:

1) The mouth of Little Sycamore Wash, immediately upstream of influences from the confluence with the Santa Maria River. This gage would provide a complete understanding of the contributions to flow originating in the Little Sycamore Wash catchment. It would further clarify the linear relationship to upstream reaches of the Wash and provide greater insight into the flow characteristics of the full sub-basin. A co-located precipitation gage would strengthen understanding of storm spatial distribution.

2) & **3)** Two monitoring stations roughly evenly distributed between the current Santa Maria River monitoring station and the confluence with Little Sycamore Wash. These monitoring stations would clarify flow patterns and help to identify or dispel physical hydrologic connectivity. Co-located precipitation gages would provide greater insight into the spatial distribution of storms at scale and improve future modeling efforts.

4) Downstream of the confluence of Sycamore Creek and Kirkland Creek, immediately upstream of influences of the confluence with the mouth of Little Sycamore Wash. This gage would eliminate uncertainty regarding contributions to flow from the Sycamore Creek and Kirkland Creek watersheds. If proposed gage station one has a co-located precipitation gage, an additional precipitation gage would not be necessary at this location.

This plan provides a reasonably cost-effective option to more fully understand physical hydrologic connectivity in the Little Sycamore Wash and Santa Maria River watersheds. Installing monitoring stations would furthermore provide data on a real-time, on-going basis, providing the most complete data-driven understanding of surface flow in the watershed. This is not a fully exhaustive plan, nor is it the only method to improve understanding. This monitoring plan, however, would provide valuable hydrologic connectivity data at a relatively low cost to support regulatory certainty.

6.2 Monitor the Arizona assumption process

Due to the state and federal laws requiring Arizona adopt a program that matches federal stringency, Arizona will have to watch federal policy determinations closely since they are so much in flux. The current administration has proposed a less stringent version of the regulations but that will take time to be promulgated, and there is no guarantee it will be in place before another administration takes over. If another administration takes over, it may or may not use the proposed rule or one of the previous versions to determine jurisdiction. This will cause confusion both for the state regulatory agency and for the regulated community.

Appendix A: Comparison of three definitions of jurisdictional waters

Jurisdictional Category	**Pre-2015 practice**	**2015 Clean Water Rule**	**2019 Proposed Rule**
Is it WOTUS?			
	(May include 2008 Rapanos guidance)	*Published 29 June 2015; effective 28 August 2015*	*Proposed Revised Definition 14 February 2019*
Waters that only flow in response to precipitation	Not necessarily jurisdictional, however this category is somewhat conflated with "ephemeral" waters which are not completely discounted, but subject to evaluation by the Corps for significant nexus.	*Ditches* that flow only in response to precipitation are not jurisdictional. *Tributaries* that flow only in response to precipitation in a typical year are considered ephemeral and are jurisdictional	NO
Prior converted cropland	No	No	No Agency plans to define this term
Groundwater	May be relevant for wetlands – from 2008 guidance: "A continuous surface connection does not require surface water to be continuously present between the wetland and the tributary. 33 C.F.R. § 328.3(b) and 40 C.F.R. § 232.2 (defining wetlands as "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support … a prevalence of vegetation typically adapted for life in saturated soil conditions").	No	No
Artificially irrigated areas	Unclear. However 2015 FR notice mentions this category as "on a case-by-case basis" prior to 2015.	No (not if ceasing irrigation would cause it to revert to upland)	No (not if ceasing irrigation would cause it to revert to upland)

Jurisdictional Category	Pre-2015 practice	2015 Clean Water Rule	2019 Proposed Rule
Is it WOTUS?			
Wastewater recycling/ wastewater treatment system	No	Jurisdiction specifically excludes waste treatment systems and constructed detention and retention basins created in dry land used for wastewater recycling as well as groundwater recharge basins and percolation ponds built for wastewater recycling	No Agency plans to define this term
tributaries	Yes, if tributary of otherwise defined WOTUS	Yes, including ephemeral & intermittent "waters that are characterized by the presence of physical indicators of flow—bed and banks and ordinary high water mark—and that contribute flow directly or indirectly to a traditional navigable water, an interstate water, or the territorial seas." These are jurisdictional by rule	Yes, IF they contribute perennial or intermittent flow to TNWs IF it flows through a culvert, dam, or other similar artificial break or through a debris pile, boulder field, or similar natural break so long as the artificial or natural break conveys perennial or intermittent flow to a tributary or other jurisdictional water at the downstream end of the break

Jurisdictional Category	Pre-2015 practice	2015 Clean Water Rule	2019 Proposed Rule
Is it WOTUS?			
Wetlands	Wetlands behind a berm or a dike	Wetlands behind a berm or a dike Wetlands within 100-year floodplain or within 1500 ft of OHWM	Yes, IF they are adjacent to other jurisdictional waters IF they abut or have a direct hydrologic or surface connection to a regulated water "in a typical year" (Wetlands "physically separated" from a water "by upland or by dikes, barriers, or similar structures and also lacking a direct hydrologic surface connection to such waters are not adjacent) jurisdictional. The agencies propose to adopt this position based on the rationale that an adjacent wetland is "inseparably bound up with" the water; if the water is jurisdictional, so is the adjacent wetland.
ditches	"Ditches (including roadside ditches) excavated wholly in and draining only uplands and that do not carry a relatively permanent flow of water" are generally not jurisdictional waters.	Depends – the rule explicitly excludes ditches that flow only after precipitation (or with ephemeral flow) that are *not* a relocated tributary, excavated in a tributary, or drain wetlands. "The rule continues the current policy of regulating ditches that are constructed in tributaries or are relocated tributaries or, in certain circumstances drain wetlands, or that science clearly demonstrates are functioning as a tributary."	"Certain ditches" Defined: an artificial channel used to convey water Yes: IF they are functioning as a TNW; IF they are constructed in a tributary and meet tributary definition; IF they are constructed in an adjacent wetland and meet tributary definition. No: IF they are in uplands or for purpose of conveying water

Jurisdictional Category	Pre-2015 practice	2015 Clean Water Rule	2019 Proposed Rule
Is it WOTUS?			
TNWs	Yes The Corps revised the definition in 1977 to encompass traditional navigable waters, tributaries to navigable waters, interstate waters, adjacent wetlands to those categories of waters, and "[a]ll other waters" the "degradation or destruction of which could affect interstate commerce." ("Traditional navigable waters" (or waters that are traditionally understood as navigable) refers to all waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters subject to the ebb and flow of the tide.)	Yes	Tributaries that contribute perennial or intermittent flow to such waters; certain ditches; certain lakes and ponds; impoundments of otherwise jurisdictional waters; and wetlands adjacent to other jurisdictional waters.
Interstate Waters	Yes: Included as TNWs	Yes: Included as TNWs	Yes: Included as TNWs
Territorial seas	Yes: Included as TNWs	Yes: Included as TNWs	Yes: Included as TNWs

Jurisdictional Category	Pre-2015 practice	2015 Clean Water Rule	2019 Proposed Rule
Is it WOTUS?			
Lakes/ponds	Yes, including intrastate lakes or ponds which affect interstate commerce. ("Waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, *the use, degradation or destruction of which could affect interstate or foreign commerce* including any such waters: a. Which are or could be used by interstate or foreign travelers for recreational or other purposes; or b. From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or c. Which are used or could be used for industrial purposes by industries in interstate commerce.") (Emphasis added.)	Yes if adjacent to traditional navigable waters, interstate waters, the territorial seas, impoundments, and covered tributaries... "wetlands and waters such as ponds and lakes that contribute flow to a traditional navigable water, interstate water, or the territorial seas but typically lack a bed and banks and ordinary high water mark are considered "adjacent" but not a "tributary.""	"certain lakes and ponds"
"perennial"	From EPA website archive, not dated: "Year-round streams (perennial) typically have water flowing in them year-round. Most of the water comes from smaller upstream waters or groundwater while runoff from rainfall or other precipitation is supplemental."	Perennial streams as those with flowing water year-round during a typical year, with groundwater or contributions of flow from higher in the stream or river network as primary sources of water for stream flow.	Defined: surface water flowing continuously year-round during a typical year The agencies propose to define the term "perennial" to mean surface water flowing continuously year-round during a typical year. The proposed definition of "intermittent" is surface water flowing continuously during certain times of a typical year, not merely in direct response to precipitation, but when the groundwater table is elevated, for example, or when snowpack melts.

Jurisdictional Category	Pre-2015 practice	2015 Clean Water Rule	2019 Proposed Rule
Is it WOTUS?			
“intermittent”	Depends (partly) on presence of OHWM	Yes	No Defined: surface water flowing continuously during certain times of a typical year, not merely in direct response to precipitation
“snowpack”		Yes, if it meets the definition of a tributary under the rule	
“adjacent”	"Bordering, contiguous, or neighboring” – wetlands that are adjacent to TNWs are jurisdictional	“Adjacent waters,” as defined in the rule, have a significant nexus to traditional navigable waters, interstate waters, and the territorial seas based upon their hydrological and ecological connections to, and interactions with, those waters. Under this final rule, “adjacent” means bordering, contiguous, or neighboring, including waters separated from other “waters of the United States” by constructed dikes or barriers, natural river berms, beach dunes and the like. Further, waters that connect segments of, or are at the head of, a stream or river are “adjacent” to that stream or river. “Adjacent waters” include wetlands, ponds, lakes, oxbows, impoundments, and similar water features. However, it is important to note that “adjacent waters” do not include waters that are subject to established normal farming, silviculture, and ranching activities as those terms are used in Section 404(f) of the CWA’	The term “snowpack” in this definition is proposed as “layers of snow that accumulate over extended periods of time in certain geographic regions and high altitudes (e.g., in northern climes and mountainous regions).” Melting snowpack can be the sole or primary source of perennial or intermittent flow in tributaries. The agencies recognize that perennial or intermittent flow in certain mountain streams, for example, may result primarily from melting snowpack, not groundwater contributions to the channel. Physically separated from water by upland, dike, barrier, or similar structure and also lacking direct hydrologic surface connection is not adjacent.”

Jurisdictional Category	Pre-2015 practice	2015 Clean Water Rule	2019 Proposed Rule
Is it WOTUS?			
"abut"	Not separated by uplands, a berm, dike, or similar features – important to determining continuous surface connection, though that is not necessarily required for significant nexus	Not defined	Defined: to touch at least at one point or side of a regulated water
"direct hydrologic surface connection"	"Continuous surface connection" or "shallow sub-surface connection" to jurisdictional waters can determine adjacency of a wetland	Waters with confined surface hydrologic connections are considered adjacent where they are bordering, contiguous, or neighboring a traditional navigable water, interstate water, the territorial seas, impoundment, or covered tributary. For example, a water with a confined surface hydrologic connection to a traditional navigable water that is 1,200 feet from the high tide line of that water would meet the definition of neighboring and be considered an adjacent water. In circumstances where a water does not meet the definition of neighboring but is located within the 100-year floodplain of a traditional navigable water, interstate water, or the territorial seas, or within 4,000 feet of a jurisdictional water, a confined surface hydrologic connection may be an important factor in evaluating a case-specific significant nexus under paragraph (a)(8).	Defined: "direct hydrologic surface connection" as proposed occurs as a result of inundation from a jurisdictional water to a wetland or via perennial or intermittent flow between a wetland and jurisdictional water.

Appendix B: Post-SWANCC guidance (2003)

See following page.

Appendix A

Joint Memorandum

Introduction

This document provides clarifying guidance regarding the Supreme Court's decision in *Solid Waste Agency of Northern Cook County* v. *United States Army Corps of Engineers,* 531 U.S. 159 (2001) (''SWANCC'') and addresses several legal issues concerning Clean Water Act (''CWA'') jurisdiction that have arisen since *SWANCC* in various factual scenarios involving federal regulation of ''navigable waters.'' Because the case law interpreting *SWANCC* has developed over the last two years, the Agencies are issuing this updated guidance, which supersedes prior guidance on this issue. The Corps and EPA are also initiating a rulemaking process to collect information and to consider jurisdictional issues as set forth in the attached ANPRM. Jurisdictional decisions will be based on Supreme Court cases including *United States* v. *Riverside Bayview Homes,* 474 U.S. 121 (1985) and *SWANCC,* regulations, and applicable case law in each jurisdiction.

Background

In *SWANCC,* the Supreme Court held that the Army Corps of Engineers had exceeded its authority in asserting CWA jurisdiction pursuant to section 404(a) over isolated, intrastate, non-navigable waters under 33 C.F.R. 328.3(a)(3), based on their use as habitat for migratory birds pursuant to preamble language commonly referred to as the ''Migratory Bird Rule,'' 51 FR 41217 (1986). ''Navigable waters'' are defined in section 502 of the CWA to mean ''waters of the United States, including the territorial seas.'' In *SWANCC,* the Court determined that the term ''navigable'' had significance in indicating the authority Congress intended to exercise in asserting CWA jurisdiction. 531 U.S. at 172. After reviewing the jurisdictional scope of the statutory definition of ''navigable waters'' in section 502, the Court concluded that neither the text of the statute nor its legislative history supported the

Corps' assertion of jurisdiction over the waters involved in *SWANCC. Id.* at 170–171.

In *SWANCC,* the Supreme Court recognized that ''Congress passed the CWA for the stated purpose of 'restoring and maintaining the chemical, physical, and biological integrity of the Nation's waters' '' and also noted that ''Congress chose to 'recognize, preserve, and protect the primary responsibilities and rights of States to prevent, reduce, and eliminate pollution, to plan the development and use (including restoration, preservation, and enhancement) of land and water resources.' '' *Id.* at 166–67 (citing 33 U.S.C. 1251(a) and (b)). However, expressing ''serious constitutional and federalism questions'' raised by the Corps' interpretation of the CWA, the Court stated that ''where an administrative interpretation of a statute invokes the outer limits of Congress' power, we expect a clear indication that Congress intended that result.'' *Id.* at 174, 172. Finding ''nothing approaching a clear statement from Congress that it intended section 404(a) to reach an abandoned sand and gravel pit'' (*id.* at 174), the Court held that the Migratory Bird Rule, as applied to petitioners' property, exceeded the agencies' authority under section 404(a). *Id.* at 174.

The Scope of CWA Jurisdiction After SWANCC

Because *SWANCC* limited use of 33 CFR § 328.3(a)(3) as a basis of jurisdiction over certain isolated waters, it has focused greater attention on CWA jurisdiction generally, and specifically over tributaries to jurisdictional waters and over wetlands that are ''adjacent wetlands'' for CWA purposes.

As indicated, section 502 of the CWA defines the term navigable waters to mean ''waters of the United States, including the territorial seas.'' The Supreme Court has recognized that this definition clearly includes those waters that are considered traditional navigable waters. In *SWANCC,* the Court noted that while ''the word 'navigable' in the statute was of 'limited import' '' (quoting *Riverside,* 474 U.S. 121 (1985)), ''the term 'navigable' has at least the import of showing us what Congress had in mind as its authority for enacting the CWA: traditional jurisdiction over waters that were or had been navigable in fact or which could reasonably be so made.'' 531 U.S. at 172. In addition, the Court reiterated in *SWANCC* that Congress evidenced its intent to regulate ''at least some waters that would not be deemed 'navigable' under the classical understanding of that term.'' *SWANCC* at 171 (quoting *Riverside,* 474 U.S. at 133). Relying on that intent, for many years, EPA and the Corps have interpreted their regulations to assert CWA jurisdiction over non-navigable tributaries of navigable waters and their adjacent wetlands. Courts have upheld the view that traditional navigable waters and, generally speaking, their tributary systems (and their adjacent wetlands) remain subject to CWA jurisdiction.

Several federal district and appellate courts have addressed the effect of *SWANCC* on CWA jurisdiction, and the case law on the precise scope of federal CWA jurisdiction in light of *SWANCC* is still developing. While a majority of cases hold that *SWANCC* applies only to waters that are isolated, intrastate and non-navigable, several courts have interpreted *SWANCC*'s reasoning to apply to waters other than the isolated waters at issue in that case. This memorandum attempts to add greater clarity concerning federal CWA jurisdiction following *SWANCC* by identifying specific categories of waters, explaining which categories of waters are jurisdictional or non-jurisdictional, and pointing out where more refined factual and legal analysis will be required to make a jurisdictional determination.

Although the *SWANCC* case itself specifically involved Section 404 of the CWA, the Court's decision may affect the scope of regulatory jurisdiction under other provisions of the CWA as well, including the Section 402 NPDES program, the Section 311 oil spill program, water quality standards under Section 303, and Section 401 water quality certification. Under each of these sections, the relevant agencies have jurisdiction over ''waters of the United States.'' CWA section 502(7).

This memorandum does not discuss the exact factual predicates that are necessary to establish jurisdiction in individual cases. We recognize that the field staff and the public could benefit from additional guidance on how to apply the applicable legal principles to individual cases.[1] Should questions arise concerning CWA jurisdiction, the regulated community should seek assistance from the Corps and EPA.

A. Isolated, Intrastate Waters That are Non-Navigable

SWANCC squarely eliminates CWA jurisdiction over isolated waters that are intrastate and non-navigable, where the sole basis for asserting CWA jurisdiction is the actual or potential use of the waters as habitat for migratory birds that cross state lines in their migrations. 531 U.S. at 174 (''We hold that 33 CFR § 328.3(a)(3) (1999), as clarified and applied to petitioner's balefill site pursuant to the 'Migratory Bird Rule,' 51 FR 41217 (1986), exceeds the authority granted to respondents under § 404(a) of the CWA.''). The EPA and the Corps are now precluded from asserting CWA jurisdiction in such situations, including over waters such as isolated, non-navigable, intrastate vernal pools, playa lakes and pocosins. *SWANCC* also calls into question whether CWA jurisdiction over isolated, intrastate, non-navigable waters could now be predicated on the other factors listed in the Migratory Bird Rule, 51 FR 41217 (*i.e.*, use of the water as habitat for birds protected by Migratory Bird Treaties; use of the water as habitat for Federally protected endangered or threatened species; or use of the water to irrigate crops sold in interstate commerce).

By the same token, in light of *SWANCC,* it is uncertain whether there remains any basis for jurisdiction under the other rationales of § 328.3(a)(3)(i)–(iii) over isolated, non-navigable, intrastate waters (*i.e.*, use of the water by interstate or foreign travelers for recreational or other purposes; the presence of fish or shellfish that could be taken and sold in interstate commerce; use of the water for industrial purposes by industries in interstate commerce). Furthermore, within the states comprising the Fourth Circuit, CWA jurisdiction under 33 CFR § 328.3(a)(3) in its entirety has been precluded since 1997 by the Fourth Circuit's ruling in *United States* v. *Wilson,* 133 F. 3d 251, 257 (4th Cir. 1997) (invalidating 33 CFR § 328.3(a)(3)).

In view of *SWANCC,* neither agency will assert CWA jurisdiction over isolated waters that are both intrastate and non-navigable, where the sole basis available for asserting CWA jurisdiction rests on any of the factors listed in the ''Migratory Bird Rule.'' In addition, in view of the uncertainties after *SWANCC* concerning jurisdiction over isolated waters that are both intrastate and non-navigable based on other grounds listed in 33 CFR § 328.3(a)(3)(i)–(iii), field staff should seek formal project-specific Headquarters approval prior to asserting jurisdiction over such waters, including permitting and enforcement actions.

B. Traditional Navigable Waters

As noted, traditional navigable waters are jurisdictional. Traditional navigable waters are waters that are subject to the ebb and flow of the tide, or waters that are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. 33 CFR § 328.3(a)(1); *United States* v. *Appalachian Elec. Power Co.,* 311 U.S. 377, 407–408 (1940) (water considered navigable, although not navigable at present but could be made navigable with reasonable improvements); *Economy Light & Power Co.* v. *United States,* 256 U.S. 113 (1911) (dams and other structures do not eliminate navigability); *SWANCC,* 531 U.S. at 172 (referring to traditional jurisdiction over waters that were or had been navigable in fact or which could reasonably be so made).[2]

In accord with the analysis in *SWANCC,* waters that fall within the definition of traditional navigable waters remain jurisdictional under the CWA. Thus, isolated, intrastate waters that are capable of supporting navigation by watercraft remain subject to CWA jurisdiction after SWANCC if they are traditional navigable waters, *i.e.*, if they meet any of the tests for being navigable-in-fact. *See, e.g., Colvin* v. *United States* 181 F. Supp. 2d 1050 (C.D. Cal. 2001) (isolated

[1] The CWA provisions and regulations described in this document contain legally binding requirements. This document does not substitute for those provisions or regulations, nor is it a regulation itself. It does not impose legally binding requirements on EPA, the Corps, or the regulated community, and may not apply to a particular situation depending on the circumstances. Any decisions regarding a particular water will be based on the applicable statutes, regulations, and case law. Therefore, interested person are free to raise questions and objections about the appropriateness of the application of this guidance to a particular situation, and EPA and/or the Corps will consider whether or not the recommendations or interpretations of this guidance are appropriate in that situation based on the law and regulations.

[2] These traditional navigable waters are not limited to those regulated under Section 10 of the Rivers and Harbors Act of 1899; traditional navigable waters include waters which, although used, susceptibale to use, or historically used, to transport goods or people in commerce, do not form part of a continuous wateborne highway.

man-made water body capable of boating found to be ''water of the United States'').

C. Adjacent Wetlands

(1) Wetlands Adjacent to Traditional Navigable Waters

CWA jurisdiction also extends to wetlands that are adjacent to traditional navigable waters. The Supreme Court did not disturb its earlier holding in *Riverside* when it rendered its decision in *SWANCC. Riverside* dealt with a wetland adjacent to Black Creek, a traditional navigable water. 474 U.S. 121 (1985); *see also SWANCC,* 531 U.S. at 167 (''[i]n *Riverside,* we held that the Corps had section 404(a) jurisdiction over wetlands that actually abutted on a navigable waterway''). The Court in *Riverside* found that ''Congress'; concern for the protection of water quality and aquatic ecosystems indicated its intent to regulate wetlands 'inseparably bound up with' '' jurisdictional waters. 474 U.S. at 134. Thus, wetlands adjacent to traditional navigable waters clearly remain jurisdictional after *SWANCC.* The Corps and EPA currently define 'adjacent' as ''bordering, contiguous, or neighboring. Wetlands separated from other waters of the United States by man-made dikes or barriers, natural river berms, beach dunes, and the like are 'adjacent wetlands.' '' 33 CFR § 328.3(b); 40 CFR § 230.3(b). The Supreme Court has not itself defined the term ''adjacent,'' nor stated whether the basis for adjacency is geographic proximity or hydrology.

(2) Wetlands Adjacent to Non-Navigable Waters

The reasoning in Riverside, as followed by a number of post-SWANCC courts, supports jurisdiction over wetlands adjacent to non-navigable waters that are tributaries to navigable waters. Since SWANCC, some courts have expressed the view that SWANCC raised questions about adjacency jurisdiction, so that wetlands are jurisdictional only if they are adjacent to navigable waters. *See, e.g., Rice* v. *Harken,* discussed *infra*.

D. Tributaries

A number of court decisions have held that *SWANCC* does not change the principle that CWA jurisdiction extends to tributaries of navigable waters. *See, e.g., Headwaters* v. *Talent Irrigation Dist.,* 243 F.3d 526, 534 (9th Cir. 2001) (''Even tributaries that flow intermittently are 'waters of the United States' ''); *United States* v. *Interstate Gen. Co,* No. 01–4513, slip op. at 7, 2002 WL 1421411 (4th Cir. July 2, 2002), *aff'ing* 152 F. Supp. 2d 843 (D. Md. 2001) (refusing to grant writ of coram nobis; rejecting argument that *SWANCC* eliminated jurisdiction over wetlands adjacent to non-navigable tributaries); *United States* v. *Krilich,* 393F.3d 784 (7th Cir. 2002) (rejecting motion to vacate consent decree, finding that *SWANCC* did not alter regulations interpreting ''waters of the U.S.'' other than 33 C.F.R. § 328.3(a)(3)); *Community Ass. for Restoration of the Env't* v. *Henry Bosma Dairy,* 305 F.3d 953 (9th Cir. 2002) (drain that flowed into a canal that flows into a river is jurisdictional); *Idaho Rural Council* v. *Bosma,* 143 F. Supp. 2d 1169, 1178 (D. Idaho 2001) (''waters of the United States include waters that are tributary to navigable waters''); *Aiello* v. *Town of Brookhaven,* 136 F. Supp. 2d 81, 118 (E.D. N.Y. 2001) (non-navigable pond and creek determined to be tributaries of navigable waters, and therefore ''waters of the United States under the CWA''). Jurisdiction has been recognized even when the tributaries in question flow for a significant distance before reaching a navigable water or are several times removed from the navigable waters (*i.e.*, ''tributaries of tributaries''). *See, e.g., United States* v. *Lamplight Equestrian Ctr.,* No. 00 C 6486, 2002 WL 360652, at *8 (ND. Ill. Mar. 8, 2002) (''Even where the distance from the tributary to the navigable water is significant, the quality of the tributary is still vital to the quality of navigable waters''); *United States* v. *Buday,* 138 F. Supp. 2d 1282, 1291–92 (D. Mont. 2001) (''water quality of tributaries * * * distant though the tributaries may be from navigable streams, is vital to the quality of navigable waters''); *United States* v. *Rueth Dev. Co.,* No. 2:96CV540, 2001 WL 17580078 (N.D. Ind. Sept. 26, 2001) (refusing to reopen a consent decree in a CWA case and determining that jurisdiction remained over wetlands adjacent to a non-navigable (man-made) waterway that flows into a navigable water).

Some courts have interpreted the reasoning in *SWANCC* to potentially circumscribe CWA jurisdiction over tributaries by finding CWA jurisdiction attaches only where navigable waters and waters immediately adjacent to navigable waters are involved. *Rice* v. *Harken* is the leading case taking the narrowest view of CWA jurisdiction after *SWANCC.* 250 F.3d 264 (5th Cir. 2001) (rehearing denied). *Harken* interpreted the scope of ''navigable waters'' under the Oil Pollution Act (OPA). The Fifth Circuit relied on *SWANCC* to conclude ''it appears that a body of water is subject to regulation under the CWA if the body of water is actually navigable or is adjacent to an open body of navigable water.'' 250 F.3d at 269. The analysis in *Harken* implies that the Fifth Circuit might limit CWA jurisdiction to only those tributaries that are traditionally navigable or immediately adjacent to a navigable water.

A few post-*SWANCC* district court opinions have relied on *Harken* or reasoning similar to that employed by the Harken court to limit jurisdiction. *See, e.g., United States* v. *Rapanos,* 190 F. Supp. 2d 1011(E.D. Mich. 2002) (government appeal pending) (''the Court finds as a matter of law that the wetlands on Defendant's property were not directly adjacent to navigable waters, and therefore, the government cannot regulate Defendant's property.''); *United States* v. *Needham,* No. 6:01–CV–01897, 2002 WL 1162790 (W.D. La. Jan. 23, 2002) (government appeal pending) (district court affirmed finding of no liability by bankruptcy court for debtors under OPA for discharge of oil since drainage ditch into which oil was discharged was found to be neither a navigable water nor adjacent to an open body of navigable water). *See alsoUnited States* v. *Newdunn,* 195 F. Supp. 2d 751 (E.D. Va. 2002) (government appeal pending) (wetlands and tributaries not contiguous or adjacent to navigable waters are outside CWA jurisdiction); *United States* v. *RGM Corp.,* 222 F. Supp. 2d 780 (E.D. Va. 2002) (government appeal pending) (wetlands on property not contiguous to navigable river and, thus, jurisdiction not established based upon adjacency to navigable water).

Another question that has arisen is whether CWA jurisdiction is affected when a surface tributary to jurisdictional waters flows for some of its length through ditches, culverts, pipes, storm sewers, or similar manmade conveyances. A number of courts have held that waters with manmade features are jurisdictional. For example, in *Headwaters Inc.* v. *Talent Irrigation District,* the Ninth Circuit held that manmade irrigation canals that diverted water from one set of natural streams and lakes to other streams and creeks were connected as tributaries to waters of the United States, and consequently fell within the purview of CWA jurisdiction. 243 F.3d at 533–34. However, some courts have taken a different view of the circumstances under which man-made conveyances satisfy the requirements for CWA jurisdiction. *See, e.g., Newdunn,* 195 F. Supp. 2d at 765 (government appeal pending) (court determined that Corps had failed to carry its burden of establishing CWA jurisdiction over wetlands from which surface water had to pass through a spur ditch, a series of man-made ditches and culverts as well as non-navigable portions of a creek before finally reaching navigable waters).

A number of courts have held that waters connected to traditional navigable waters only intermittently or ephemerally are subject to CWA jurisdiction. The language and reasoning in the Ninth Circuit's decision in *Headwaters Inc.* v. *Talent Irrigation District* indicates that the intermittent flow of waters does not affect CWA jurisdiction. 243 F.3d at 534 (''Even tributaries that flow intermittently are 'waters of the United States.' ''). Other cases, however, have suggested that *SWANCC* eliminated from CWA jurisdiction some waters that flow only intermittently. *See, e.g., Newdunn,* 195 F. Supp. 2d at 764, 767–68 (government appeal pending) (ditches and culverts with intermittent flow not jurisdictional).

A factor in determining jurisdiction over waters with intermittent flows is the presence or absence of an ordinary high water mark (OHWM). Corps regulations provide that, in the absence of adjacent wetlands, the lateral limits of non-tidal waters extend to the OHWM (33 CFR 328.4(c)(1)). One court has interpreted this regulation to require the presence of a continuous OHWM. *United States* v. *RGM,* 222 F. Supp. 2d 780 (E.D. Va. 2002) (government appeal pending).

Conclusion

In light of *SWANCC,* field staff should not assert CWA jurisdiction over isolated waters that are both intrastate and non-navigable, where the sole basis available for asserting CWA jurisdiction rests on any of the factors listed in the ''Migratory Bird Rule.'' In addition, field staff should seek formal project-specific HQ approval prior to asserting jurisdiction over waters based on other factors listed in 33 CFR 328.3(a)(3)(i)–(iii).

Field staff should continue to assert jurisdiction over traditional navigable waters (and adjacent wetlands) and, generally speaking, their tributary systems (and adjacent wetlands). Field staff should make jurisdictional and permitting decisions on a case-by-case basis considering this guidance, applicable regulations, and any additional relevant court decisions. Where questions remain, the regulated community should seek assistance from the agencies on questions of jurisdiction.

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[FR Doc. 03–960 Filed 1–14–03; 8:45 am]

BILLING CODE 6560–50–P

Appendix C: Post-Rapanos guidance (2008)

See following page.

Clean Water Act Jurisdiction
Following the U.S. Supreme Court's Decision
in
Rapanos v. United States & Carabell v. United States

This memorandum[1] provides guidance to EPA regions and U.S. Army Corps of Engineers ["Corps"] districts implementing the Supreme Court's decision in the consolidated cases Rapanos v. United States and Carabell v. United States[2] (herein referred to simply as "Rapanos") which address the jurisdiction over waters of the United States under the Clean Water Act.[3] The chart below summarizes the key points contained in this memorandum. This reference tool is not a substitute for the more complete discussion of issues and guidance furnished throughout the memorandum.

Summary of Key Points

The agencies will assert jurisdiction over the following waters:

- **Traditional navigable waters**
- **Wetlands adjacent to traditional navigable waters**
- **Non-navigable tributaries of traditional navigable waters that are relatively permanent where the tributaries typically flow year-round or have continuous flow at least seasonally (e.g., typically three months)**
- **Wetlands that directly abut such tributaries**

The agencies will decide jurisdiction over the following waters based on a fact-specific analysis to determine whether they have a significant nexus with a traditional navigable water:

- **Non-navigable tributaries that are not relatively permanent**
- **Wetlands adjacent to non-navigable tributaries that are not relatively permanent**
- **Wetlands adjacent to but that do not directly abut a relatively permanent non-navigable tributary**

The agencies generally will not assert jurisdiction over the following features:

- **Swales or erosional features (e.g., gullies, small washes characterized by low volume, infrequent, or short duration flow)**
- **Ditches (including roadside ditches) excavated wholly in and draining only uplands and that do not carry a relatively permanent flow of water**

The agencies will apply the significant nexus standard as follows:

- **A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by all wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical and biological integrity of downstream traditional navigable waters**
- **Significant nexus includes consideration of hydrologic and ecologic factors**

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[1] This guidance incorporates revisions to the EPA/Army Memorandum originally issued on June 6, 2007, after careful consideration of public comments received and based on the agencies' experience in implementing the *Rapanos* decision.
[2] 126 S. Ct. 2208 (2006).
[3] 33 U.S.C. §1251 et seq.

Background

Congress enacted the Clean Water Act ("CWA" or "the Act") "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters."[4] One of the mechanisms adopted by Congress to achieve that purpose is a prohibition on the discharge of any pollutants, including dredged or fill material, into "navigable waters" except in compliance with other specified sections of the Act.[5] In most cases, this means compliance with a permit issued pursuant to CWA §402 or §404. The Act defines the term "discharge of a pollutant" as "any addition of any pollutant to navigable waters from any point source[,]"[6] and provides that "[t]he term 'navigable waters' means the waters of the United States, including the territorial seas[,]." [7]

In Rapanos, the Supreme Court addressed where the Federal government can apply the Clean Water Act, specifically by determining whether a wetland or tributary is a "water of the United States." The justices issued five separate opinions in Rapanos (one plurality opinion, two concurring opinions, and two dissenting opinions), with no single opinion commanding a majority of the Court.

The Rapanos Decision

Four justices, in a plurality opinion authored by Justice Scalia, rejected the argument that the term "waters of the United States" is limited to only those waters that are navigable in the traditional sense and their abutting wetlands.[8] However, the plurality concluded that the agencies' regulatory authority should extend only to "relatively permanent, standing or continuously flowing bodies of water" connected to traditional navigable waters, and to "wetlands with a continuous surface connection to" such relatively permanent waters.[9]

Justice Kennedy did not join the plurality's opinion but instead authored an opinion concurring in the judgment vacating and remanding the cases to the Sixth Circuit Court of Appeals.[10] Justice Kennedy agreed with the plurality that the statutory term "waters of the United States" extends beyond water bodies that are traditionally considered navigable.[11] Justice Kennedy, however, found the plurality's interpretation of the scope of the CWA to be "inconsistent with the Act's text, structure, and purpose[,]" and he instead presented a different standard for evaluating CWA jurisdiction over wetlands and other water bodies.[12] Justice Kennedy concluded that wetlands are "waters

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4 33 U.S.C. § 1251(a).
5 33 U.S.C. § 1311(a), §1362(12)(A).
6 33 U.S.C. § 1362(12)(A)
7 33 U.S.C. § 1362(7). See also 33 C.F.R. § 328.3(a) and 40 C.F.R. § 230.3(s).
8 Id. at 2220.
9 Id. at 2225-27.
10 Id. at 2236-52. While Justice Kennedy concurred in the Court's decision to vacate and remand the cases to the Sixth Circuit, his basis for remand was limited to the question of "whether the specific wetlands at issue possess a significant nexus with navigable waters." 126 S. Ct. at 2252. In contrast, the plurality remanded the cases to determine both "whether the ditches and drains near each wetland are 'waters,'" and "whether the wetlands in question are 'adjacent' to these 'waters' in the sense of possessing a continuous surface connection…." Id. at 2235.
11 Id. at 2241.
12 Id. at 2246.

of the United States" "if the wetlands, either alone or in combination with similarly situated lands in the region, significantly affect the chemical, physical, and biological integrity of other covered waters more readily understood as 'navigable.' When, in contrast, wetlands' effects on water quality are speculative or insubstantial, they fall outside the zone fairly encompassed by the statutory term 'navigable waters.'"[13]

Four justices, in a dissenting opinion authored by Justice Stevens, concluded that EPA's and the Corps' interpretation of "waters of the United States" was a reasonable interpretation of the Clean Water Act.[14]

When there is no majority opinion in a Supreme Court case, controlling legal principles may be derived from those principles espoused by five or more justices.[15] Thus, regulatory jurisdiction under the CWA exists over a water body if either the plurality's or Justice Kennedy's standard is satisfied.[16] Since Rapanos, the United States has filed pleadings in a number of cases interpreting the decision in this manner.

The agencies are issuing this memorandum in recognition of the fact that EPA regions and Corps districts need guidance to ensure that jurisdictional determinations, permitting actions, and other relevant actions are consistent with the decision and supported by the administrative record. Therefore, the agencies have evaluated the Rapanos opinions to identify those waters that are subject to CWA jurisdiction under the reasoning of a majority of the justices. This approach is appropriate for a guidance document. The agencies will continue to monitor implementation of the Rapanos decision in the field and recognize that further consideration of jurisdictional issues, including clarification and definition of key terminology, may be appropriate in the future, either through issuance of additional guidance or through rulemaking.

[13] Id. at 2248. Chief Justice Roberts wrote a separate concurring opinion explaining his agreement with the plurality. See 126 S. Ct. at 2235-36.

[14] Id. at 2252-65. Justice Breyer wrote a separate dissenting opinion explaining his agreement with Justice Stevens' dissent. See 126 S. Ct. at 2266.

[15] See Marks v. United States, 430 U.S. 188, 193-94 (1977); Waters v. Churchill, 511 U.S. 661, 685 (1994) (Souter, J., concurring) (analyzing the points of agreement between plurality, concurring, and dissenting opinions to identify the legal "test ... that lower courts should apply," under Marks, as the holding of the Court); cf. League of United Latin American Citizens v. Perry, 126 S. Ct. 2594, 2607 (2006) (analyzing concurring and dissenting opinions in a prior case to identify a legal conclusion of a majority of the Court); Alexander v. Sandoval, 532 U.S. 275, 281-282 (2001) (same).

[16] 126 S. Ct. at 2265 (Stevens, J., dissenting) ("Given that all four justices who have joined this opinion would uphold the Corps' jurisdiction in both of these cases – and in all other cases in which either the plurality's or Justice Kennedy's test is satisfied – on remand each of the judgments should be reinstated *if either* of those tests is met.") (emphasis in original). The agencies recognize that the Eleventh Circuit, in United States v. McWane, Inc., et al., 505 F.3d 1208 (11th Cir. 2007), has concluded that the Kennedy standard is the sole method of determining CWA jurisdiction in that Circuit. The Supreme Court denied the government's petition for a writ of *certiorari* on December 1, 2008.

Agency Guidance[17]

To ensure that jurisdictional determinations, administrative enforcement actions, and other relevant agency actions are consistent with the Rapanos decision, the agencies in this guidance address which waters are subject to CWA § 404 jurisdiction.[18] Specifically, this guidance identifies those waters over which the agencies will assert jurisdiction categorically and on a case-by-case basis, based on the reasoning of the Rapanos opinions.[19] EPA and the Corps will continually assess and review the application of this guidance to ensure nationwide consistency, reliability, and predictability in our administration of the statute.

1. Traditional Navigable Waters (i.e., "(a)(1) Waters") and Their Adjacent Wetlands

Key Points

- **The agencies will assert jurisdiction over traditional navigable waters, which includes all the waters described in 33 C.F.R. § 328.3(a)(1), and 40 C.F.R. § 230.3 (s)(1).**
- **The agencies will assert jurisdiction over wetlands adjacent to traditional navigable waters, including over adjacent wetlands that do not have a continuous surface connection to traditional navigable waters.**

EPA and the Corps will continue to assert jurisdiction over "[a]ll waters which are currently used, or were used in the past, or may be susceptible to use in interstate or

[17] The CWA provisions and regulations described in this document contain legally binding requirements. This guidance does not substitute for those provisions or regulations, nor is it a regulation itself. It does not impose legally binding requirements on EPA, the Corps, or the regulated community, and may not apply to a particular situation depending on the circumstances. Any decisions regarding a particular water will be based on the applicable statutes, regulations, and case law. Therefore, interested persons are free to raise questions about the appropriateness of the application of this guidance to a particular situation, and EPA and/or the Corps will consider whether or not the recommendations or interpretations of this guidance are appropriate in that situation based on the statutes, regulations, and case law.

[18] This guidance focuses only on those provisions of the agencies' regulations at issue in Rapanos -- 33 C.F.R. §§ 328.3(a)(1), (a)(5), and (a)(7); 40 C.F.R. §§ 230.3(s)(1), (s)(5), and (s)(7). This guidance does not address or affect other subparts of the agencies' regulations, or response authorities, relevant to the scope of jurisdiction under the CWA. In addition, because this guidance is issued by both the Corps and EPA, which jointly administer CWA § 404, it does not discuss other provisions of the CWA, including §§ 311 and 402, that differ in certain respects from § 404 but share the definition of "waters of the United States." Indeed, the plurality opinion in Rapanos noted that "... there is no reason to suppose that our construction today significantly affects the enforcement of §1342 ... The Act does not forbid the 'addition of any pollutant *directly* to navigable waters from any point source,' but rather the 'addition of any pollutant *to* navigable waters.'" (emphasis in original) 126 S. Ct. 2208, 2227. EPA is considering whether to provide additional guidance on these and other provisions of the CWA that may be affected by the Rapanos decision.

[19] In 2001, the Supreme Court held that use of "isolated" non-navigable intrastate waters by migratory birds was not by itself a sufficient basis for the exercise of federal regulatory jurisdiction under the CWA. See Solid Waste Agency of Northern Cook County (SWANCC) v. U.S. Army Corps of Engineers, 531 U.S. 159 (2001). This guidance does not address SWANCC, nor does it affect the Joint Memorandum regarding that decision issued by the General Counsels of EPA and the Department of the Army on January 10, 2003. See 68 Fed. Reg. 1991, 1995 (Jan. 15, 2003).

foreign commerce, including all waters which are subject to the ebb and flow of the tide."[20] These waters are referred to in this guidance as traditional navigable waters.

The agencies will also continue to assert jurisdiction over wetlands "adjacent" to traditional navigable waters as defined in the agencies' regulations. Under EPA and Corps regulations and as used in this guidance, "adjacent" means "bordering, contiguous, or neighboring." Finding a continuous surface connection is not required to establish adjacency under this definition. The Rapanos decision does not affect the scope of jurisdiction over wetlands that are adjacent to traditional navigable waters because at least five justices agreed that such wetlands are "waters of the United States."[21]

The regulations define "adjacent" as follows: "The term *adjacent* means bordering, contiguous, or neighboring. Wetlands separated from other waters of the United States by man-made dikes or barriers, natural river berms, beach dunes and the like are 'adjacent wetlands.'"[22] Under this definition, the agencies consider wetlands adjacent if one of following three criteria is satisfied. First, there is an unbroken surface or shallow sub-surface connection to jurisdictional waters. This hydrologic connection may be intermittent. Second, they are physically separated from jurisdictional waters by man-made dikes or barriers, natural river berms, beach dunes, and the like. Or third, their proximity to a jurisdictional water is reasonably close, supporting the science-based

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[20] 33 C.F.R. § 328.3(a)(1); 40 C.F.R. § 230.3(s)(1). The "(a)(1)" waters include all of the "navigable waters of the United States," defined in 33 C.F.R. Part 329 and by numerous decisions of the federal courts, plus all other waters that are navigable-in-fact (e.g., the Great Salt Lake, UT and Lake Minnetonka MN). For purposes of CWA jurisdiction and this guidance, waters will be considered traditional navigable waters if:

- They are subject to Section 9 or 10 of the Rivers and Harbors Act, or
- A federal court has determined that the water body is navigable-in-fact under federal law, or
- They are waters currently being used for commercial navigation, including commercial water-borne recreation (e.g., boat rentals, guided fishing trips, water ski tournaments, etc.), or
- They have historically been used for commercial navigation, including commercial water-borne recreation; or
- They are susceptible to being used in the future for commercial navigation, including commercial water-borne recreation. Susceptibility for future use may be determined by examining a number of factors, including the physical characteristics and capacity of the water (e.g., size, depth, and flow velocity, etc.) to be used in commercial navigation, including commercial recreational navigation, and the likelihood of future commercial navigation or commercial water-borne recreation. Evidence of future commercial navigation use, including commercial water-borne recreation (e.g., development plans, plans for water dependent events, etc.), must be clearly documented. Susceptibility to future commercial navigation, including commercial water-borne recreation, will not be supported when the evidence is insubstantial or speculative. Use of average flow statistics may not accurately represent streams with "flashy" flow characteristics. In such circumstances, daily gage data is more representative of flow characteristics.

[21] Id. at 2248 (Justice Kennedy, concurring) ("As applied to wetlands adjacent to navigable-in-fact waters, the Corps' conclusive standard for jurisdiction rests upon a reasonable inference of ecologic interconnection, and the assertion of jurisdiction for those wetlands is sustainable under the Act by showing adjacency alone.").

[22] 33 C.F.R. § 328.3(c).

inference that such wetlands have an ecological interconnection with jurisdictional waters.[23] Because of the scientific basis for this inference, determining whether a wetland is reasonably close to a jurisdictional water does not generally require a case-specific demonstration of an ecologic interconnection. In the case of a jurisdictional water and a reasonably close wetland, such implied ecological interconnectivity is neither speculative nor insubstantial. For example, species, such as amphibians or anadramous and catadramous fish, move between such waters for spawning and their life stage requirements. Migratory species, however, shall not be used to support an ecologic interconnection. In assessing whether a wetland is reasonably close to a jurisdictional water, the proximity of the wetland (including all parts of a single wetland that has been divided by road crossings, ditches, berms, etc.) in question will be evaluated and shall not be evaluated together with other wetlands in the area.

2. Relatively Permanent Non-navigable Tributaries of Traditional Navigable Waters and Wetlands with a Continuous Surface Connection with Such Tributaries

Key Points

- **The agencies will assert jurisdiction over non-navigable tributaries of traditional navigable waters that are relatively permanent where the tributaries typically flow year-round or have continuous flow at least seasonally (e.g., typically three months).**
- **The agencies will assert jurisdiction over those adjacent wetlands that have a continuous surface connection to such tributaries (e.g., they are not separated by uplands, a berm, dike, or similar feature.)**

A non-navigable tributary[24] of a traditional navigable water is a non-navigable water body whose waters flow into a traditional navigable water either directly or indirectly by means of other tributaries. Both the plurality opinion and the dissent would uphold CWA jurisdiction over non-navigable tributaries that are "relatively permanent" – waters that typically (e.g., except due to drought) flow year-round or waters that have a

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[23] See e.g., United States v. Riverside Bayview Homes, Inc., 474 U.S. 121, 134 (1985) ("...the Corps' ecological judgment about the relationship between waters and their adjacent wetlands provides an adequate basis for a legal judgment that adjacent wetlands may be defined as waters under the Act.").

[24] A tributary includes natural, man-altered, or man-made water bodies that carry flow directly or indirectly into a traditional navigable water. Furthermore, a tributary, for the purposes of this guidance, is the entire reach of the stream that is of the same order (i.e., from the point of confluence, where two lower order streams meet to form the tributary, downstream to the point such tributary enters a higher order stream). The flow characteristics of a particular tributary generally will be evaluated at the farthest downstream limit of such tributary (i.e., the point the tributary enters a higher order stream). However, for purposes of determining whether the tributary is relatively permanent, where data indicates the flow regime at the downstream limit is not representative of the entire tributary (as described above) (e.g., where data indicates the tributary is relatively permanent at its downstream limit but not for the majority of its length, or vice versa), the flow regime that best characterizes the entire tributary should be used. A primary factor in making this determination is the relative lengths of segments with differing flow regimes. It is reasonable for the agencies to treat the entire tributary in light of the Supreme Court's observation that the phrase "navigable waters" generally refers to "rivers, streams, and other hydrographic features." 126 S. Ct. at 2222 (Justice Scalia, quoting Riverside Bayview, 474 U.S. at 131). The entire reach of a stream is a reasonably identifiable hydrographic feature. The agencies will also use this characterization of tributary when applying the significant nexus standard under Section 3 of this guidance.

continuous flow at least seasonally (e.g., typically three months).[25] Justice Scalia emphasizes that relatively permanent waters do not include tributaries "whose flow is 'coming and going at intervals ... broken, fitful.'"[26] Therefore, "relatively permanent" waters do not include ephemeral tributaries which flow only in response to precipitation and intermittent streams which do not typically flow year-round or have continuous flow at least seasonally. However, CWA jurisdiction over these waters will be evaluated under the significant nexus standard described below. The agencies will assert jurisdiction over relatively permanent non-navigable tributaries of traditional navigable waters without a legal obligation to make a significant nexus finding.

In addition, the agencies will assert jurisdiction over those adjacent wetlands that have a continuous surface connection with a relatively permanent, non-navigable tributary, without the legal obligation to make a significant nexus finding. As explained above, the plurality opinion and the dissent agree that such wetlands are jurisdictional.[27] The plurality opinion indicates that "continuous surface connection" is a "physical connection requirement."[28] Therefore, a continuous surface connection exists between a wetland and a relatively permanent tributary where the wetland directly abuts the tributary (e.g., they are not separated by uplands, a berm, dike, or similar feature).[29]

[25] See 126 S. Ct. at 2221 n. 5 (Justice Scalia, plurality opinion) (explaining that "relatively permanent" does not necessarily exclude waters "that might dry up in extraordinary circumstances such as drought" or "seasonal rivers, which contain continuous flow during some months of the year but no flow during dry months").

[26] Id. (internal citations omitted)

[27] Id. at 2226-27 (Justice Scalia, plurality opinion).

[28] Id. at 2232 n.13 (referring to "our physical-connection requirement" and later stating that Riverside Bayview does not reject "the physical-connection requirement") and 2234 ("Wetlands are 'waters of the United States' if they bear the 'significant nexus' of physical connection, which makes them as a practical matter *indistinguishable* from waters of the United States.") (emphasis in original). See also 126 S. Ct. at 2230 ("adjacent" means "physically abutting") and 2229 (citing to Riverside Bayview as "confirm[ing] that the scope of ambiguity of 'the waters of the United States' is determined by a wetland's *physical connection* to covered waters...") (emphasis in original). A continuous surface connection does not require surface water to be continuously present between the wetland and the tributary. 33 C.F.R. § 328.3(b) and 40 C.F.R. § 232.2 (defining wetlands as "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support ... a prevalence of vegetation typically adapted for life in saturated soil conditions").

[29] While all wetlands that meet the agencies' definitions are considered adjacent wetlands, only those adjacent wetlands that have a continuous surface connection because they directly abut the tributary (e.g., they are not separated by uplands, a berm, dike, or similar feature) are considered jurisdictional under the plurality standard.

3. Certain Adjacent Wetlands and Non-navigable Tributaries That Are Not Relatively Permanent

Key Points

- **The agencies will assert jurisdiction over non-navigable, not relatively permanent tributaries and their adjacent wetlands where such tributaries and wetlands have a significant nexus to a traditional navigable water.**
- **A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical and biological integrity of downstream traditional navigable waters.**
- **"Similarly situated" wetlands include all wetlands adjacent to the same tributary.**
- **Significant nexus includes consideration of hydrologic factors including the following:**
  - **volume, duration, and frequency of flow, including consideration of certain physical characteristics of the tributary**
  - **proximity to the traditional navigable water**
  - **size of the watershed**
  - **average annual rainfall**
  - **average annual winter snow pack**
- **Significant nexus also includes consideration of ecologic factors including the following:**
  - **potential of tributaries to carry pollutants and flood waters to traditional navigable waters**
  - **provision of aquatic habitat that supports a traditional navigable water**
  - **potential of wetlands to trap and filter pollutants or store flood waters**
  - **maintenance of water quality in traditional navigable waters**
- **The following geographic features generally are not jurisdictional waters:**
  - **swales or erosional features (e.g. gullies, small washes characterized by low volume, infrequent, or short duration flow)**
  - **ditches (including roadside ditches) excavated wholly in and draining only uplands and that do not carry a relatively permanent flow of water**

The agencies will assert jurisdiction over the following types of waters when they have a significant nexus with a traditional navigable water: (1) non-navigable tributaries that are not relatively permanent,[30] (2) wetlands adjacent to non-navigable tributaries that are not relatively permanent, and (3) wetlands adjacent to, but not directly abutting, a relatively permanent tributary (e.g., separated from it by uplands, a berm, dike or similar feature).[31] As described below, the agencies will assess the flow characteristics and functions of the tributary itself, together with the functions performed by any wetlands adjacent to that tributary, to determine whether collectively they have a significant nexus with traditional navigable waters.

[30] For simplicity, the term "tributary" when used alone in this section refers to non-navigable tributaries that are not relatively permanent.

[31] As described in Section 2 of this guidance, the agencies will assert jurisdiction, without the need for a significant nexus finding, over all wetlands that are both adjacent and have a continuous surface connection to relatively permanent tributaries. See pp. 6-7, supra.

The agencies' assertion of jurisdiction over non-navigable tributaries and adjacent wetlands that have a significant nexus to traditional navigable waters is supported by five justices. Justice Kennedy applied the significant nexus standard to the wetlands at issue in Rapanos and Carabell: "[W]etlands possess the requisite nexus, and thus come within the statutory phrase 'navigable waters,' if the wetlands, either alone or in combination with similarly situated lands in the region, significantly affect the chemical, physical, and biological integrity of other covered waters more readily understood as 'navigable.'"[32] While Justice Kennedy's opinion discusses the significant nexus standard primarily in the context of wetlands adjacent to non-navigable tributaries,[33] his opinion also addresses Clean Water Act jurisdiction over tributaries themselves. Justice Kennedy states that, based on the Supreme Court's decisions in Riverside Bayview and SWANCC, "the connection between a non-navigable water or wetland may be so close, or potentially so close, that the Corps may deem the water or wetland a 'navigable water' under the Act. ... Absent a significant nexus, jurisdiction under the Act is lacking."[34] Thus, Justice Kennedy would limit jurisdiction to those waters that have a significant nexus with traditional navigable waters, although his opinion focuses on the specific factors and functions the agencies should consider in evaluating significant nexus for adjacent wetlands, rather than for tributaries.

In considering how to apply the significant nexus standard, the agencies have focused on the integral relationship between the ecological characteristics of tributaries and those of their adjacent wetlands, which determines in part their contribution to restoring and maintaining the chemical, physical and biological integrity of the Nation's traditional navigable waters. The ecological relationship between tributaries and their adjacent wetlands is well documented in the scientific literature and reflects their physical proximity as well as shared hydrological and biological characteristics. The flow parameters and ecological functions that Justice Kennedy describes as most relevant to an evaluation of significant nexus result from the ecological inter-relationship between tributaries and their adjacent wetlands. For example, the duration, frequency, and volume of flow in a tributary, and subsequently the flow in downstream navigable waters, is directly affected by the presence of adjacent wetlands that hold floodwaters, intercept sheet flow from uplands, and then release waters to tributaries in a more even and constant manner. Wetlands may also help to maintain more consistent water temperature in tributaries, which is important for some aquatic species. Adjacent wetlands trap and hold pollutants that may otherwise reach tributaries (and downstream navigable waters) including sediments, chemicals, and other pollutants. Tributaries and their adjacent wetlands provide habitat (e.g., feeding, nesting, spawning, or rearing young) for many aquatic species that also live in traditional navigable waters.

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32 Id. at 2248. When applying the significant nexus standard to tributaries and wetlands, it is important to apply it within the limits of jurisdiction articulated in SWANCC. Justice Kennedy cites SWANCC with approval and asserts that the significant nexus standard, rather than being articulated for the first time in Rapanos, was established in SWANCC. 126 S. Ct. at 2246 (describing SWANCC as "interpreting the Act to require a significant nexus with navigable waters"). It is clear, therefore, that Justice Kennedy did not intend for the significant nexus standard to be applied in a manner that would result in assertion of jurisdiction over waters that he and the other justices determined were not jurisdictional in SWANCC. Nothing in this guidance should be interpreted as providing authority to assert jurisdiction over waters deemed non-jurisdictional by SWANCC.

33 126 S. Ct. at 2247-50.

34 Id. at 2241 (emphasis added).

When performing a significant nexus analysis,[35] the first step is to determine if the tributary has any adjacent wetlands. Where a tributary has no adjacent wetlands, the agencies will consider the flow characteristics and functions of only the tributary itself in determining whether such tributary has a significant effect on the chemical, physical and biological integrity of downstream traditional navigable waters. A tributary, as characterized in Section 2 above, is the entire reach of the stream that is of the same order (i.e., from the point of confluence, where two lower order streams meet to form the tributary, downstream to the point such tributary enters a higher order stream). For purposes of demonstrating a connection to traditional navigable waters, it is appropriate and reasonable to assess the flow characteristics of the tributary at the point at which water is in fact being contributed to a higher order tributary or to a traditional navigable water. If the tributary has adjacent wetlands, the significant nexus evaluation needs to recognize the ecological relationship between tributaries and their adjacent wetlands, and their closely linked role in protecting the chemical, physical, and biological integrity of downstream traditional navigable waters.

Therefore, the agencies will consider the flow and functions of the tributary together with the functions performed by all the wetlands adjacent to that tributary in evaluating whether a significant nexus is present. Similarly, where evaluating significant nexus for an adjacent wetland, the agencies will consider the flow characteristics and functions performed by the tributary to which the wetland is adjacent along with the functions performed by the wetland and all other wetlands adjacent to that tributary. This approach reflects the agencies' interpretation of Justice Kennedy's term "similarly situated" to include all wetlands adjacent to the same tributary. Where it is determined that a tributary and its adjacent wetlands collectively have a significant nexus with traditional navigable waters, the tributary and all of its adjacent wetlands are jurisdictional. Application of the significant nexus standard in this way is reasonable because of its strong scientific foundation – that is, the integral ecological relationship between a tributary and its adjacent wetlands. Interpreting the phrase "similarly situated" to include all wetlands adjacent to the same tributary is reasonable because such wetlands are physically located in a like manner (i.e., lying adjacent to the same tributary).

Principal considerations when evaluating significant nexus include the volume, duration, and frequency of the flow of water in the tributary and the proximity of the tributary to a traditional navigable water. In addition to any available hydrologic information (e.g., gauge data, flood predictions, historic records of water flow, statistical data, personal observations/records, etc.), the agencies may reasonably consider certain physical characteristics of the tributary to characterize its flow, and thus help to inform the determination of whether or not a significant nexus is present between the tributary and downstream traditional navigable waters. Physical indicators of flow may include the presence and characteristics of a reliable ordinary high water mark (OHWM) with a channel defined by bed and banks.[36] Other physical indicators of flow may include

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[35] In discussing the significant nexus standard, Justice Kennedy stated: "The required nexus must be assessed in terms of the statute's goals and purposes. Congress enacted the [CWA] to 'restore and maintain the chemical, physical, and biological integrity of the Nation's waters' ..." 126 S. Ct. at 2248. Consistent with Justice Kennedy's instruction, EPA and the Corps will apply the significant nexus standard in a manner that restores and maintains any of these three attributes of traditional navigable waters.

[36] See 33 C.F.R. § 328.3(e). The OHWM also serves to define the lateral limit of jurisdiction in a non-navigable tributary where there are no adjacent wetlands. See 33 C.F.R. § 328.4(c). While EPA regions

shelving, wracking, water staining, sediment sorting, and scour.[37] Consideration will also be given to certain relevant contextual factors that directly influence the hydrology of tributaries including the size of the tributary's watershed, average annual rainfall, average annual winter snow pack, slope, and channel dimensions.

In addition, the agencies will consider other relevant factors, including the functions performed by the tributary together with the functions performed by any adjacent wetlands. One such factor is the extent to which the tributary and adjacent wetlands have the capacity to carry pollutants (e.g., petroleum wastes, toxic wastes, sediment) or flood waters to traditional navigable waters, or to reduce the amount of pollutants or flood waters that would otherwise enter traditional navigable waters.[38] The agencies will also evaluate ecological functions performed by the tributary and any adjacent wetlands which affect downstream traditional navigable waters, such as the capacity to transfer nutrients and organic carbon vital to support downstream foodwebs (e.g., macroinvertebrates present in headwater streams convert carbon in leaf litter making it available to species downstream), habitat services such as providing spawning areas for recreationally or commercially important species in downstream waters, and the extent to which the tributary and adjacent wetlands perform functions related to maintenance of downstream water quality such as sediment trapping.

After assessing the flow characteristics and functions of the tributary and its adjacent wetlands, the agencies will evaluate whether the tributary and its adjacent wetlands are likely to have an effect that is more than speculative or insubstantial on the chemical, physical, and biological integrity of a traditional navigable water. As the distance from the tributary to the navigable water increases, it will become increasingly important to document whether the tributary and its adjacent wetlands have a significant nexus rather than a speculative or insubstantial nexus with a traditional navigable water.

Accordingly, Corps districts and EPA regions shall document in the administrative record the available information regarding whether a tributary and its adjacent wetlands have a significant nexus with a traditional navigable water, including the physical indicators of flow in a particular case and available information regarding the functions of the tributary and any adjacent wetlands. The agencies will explain their basis for concluding whether or not the tributary and its adjacent wetlands, when considered together, have a more than speculative or insubstantial effect on the chemical, physical, and biological integrity of a traditional navigable water.

Swales or erosional features (e.g., gullies, small washes characterized by low volume, infrequent, or short duration flow) are generally not waters of the United States

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and Corps districts must exercise judgment to identify the OHWM on a case-by-case basis, the Corps' regulations identify the factors to be applied. These regulations have recently been further explained in Regulatory Guidance Letter (RGL) 05-05 (Dec. 7, 2005). The agencies will apply the regulations and the RGL and take other steps as needed to ensure that the OHWM identification factors are applied consistently nationwide.

[37] See Justice Kennedy's discussion of "physical characteristics," 126 S. Ct. at 2248-2249.

[38] See, generally, 126 S. Ct. at 2248-53; see also 126 S. Ct. at 2249 ("Just as control over the non-navigable parts of a river may be essential or desirable in the interests of the navigable portions, so may the key to flood control on a navigable stream be found in whole or in part in flood control on its tributaries....") (citing to Oklahoma ex rel. Phillips v. Guy F. Atkinson Co., 313 U.S. 508, 524-25(1941)).

because they are not tributaries or they do not have a significant nexus to downstream traditional navigable waters. In addition, ditches (including roadside ditches) excavated wholly in and draining only uplands and that do not carry a relatively permanent flow of water are generally not waters of the United States because they are not tributaries or they do not have a significant nexus to downstream traditional navigable waters.[39] Even when not jurisdictional waters subject to CWA §404, these geographic features (e.g., swales, ditches) may still contribute to a surface hydrologic connection between an adjacent wetland and a traditional navigable water. In addition, these geographic features may function as point sources (i.e., "discernible, confined, and discrete conveyances"), such that discharges of pollutants to other waters through these features could be subject to other CWA regulations (e.g., CWA §§ 311 and 402).[40]

Certain ephemeral waters in the arid west are distinguishable from the geographic features described above where such ephemeral waters are tributaries and they have a significant nexus to downstream traditional navigable waters. For example, in some cases these ephemeral tributaries may serve as a transitional area between the upland environment and the traditional navigable waters. During and following precipitation events, ephemeral tributaries collect and transport water and sometimes sediment from the upper reaches of the landscape downstream to the traditional navigable waters. These ephemeral tributaries may provide habitat for wildlife and aquatic organisms in downstream traditional navigable waters. These biological and physical processes may further support nutrient cycling, sediment retention and transport, pollutant trapping and filtration, and improvement of water quality, functions that may significantly affect the chemical, physical, and biological integrity of downstream traditional navigable waters.

Documentation

As described above, the agencies will assert CWA jurisdiction over the following waters without the legal obligation to make a significant nexus determination: traditional navigable waters and wetlands adjacent thereto, non-navigable tributaries that are relatively permanent waters, and wetlands with a continuous surface connection with such tributaries. The agencies will also decide CWA jurisdiction over other non-navigable tributaries and over other wetlands adjacent to non-navigable tributaries based on a fact-specific analysis to determine whether they have a significant nexus with traditional navigable waters. For purposes of CWA §404 determinations by the Corps, the Corps and EPA are developing a revised form to be used by field regulators for documenting the assertion or declination of CWA jurisdiction.

Corps districts and EPA regions will ensure that the information in the record adequately supports any jurisdictional determination. The record shall, to the maximum extent practicable, explain the rationale for the determination, disclose the data and information relied upon, and, if applicable, explain what data or information received greater or lesser weight, and what professional judgment or assumptions were used in reaching the determination. The Corps districts and EPA regions will also demonstrate and document in the record that a particular water either fits within a class identified above as not requiring a significant nexus determination, or that the water has a

[39] See 51 Fed. Reg. 41206, 41217 (Nov. 13, 1986).
[40] 33 U.S.C. § 1362(14).

significant nexus with a traditional navigable water. As a matter of policy, Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

All pertinent documentation and analyses for a given jurisdictional determination (including the revised form) shall be adequately reflected in the record and clearly demonstrate the basis for asserting or declining CWA jurisdiction.[41] Maps, aerial photography, soil surveys, watershed studies, local development plans, literature citations, and references from studies pertinent to the parameters being reviewed are examples of information that will assist staff in completing accurate jurisdictional determinations. The level of documentation may vary among projects. For example, jurisdictional determinations for complex projects may require additional documentation by the project manager.

Benjamin H. Grumbles
Assistant Administrator for Water
U.S. Environmental Protection Agency

John Paul Woodley, Jr.
Assistant Secretary of the Army
(Civil Works)
Department of the Army

[41] For jurisdictional determinations and permitting decisions, such information shall be posted on the appropriate Corps website for public and interagency information.

Appendix D: TNW determinations, Los Angeles District

See following page.

CESPL-RG-A March 12, 2008

REGULATORY DIVISION MEMORANDUM

SUBJECT: Traditional Navigable Waters, Navigable In-Fact Determination for the Gila River

1. To provide documentation to determine the status of navigability of the Gila River in Arizona from Coolidge Dam to Winkelman in accordance with Appendix D of the *Rapanos* Guidance for purposes of Section 404 of the Clean Water Act. See Appendix A for topographic map of the proposed reach.

2. The Gila drainage basin includes 56,570 square miles in Arizona and New Mexico. The Gila River originates in New Mexico and is joined by several major tributaries including the San Pedro River near Winkelman and the Santa Cruz River, the Salt River and the Hassayampa River near Phoenix on its way to join the Colorado River at Yuma, Arizona. The Upper Gila River watershed (USGS subregion 1504) comprises about 12,850 square miles in southwestern New Mexico and southeastern Arizona above Coolidge Dam. The USGS Surface Water statistics (Appendix B) illustrate flows within the 30 mile reach from Coolidge Dam to Winkelman, Arizona. Coolidge Dam was completed in November 1928. Filling of the San Carlos Reservoir began in 1929 with the first release of water for irrigation in 1930.

The Gila River from Coolidge Dam to Winkelman flows perennially due to releases from the dam. There is a USGS gauge (09469500) below Coolidge Dam and a USGS gauge (09470000) at Winkelman. According to the USGS gauges at Coolidge Dam and Winkelman daily average flows were predominately greater than 100 cfs any day or month of the year since 1898 (Appendix B). Due to these flows this reach supports a dense canopy of riparian vegetation to include Cottonwood, Sycamore, Alders and Tamarisk (Appendix C).

In the 1980’s and early 1990’s commercial river floating operations began to obtain permits from the US Bureau of Land Management (BLM) for the use of public lands in connection with the commercial guide operations. According to an article from the Arizona Daily Wildcat dated June 5, 1996, (Appendix E) the river was being used by a commercial guided raft touring company called Desert Voyagers. These day trips start at Dripping Springs Wash and continued ten miles downstream. In addition, a Clean Water Act Section 404 nationwide permit for a boat ramp was issued on November 14, 1989 to Whole Earth Adventures; one of the rafting companies that the Town of Winkelman allowed the use of Winkelman Flats Public Park as a boat take out area (Appendix F).

BLM completed an environmental assessment in 2003 for the issuance of permits for commercial recreation use related to non-motorized river floating (Appendix G). As stated above, and according to the Town of Winkelman, commercial river operations have occurred since 1996. Although water levels have dropped in recent years there is non-commercial floating and tubing that still occur. In the past year, flows have improved and there has been interest in resuming commercial floating operations. Based on the increasing population in the state of Arizona and the proximity of this site to the metropolitan Phoenix area, it would be expected that there would be increased recreation in this reach to include commercial river floating operations.

3. Based on the documentation presented herein, I have made the following determinations:

The Gila River from Coolidge Dam to Winkelman is a traditional navigable water (TNW).

David Castanon
Chief, Regulatory Division
Los Angeles District

DEPARTMENT OF THE ARMY
SOUTH PACIFIC DIVISION, U.S. ARMY CORPS OF ENGINEERS
1455 MARKET STREET
SAN FRANCISCO, CALIFORNIA 94103-1399

REPLY TO
ATTENTION OF

17 OCT 2008

CESPD-DE

MEMORANDUM FOR Commander, Los Angeles District (ATTN: CESPL-RG)

SUBJECT: Final Determination of "Traditional Navigable Water" Status for the Lower Gila River, Arizona.

1. References:

a. Memorandum, ASA(CW), 24 Sep 08, subject: Traditional Navigable Water Determinations Under the Clean Water Act.

b. Report of Findings on the Traditional Navigable Water Status Under the Clean Water Act for 6.9-Mile Reach of the Lower Gila River, Arizona, 30 Sep 08.

c. Memorandum for Record, CESPD-PDS-O, 16 Oct 08, subject: Traditional Navigable Water Determination for a 6.9-mile Reach of the Lower Gila River in Maricopa County, Arizona.

2. In accordance with Ref. 1.a., I have determined the 6.9-mile reach of the lower Gila River to be a "traditional navigable water" from Powers Butte to Gillespie Dam in Maricopa County, Arizona. This determination is based upon my review of the factual evidence and findings provided in Ref. 1.b. and evaluated in Ref. 1.c. Accordingly, the Gila River within the 6.9-mile study reach is subject to Clean Water Act jurisdiction under 33 CFR § 328.3(a)(1). This "traditional navigable water" determination is supported by the Clean Water Act, the Corps of Engineers' implementing regulations at 33 CFR Parts 320-330, and existing guidance, including the *Rapanos Guidance* issued 5 Jun 2007. This "traditional navigable water" determination applies only to the 6.9-mile study reach of the lower Gila River, from Powers Butte to Gillespie Dam, in Maricopa County, Arizona.

3. If you have any questions concerning my "traditional navigable water" determination for the subject reach of the lower Gila River, please contact Mr. Wade Eakle, Regulatory Program Manager, at (415) 503-6577.

John R. McMahon
Brigadier General, U.S. Army
Commanding

CESPL-RG-A 23 May 2008

MEMORANDUM FOR THE RECORD

SUBJECT: Determination of Two Reaches of the Santa Cruz River as Traditional Navigable Waters (TNW)

Summary

The Corps' Los Angeles District has determined that two reaches of the Santa Cruz River, Study Reach A from Tubac gage station (USGS # 09481740) to the Continental gage station (USGS #09482000) and Study Reach B from Roger Road wastewater treatment plant (WWTP) downstream to the Pima/Pinal County line, Arizona, as shown in Exhibit A, are TNWs (collectively, referred to as the "Study Reaches"). This determination is consistent with the Clean Water Act (CWA), the agencies' regulations (including 33 C.F.R.§ 328.3), relevant case law, and existing guidance, including the June 5, 2007 joint U.S. Environmental Protection Agency and Department of the Army legal memorandum entitled *Clean Water Act Jurisdiction Following the U.S. Supreme Court's Decision in Rapanos v. United States & Carabell v. United States* (Rapanos Guidance) and *Appendix D* of the *U.S. Army Corps of Engineers Jurisdictional Determination Form Instructional Guidebook* issued June 5, 2007 (Appendix D).

Background

The Santa Cruz River originates in Arizona, flows south into Mexico, and then flows north again into Arizona. It is the primary river which flows from Nogales, Mexico through Tucson, Arizona, and a number of Indian reservations, including Tohono O'odham Nation (TON), to the Gila River near Phoenix. The watershed of the Santa Cruz River is approximately 8,600 square miles. Until the late nineteenth century, the Santa Cruz River was primarily a perennial watercourse that served the region's agricultural needs until a quickly developing industrial society began to tap the river's subsurface flow (Exhibit B).

The Upper Santa Cruz River Valley, located between Nogales, Arizona on the US-Mexico border, and extending 65 miles north to the major urban area of Tucson, has a long history of European settlement spanning three centuries. Prior to the discovery of the area by European explorers, the area was inhabited for thousands of years by aboriginal native peoples. The Santa Cruz River has long been an important corridor for trade and exploration. The river and its well-established riparian habitat have served as a vital commodity for people and wildlife in the region.[1]

In addition to the use of the Study Reaches by recreational watercraft described in case-specific analysis below, in the mid 1850s, William Rowlett and his brother, Alfred, constructed an earthen dam on the Santa Cruz River south of the present-day Silverlake Road. They also installed a water-powered flour mill at this location in 1857/58. In 1860, William Grant purchased the flour mill and the dam/lake and improved the dam and mill in order to supply military posts in the southwestern region. He built a second, larger mill on the river and purchased the machinery in California. However, the mill was burned in 1861 to keep it from falling into Confederate hands. The mill was purchased by James Lee and returned to operations in 1864. In 1884, the mill, dam,

[1] *The Santa Cruz River: A Resource Shared by Two Cities* by Hugh Holub, paper presented to the Border XXI EPA Regional Water Sub Work Group Meeting on March 6, 2001, Nogales, Sonora.

and lake were sold to Frederick Maish and Thomas Driscoll who developed the Silver Lake Resort. In 1883, Solomon Warner built a second dam and mill on the river. The lake was approximately 60 acres, 8 feet deep, and the *Arizona Citizen* reported the use of a flat-bottom boat on the lake. Waterfowl populated the lake and hunting organizations claimed exclusive rights to shooting the waterfowl. The dams at both Silver Lake and Warner's Lake were breached by floods in 1886 and 1887; the *Arizona Star* reported on July 13, 1887 that the river was wide and deep enough to float a "mammoth steamboat." In 1888, Frank and Warren Allison purchased Warner Lake, repaired the dam, and stocked the lake with carp for commercial fish production selling over 500 pounds of fish per day. Both dams were washed out by 1890.[2]

Further, in the summer of 1951, Glenton G. Syke, Tucson city engineer, navigated the Santa Cruz River in a 14-foot-long boat from the San Xavier del Bac Mission to Congress Street in Tucson.[3]

The Study Reaches were selected based on personal knowledge of the river by Regulatory staff, evidence of perennial flows based on stream gage data, and more readily available evidence of navigability.

<u>Basis for TNW Determination</u>

The Rapanos Guidance indicates that in its context, the term TNW refers to those waters that are under the jurisdiction of the Corps, pursuant to 33 C.F.R. § 328.3(a)(1), (i.e., "[a]ll waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide."

As stated in Appendix D: "when determining whether a water body qualifies as a "traditional navigable water" (i.e., an (a)(1) water), relevant considerations include whether a Corps District has determined that the water body is a navigable water of the United States pursuant to 33 C.F.R. § 320.14, or the water body qualifies as a navigable water of the United States under any of the tests set forth in 33 C.F.R. Part 329, or a federal court has determined that the water body is navigable-in-fact under federal law for any purpose, or the water body is "navigable-in-fact" under the standards that have been used by the federal courts."

To determine whether the Study Reaches are a TNW, in accordance to 33 C.F.R. § 328.3(a)(1), a case-specific analysis to evaluate whether the Study Reaches are navigable-in-fact, including consideration of its potential susceptibility to interstate and foreign commerce, was undertaken. The Corps has determined that the Study Reaches are a TNW based on the following factors:

1. The physical characteristics of the Santa Cruz River within the Study Reaches indicate that they have the capacity and susceptibility to be navigated by recreational watercraft.

A. Study Reach A is approximately 22 miles in length. The river near Tubac is typically more confined in ordinary flows to a channel approximately 15-20 feet wide with an approximate 1.5 mile wide, densely vegetated floodplain. Downstream of Amado, the floodplain increases in width to approximately 2.5 miles; the river channel is less confined, less vegetated, and more braided. Exhibit C shows monthly and daily flows for the Tubac, Amado, and Continental gage stations, as well as peak flows for the Amado and Continental gage stations (Tubac information unavailable). The monthly gage data indicate perennial flow at Tubac since

[2] History of Navigation of the Santa Cruz River by Don Bufkin, citation unknown.
[3] Admiral of the Santa Cruz by Glenton G. Sykes, The Journal of Arizona History, Vol. 20, Number 4, Winter, 1979.

1996, flow most months at the Amado gage station since 2003 (prior years unavailable), and intermittent flows at the Contintental gage station.[4] Average daily flows are typically lower in May and June but increase during the summer monsoon season which typically begins in July. Average daily flow rates again typically increase during December and January. The gage data indicate the highest daily mean value at the Tubac gage station over the last 11-12 years was 637 cubic feet per second (cfs) during October and the lowest daily mean value at the same station during the same period was 4.5 cfs during June. The highest daily mean values typically occur from July-October.[5] The range of mean monthly flows (6.9 to 78 cfs) and the average daily flow in a representative year of 35 cfs indicate perennial flow at the Tubac gage station. The mean monthly discharge information at the Amado gage station is only available since October, 2003; the mean monthly discharge at this station in the last four years varied from .97 cfs to 67 cfs while the daily mean flow chart at the Amado gage station indicates perennial flow. The mean monthly discharge at the Continental gage station since 1940 varies from .43 cfs to 76 cfs while the mean daily values since 1939 shows flow daily with the exception of mid to late May through mid-June. This is expected since the river begins subsurface flow at this point, which defines the downstream end of this Study Reach.

B. Study Reach B is approximately 32 miles in length. The width of the riverbed varies from approximately 280 feet at the Roger Road WWTP to approximately 670 feet at Cortaro and approximately 575 feet at Trico Road while the active (ordinary flow) river channel at all three locations varies from 40-60 feet; at one location within this Study Reach, the river diverges into two similarly-sized channels. The river in Study Reach B is often confined at its maximum width by steep banks with soil cement or other bank stabilization in several locations. In other locations, for example at Ina Road, the river has lower, easily accessible, vegetated banks. Some areas are more densely vegetated than others. Exhibit C shows monthly, daily, and peak flows for gage stations at Cortaro and Trico Road (just upstream of the Pima/Pinal County line). Average daily flows are typically lower in May and June but increase during the summer monsoon season which typically begins in July. Average daily flows again typically increase during December and January. The highest average daily mean value at the Cortaro gage station over the last 57-60 years was 703 cfs, also in October, and the lowest average daily mean value at the same station over the same period was 22 cfs during June. The average monthly discharge ranges from 23 to 124 cfs and the average daily flow in a representative year of 75 cfs indicate perennial flow at the Cortaro gage station. At the Trico Road gage station, since 1997, the average monthly discharge ranged from 3.5 cfs to 710 cfs and daily mean values since 1989 ranged from 11 cfs to 863 cfs. The gage data document perennial flow at the Cortaro and Trico Road gages every month since 1996 with the exception of October, 1996.[6]

C. The peak flow charts demonstrate the frequency of flows which exceed 1,000 cfs.[7] Peak flow data is unavailable at the Tubac gage station; however, the maximum peak flow at the Amado gage station since 2004 was approximately 7,800 cfs and peak flow has approached or exceeded 2,000 cfs annually. The maximum peak flow at the Continental gage station was approximately 45,000 cfs in the early 1980s and the minimum peak flow has exceeded 1,000 cfs 63 times since 1940. The maximum peak flow at the Cortaro gage station exceeded 60,000 cfs in the early 1980s and has exceeded 1,000 cfs on an annual basis from 1940-1988 with the exception of once in the 1940s and once in the 1950s; the peak flow at the Cortaro gage station

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[4] http://nwis.waterdata.usgs.gov/az/nwis/monthly
[5] http://nwis.waterdata.usgs.gov/az/nwis/dvstat
[6] Ibid
[7] http://nwis.waterdata.usgs.gov/az/nwis/peak

has also exceeded 1,000 cfs on an annual basis since approximately 1995. The maximum peak flow at the Trico gage station exceeded 25,000 cfs in 2007 and the minimum peak flow has been at or exceeded 1,000 cfs most years since 1989. The figures at the end of Exhibit C indicate the "real time" stages for late March-early April, 2008, at the Tubac, Cortaro, and Trico Road gage stations indicating flows in the river on a daily basis.[8] All three stations indicated flows with depths varying from 1-2 feet and no precipitation had occurred for approximately 6 weeks.[9] Additional real-time stage data obtained for late May is also provided for Tubac, Green Valley (near Continental), Cortaro, and Trico Road and indicates 1-2 feet of water currently in the channel at all the above locations. Extremely light precipitation occurred one day during this timeframe; however, the amount of precipitation received would not have been sufficient to cause surface flows[10]. A list of the large magnitude peak flow events of the Santa Cruz River over the last 100 years is provided at Exhibit D.[11]

D. While there is a variation in minimum flow required for canoeing, studies indicate the 95% confidence interval on the predicted minimum canoeing flow of 86 cfs for flatwater is 63 to 118 cfs.[12] Approximately two-three feet of water depth is sufficient to float a canoe, kayak, or small boat. Based on the above information, during most days from July-October and again for approximately half the months of December and January, there is sufficient flow in the Santa Cruz River within the Study Reaches to float a canoe (based on the average daily mean value). Typically a kayak would be able to navigate in lower flows and less water than canoes.

E. Based on aerial photographs attached at Exhibit E, the Santa Cruz River from Tubac gage station to just upstream of Continental gage station and Roger Road WWTP to the Pima/Pinal County line has uninterrupted flow.

F. The Arizona Department of Environmental Quality has adopted water quality standards for the Santa Cruz River for partial body contact.[13] Partial body contact allows for use of the surface water where the body comes into contact with the water but does not become fully submerged. Allowable uses under partial body contact would include but are not limited to boating and wading.

2. The Study Reaches within the Santa Cruz River have public accessibility.

A. The river has low banks in the vicinity of Tubac which allows for easy public access; these areas are currently frequented by riders on horseback. Resorts along the river provide access for out-of-state visitors for birding and hiking along the river.

B. Two Corps of Engineers feasibility studies for river restoration, El Rio Medio and Tres Rios del Norte, are in process. El Rio Medio will begin at Congress Street and progress downstream to Prince Road; Tres Rios del Norte will begin at Prince Road and progress

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[8] National Weather Service Advanced Hydrologic Prediction Service: http://www/nws.noaa.gov/oh/ahps/
[9] Personal observation, Marjorie Blaine, Senior Project Manager, Regulatory Division, Tucson Project Office
[10] Ibid
[11] http://www.wrh.noaa.gov/twc/hydro/floodhis.php
[12] Riparian Areas of the Southwestern United States: Hydrology, Ecology, and Management by Malchus B. Baker and Peter F. Ffolliott, CRC Press, 2004
[13] Personal communication with Steve Pawlowski, Arizona Department of Environmental Quality, Unit Manager, Water Quality Standards and Assessments, April 24, 2008.

downstream to Sanders Road in Marana. These projects will provide public trails along the river. Although the final design for these two projects has not been completed, it is likely river access will be provided. The two projects are shown in Exhibit F.

C. There is currently public access to the river at several bridges, including but not limited to the Ina Road bridge where there are pull-out areas, the Cortaro Road bridge (including a parking lot), and at the Sanders Road bridge in Marana. All of these bridges have easy access to Interstate 10.

D. The historic 1200-mile Juan Bautista de Anza National Historic Trail runs from Nogales, Arizona to San Francisco, California. This trail parallels and overlaps the Santa Cruz River in the Study Reaches. The river can be accessed at several points along this trail in the Study Reaches by auto or also on foot (Exhibit F).

3. The Study Reaches of the Santa Cruz River have been used for interstate commerce and have the potential to be used for commercial activities involving navigation and interstate commerce in the future.

A. Navigation has occurred historically and recent times within the Study Reaches of the Santa Cruz River.

(1) On August 23, 2005, as part of a promotion, a local radio show host navigated the Santa Cruz River in a raft for an unspecified distance starting at El Camino del Cerro (within Study Reach B) (Exhibit G).

(2) In October, 1994, two members of the Friends of the Santa Cruz navigated a 17-foot-long canoe from a point south of Tubac three miles to a point north of Tubac (Exhibit G).

B. The Santa Cruz River is an international and interstate water. Several areas along the river provide access for birding by out-of-state visitors and resorts bordering the river, such as the Tubac Golf Resort, host out-of-state visitors who partake in local recreation including hiking, horseback riding, and birding along the river. The Tucson Audubon Society's North Simpson Farm is an area where prolific riparian habitat restoration projects have been focused and it is well-known for its opportunities for birding. This type of “ecotourism” provides a significant water resource-oriented opportunity in the desert. The Study Reaches and other areas within the region receive many interstate and foreign tourists seeking to expand their “bird list”; the Sonoran Desert, particularly in riparian areas such as the Santa Cruz River, provides a significant opportunity to see species endemic to this area.

C. Use of the river within the Study Reaches by recreational watercraft provides evidence of the susceptibility for commercial use.

<u>Determination</u>

Public access points within of the Study Reaches such as low river banks, bridges, and trail systems, together with their physical characteristics, such as frequency, duration, and permanency of flow, indicate that the Study Reaches have the potential to be used for commercial recreational navigation activities, such as canoeing, kayaking, birding, nature and wildlife viewing. Such attractions and activities demonstrate that the Study Reaches may be susceptible to use in interstate commerce. Collectively, the above discussed factors demonstrate that the Study

Reaches are navigable-in-fact, and thus a TNW, susceptible to use in interstate commerce associated with recreational navigation activities. Therefore, I hereby determine that the Study Reaches are subject to the jurisdiction of Section 404 of the CWA, pursuant to 33 C.F.R. § 328.3(a)(1).

This determination does not 1) consider any other potentially applicable bases for determining CWA jurisdiction within the Study Reaches or 2) foreclose analysis of other areas of the Santa Cruz River outside the Study Reaches for purposes of determining CWA jurisdiction.

5/23/08
Date

Thomas H. Magness
Colonel, US Army
District Commander

Appendix E: Additional climatological information

Temperature: The region experienced large daily variations due to its relatively high altitude and the strong influence of the sun. Daily temperature variations can be as much as 43° F degrees with a mean variation of 18° F. Seasonal variations were considerable with the highest temperatures occurring in June, July, and August – with averages above 80° F and maximums over 100° F - while the lowest temperatures occur November through March – with averages below 50° F and minimums below 20° F. (Figure E-1)

Precipitation: Precipitation in the area was highly variable, with annual rainfalls as great as 18.54 inches of precipitation in water year 2017 (WY – 10/01/2016-09/30/2017) and as low as 5.59 inches of rainfall in WY2009 (Figure E-2). Averaged over the past 10 years of data at the Bagdad Airport weather station, precipitation was most prevalent in the late winter and spring months, February through June (Figure E-3).

The precipitation gage used to analyze trends was the Bagdad Airport weather station, which recorded precipitation data since May 25, 2006.[72] There were two precipitation gages installed in 2016 in Little Sycamore Wash, co-located with stream flow gages, but the period of record was too short to provide meaningful analysis.

Humidity: The high elevation and intense radiation from the sun created low relative humidity conditions. The lowest humidity occurred in the dry summer, with June averages below 15% relative humidity. The most humid periods aligned with the winter months and the late summer monsoon season (Figure E-4).

Sun Cover: Radiation from the sun was strong over the study area. According to studies by the National Renewable Energy Laboratory, the area was exposed to 7.1 to 7.9 kWh/m^2/day (Figure E-5). The intense radiation dried out the land through increased evaporation.

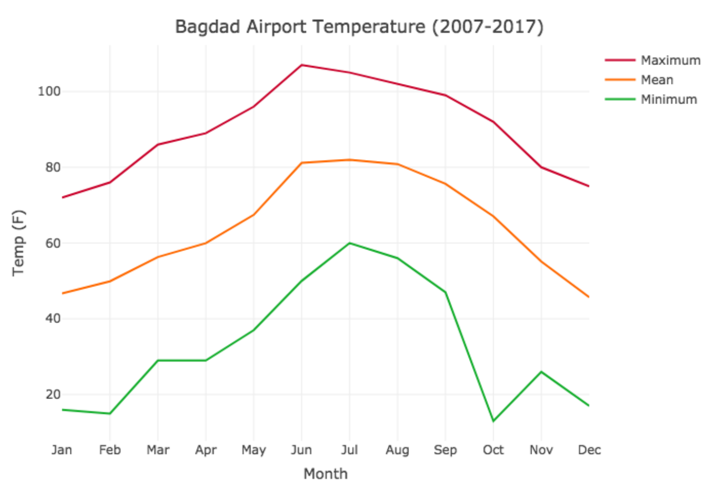

Figure E-1. Mean temperatures at the Bagdad Airport for the years 2007-2017.

[72] Yavapai County Flood Control District, "Weather Alert System" June 2018. http://weather.ycflood.com/.

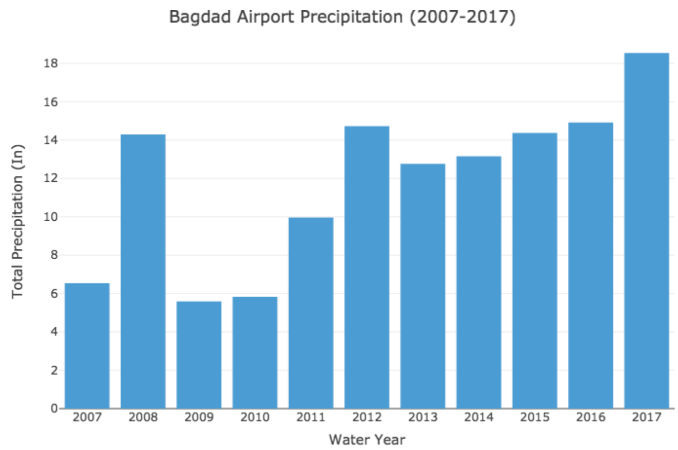

Figure E-2. Total precipitation for the water years shown. A water year runs from October 1st of the preceding year, through September 30th of the named year. The purpose is to keep data continuous for seasonality. Example: 10/01/20xx-1 to 09/30/20xx.

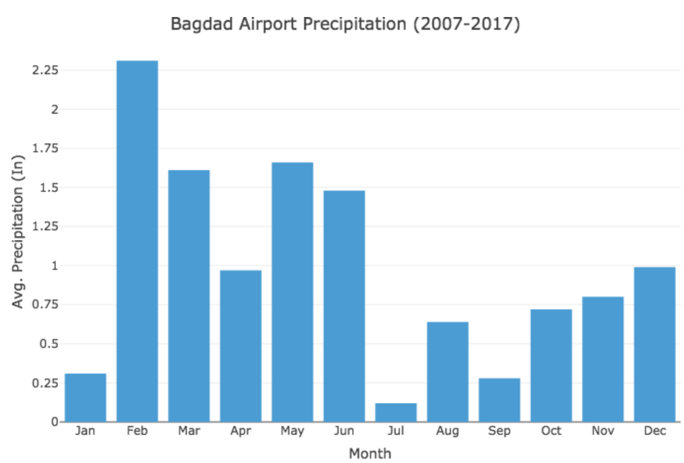

Figure E-3. Monthly average precipitation at Bagdad Airport, 2007-2017.

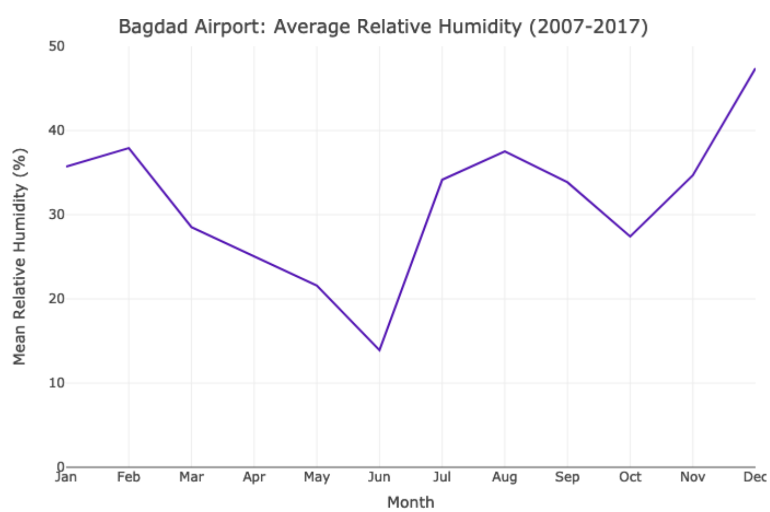

Figure E-4. Mean relative humidity of each month, measured at the Bagdad, AZ airport.

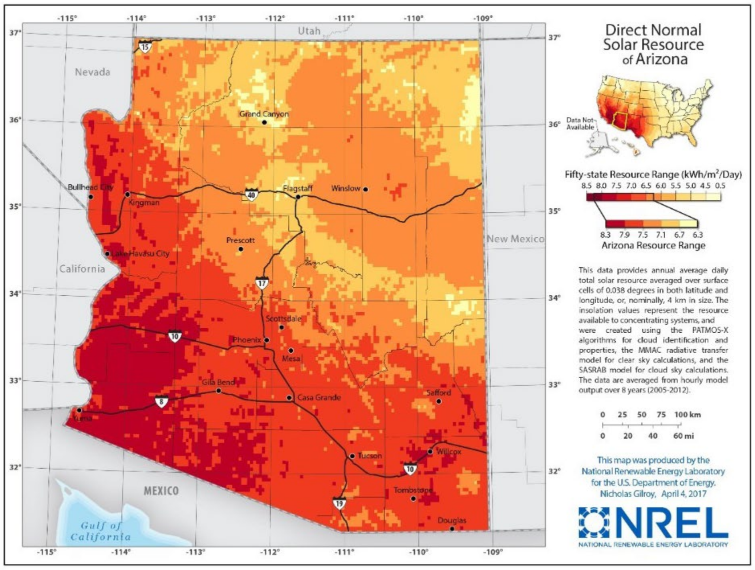

Figure E-5. National Renewable Energy Laboratory map of direct normal solar resources in Arizona. The study area lies nearly directly between Prescott and Lake Havasu City. Source: [https://www.nrel.gov/gis/solar.html .](https://www.nrel.gov/gis/solar.html)

Appendix F: Snapshot of streamflow in Little Sycamore Wash to the Santa Maria

As seen in Figure F-1, occasionally there was evident stream flow through Little Sycamore Wash, when no flow was present in the Santa Maria. On other occasions, such as in late February 2017 (Figure F-2), there were two simultaneous peaks in the hydrograph in Little Sycamore Wash and the Santa Maria. This may have indicated flow from the Wash contributing to the Santa Maria, or that a wide-spread precipitation event contributed to both streams at the same time. Peak travel time was approximately 8 hours, so the lagged flow would appear in these stream snapshots. Figure F-3 provides intuition of gage placement.

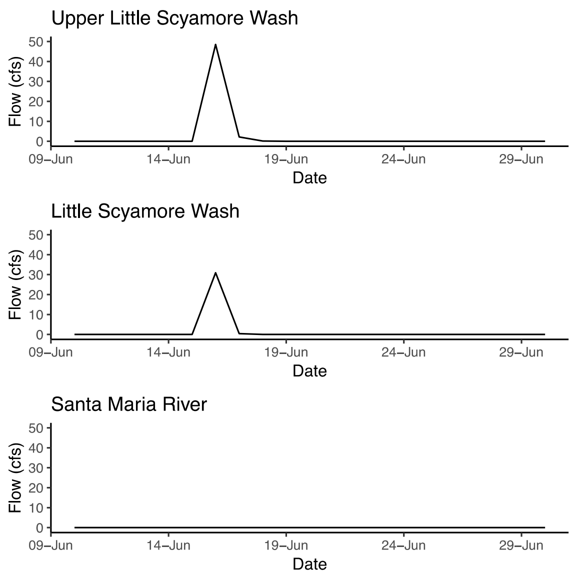

Figure F-1. Stream discharge progressively downstream in mid-June 2018

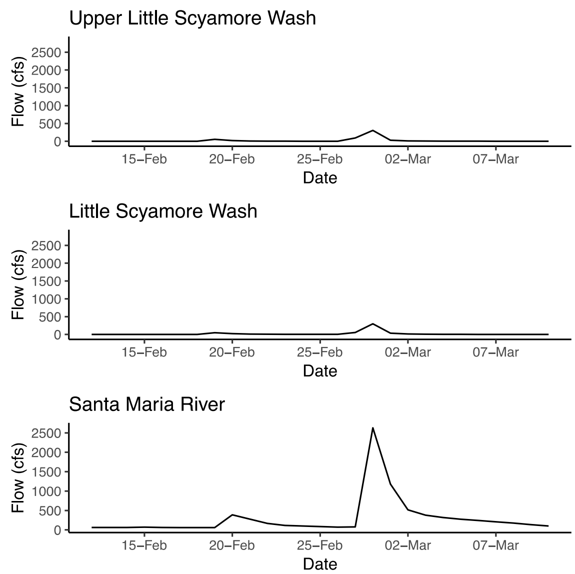

Figure F-2. Stream discharge progressively downstream in late February 2017

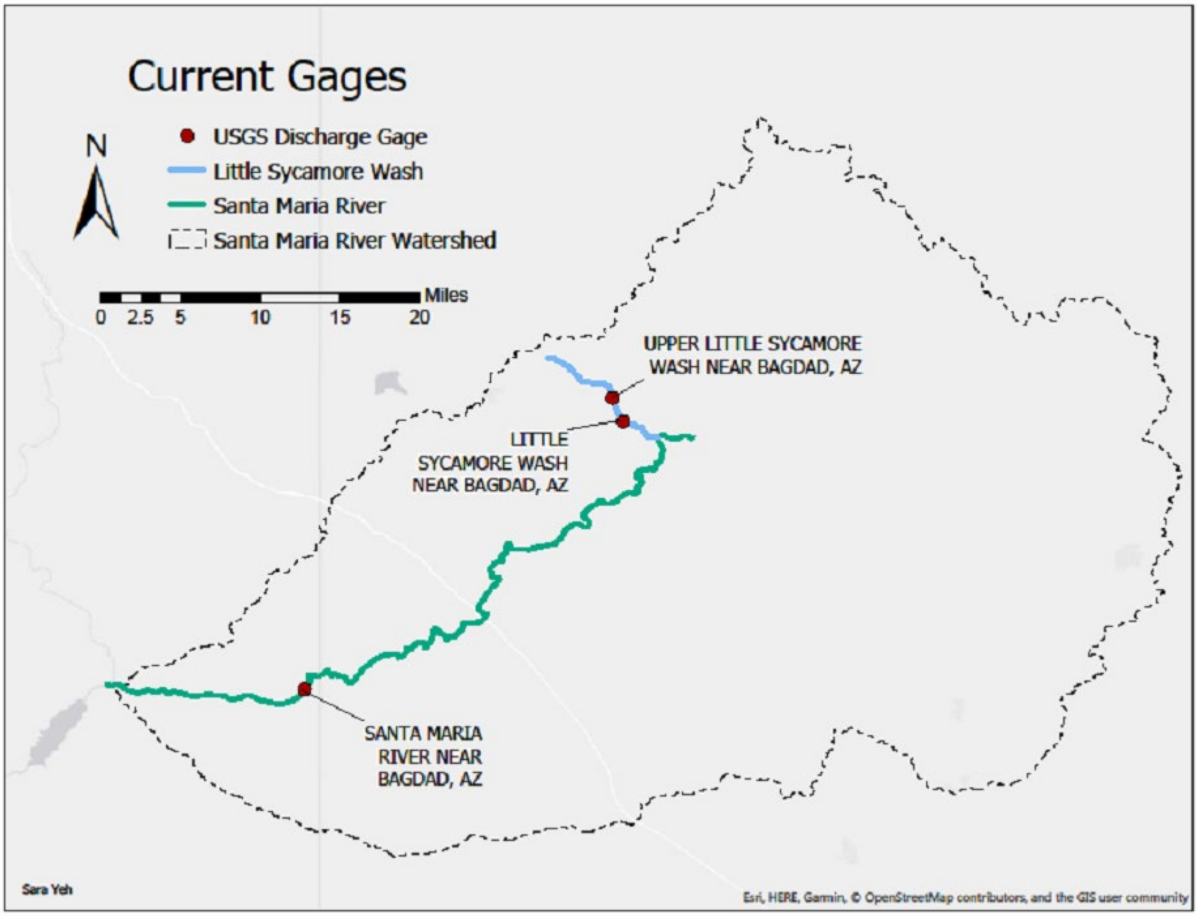

Figure F-3. Map of stream gages locations progressively downstream. (As of April 2019).

Appendix G: Runoff calculations

The National Streamflow Statistics (NSS) program by the USGS was used to determine the amount of runoff generated by a storm covering three sub-basins. Using a 30m Digital Elevation Model (DEM) of the study area, sub-basins were delineated based on the point of confluence for each tributary to the Santa Maria. For each of those sub-basins, area and mean elevation were calculated. Average precipitation for each sub-watershed was determined by taking an average of a grid of 30-year normal precipitation values covering from 1981-2010[73] which overlapped our study basins.

These values were input to the equation used for Arizona Region 3: Western Basin Range from the NSS (Table G-1). Calculation of lag time, the amount of time between when rainfall occurs and when streamflow is observed, is shown in Table G-2.

Watershed concentration times computed via Arizona Department of Transportation calculations for desert/mountain terrain, and lag time as 60% of concentration time.[74]

Table G-1: National Streamflow Statistics Calculation Inputs

Sub-Basin	Contributing Drainage Area (mi^2)	Mean Basin Elevation (ft)	Mean Annual Precipitation (in)	Lag Time (hr)
Little Sycamore Wash	22.06	3831.69	13.59	1.61
Sycamore Creek	236.87	4810.00	17.98	4.23
Kirkland Creek	404.10	4581.69	18.55	6.47

Table G-2: Lag Time Computation, as a derivative of Concentration Time

Sub-Basin	Main Stream Length (mi)	Total Area (mi^2)	Watercourse Slope (ft/mi)	Watercourse Length Perpendicular to Centroid (mi)	Concentration Time (hr)	Lag Time (hr)
Little Sycamore Wash	8.27	22.06	245.2	4.8	2.7	1.61
Sycamore Creek	23.59	236.9	116.3	15.9	7.0	4.23
Kirkland Creek	39.5	404.1	44.6	19.53	10.8	6.47

73 PRISM Climate Group, “PRISM Climate Data.” Oregon State University. June 2018. http://www.prism.oregonstate.edu/.

74 Arizona Dept. Of Transportation. *Highway Drainage Design Manual Hydrology. 1993. N0.4-2.*

Flow values were given in 15min increments and then linearly interpolated within a 5-minute time step in order to input into HEC-HMS as an inflow hydrograph (Figure G-1).

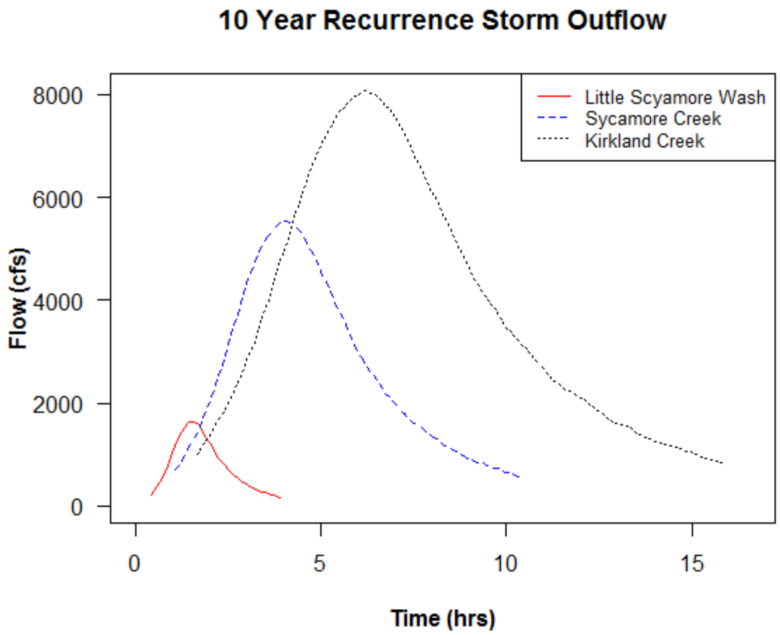

Figure G-1: Outflow hydrographs for each input sub-basin, as calculated using NSS equations.

Appendix H: Stream reach construction

Channel Width

The channel width along the Santa Maria river must be found in order to create a channel geometry within the model, in this case represented by a rectangle. From the National Hydrography Dataset (NHD) created by the USGS, twenty equally spaced profile locations were determined along the river centerline (Figure H- 1). At each profile point, a profile line was drawn perpendicular to streamflow in order to extract elevation values from the DEM (Figure H-2). The DEM had a spatial resolution to 30m, while vertical resolution was to the closest 0.1m. Due to the low spatial resolution available, (I.e. one height measurement for every 900 m^2 plot of land) channel width measurements had a large range of error. Conservative, smaller width estimates were assigned for each of the 20 profiles. These twenty locations along the stream were split into 4 segments that had similar characteristics (wide, vegetated downstream segment; narrow, rocky canyon walls upper segment etc.) and averaged to compose a river reach element in the HEC-HMS basin model (Table H-1).

USGS confirmed that the upper reaches of the Santa Maria near Bagdad the channel widths can be less than ¼ mile (1320 ft), and at its widest it was nearly a mile wide (5280 ft) from their own analysis of historic aerial photos.[75]

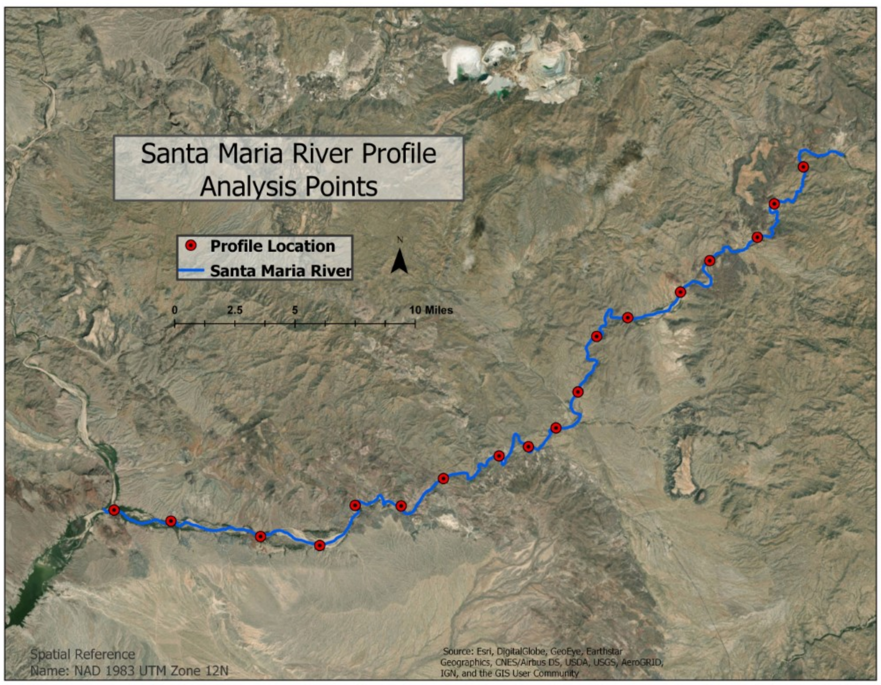

Figure H-1: Locations of where DEM profiles of the Santa Maria River were taken in order to approximate river width.

[75] Klawon, Jeanne. "Hydrology and Geomorphology of the Santa Maria And Big Sandy Rivers and Burro Creek, Western Arizona." *Arizona Geological Survey*, 2000. http://repository.azgs.az.gov/uri_gin/azgs/dlio/1055.

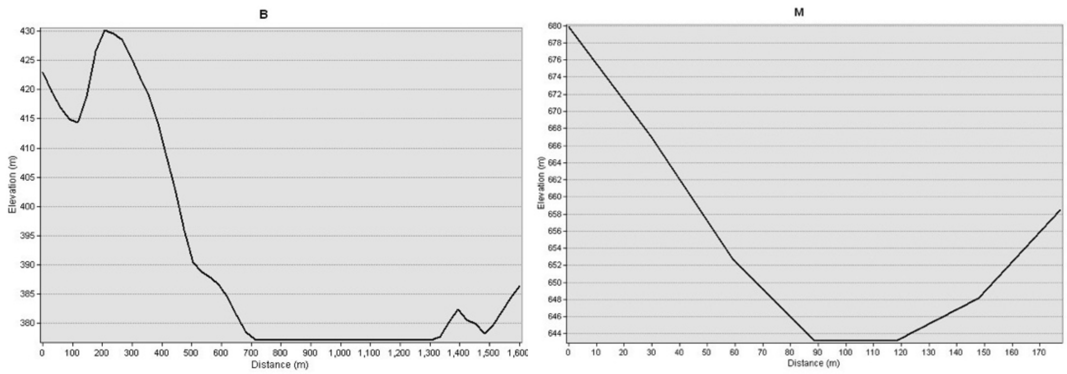

Figure H-2: Examples of a river profile extracted from the DEM used to approximate channel width for input into stream reach characteristics for HEC-HMS.

Table H-1: Santa Maria River Segment Widths

Section	Width (ft)	Length (mi)
Upper	197	2.0
Upper II	197	6.5
Middle	448	28.3
Lower	1729	14.2

Channel Roughness Coefficient

A manning's n value is a coefficient that represents the roughness of a channel. For all modeling, a n value of 0.04 was chosen. This was based on the below suggested values by the Arizona Department of Water Resources' State Standard for Hydrologic Modeling Guidelines.[76] Base values for fine to coarse gravel range from 0.024 - 0.035. With the added consideration that the River channel is not straight, uniform, or notably stable, additional modifying values indicated that a manning roughness coefficient closer to 0.04 would be more representative of field conditions.

BASE VALUES (n_0) OF MANNING'S ROUGHNESS COEFFICIENT FOR STRAIGHT, UNIFORM, STABLE CHANNELS
(from Thomsen and Hjalmarson, 1991)

Channel Material	Size of Bed Material		Base Values, n_0	
	Millimeters	Inches	Benson and Dalrymple (1967)[a]	Chow (1959)[b]
Concrete	-------	-------	0.012-0.018	0.011
Rock Cut	-------	-------	-------	.025
Firm Soil	-------	-------	.025-.032	.020
Coarse Sand	1-2	-------	.026-.035	-------
Fine Gravel	-------	-------	-------	.024
Gravel	2-64	0.08-2.5	.028-.035	-------
Coarse Gravel	-------	-------	-------	.028
Cobble	64-256	2.50-10.0	.030-.050	-------
Boulder	>256	>10.0	.040-.070	-------

[a]Straight uniform channel.
[b]Smoothest channel attainable in indicated material.

Figure H-3: Arizona State Standard Base Values of Manning's roughness coefficient.[77]

[76] Arizona Department of Water Resources. "State Standard for Hydrologic Modeling Guidelines." August 2007. https://new.azwater.gov/sites/default/files/Hydrology_State_Standard.pdf.
[77] Ibid.

Appendix I: Stream width sensitivity

In order to explore stream width's influence on modeled outflows a sensitivity analysis was performed. A range of -20% to +10% widths were run to reveal the effect on final discharge (Table 1). The width values do not notably change the percolation value of connectivity until a change is 20%.

Table I-1. Adjusted channel widths (ft) for each stream segment with positive and negative percent changes in width

		Percent Change in Width						
		-20%	**-10%**	**-5%**	**0**	**5%**	**10%**	**20%**
Channel Section	**Upper**	157.44	177.12	186.96	196.8	206.64	216.48	236.16
	Middle	358.24	403.02	425.41	447.8	470.19	492.58	537.36
	Lower	1383.04	1555.92	1642.36	1728.8	1815.24	1901.68	2074.56

Table I-2. Outflow (acre-ft) at Alamo when 3 sub-basin flow is modeled through adjusted width channels.

		Percent Change in Width						
		-20%	**-10%**	**-5%**	**0**	**5%**	**10%**	**20%**
Percolation Rate (cfs/acre)	**0**	7715	7767	7792	7817	7837	7861	7904
	0.5	5140	4930	4829	4729	4632	4538	4356
	1	3542	3219	3064	2912	2764	2620	2346
	1.5	2277	1894.2	1716	1545	1382	1225	936
	2	1299	914	743	586	444	317	120
	2.5	575	256	138	54.8	15	5.7	1.5
	3	117	9	3.7	1.8	1	0.6	0
	3.5	5.3	1.2	0.7	0	0	0	0
	4	1.2	0	0	0	0	0	0
	4.5	0	0	0	0	0	0	0
	5	0	0	0	0	0	0	0
	5.5	0	0	0	0	0	0	0
	6	0	0	0	0	0	0	0

Appendix J: CWA Section 404(g) (et seq)

(g)(1) The Governor of any State desiring to administer its own individual and general permit program for the discharge of dredged or fill material into the navigable waters (other than those waters which are presently used, or are susceptible to use in their natural condition or by reasonable improvement as a means to transport interstate or foreign commerce shoreward to their ordinary high water mark, including all waters which are subject to the ebb and flow of the tide shoreward to their mean high water mark, or mean higher high water mark on the west coast, including wetlands adjacent thereto), within its jurisdiction may submit to the Administrator a full and complete description of the program it proposes to establish and administer under State law or under an interstate compact. In addition, such State shall submit a statement from the attorney general (or the attorney for those State agencies which have independent legal counsel), or from the chief legal officer in the case of an interstate agency, that the laws of such State, or the interstate compact, as the case may be, provide adequate authority to carry out the described program.
(2) Not later than the tenth day after the date of the receipt of the program and statement submitted by any State under paragraph (1) of this subsection, the Administrator shall provide copies of such program and statement to the Secretary and the Secretary of the Interior, acting through the Director of the United States Fish and Wildlife Service.
(3) Not later than the ninetieth day after the date of the receipt by the Administrator of the program and statement submitted by any State, under paragraph (1) of this subsection, the Secretary and the Secretary of the Interior, acting through the Director of the United States Fish and Wildlife Service, shall submit any comments with respect to such program and statement to the Administrator in writing.

(h)(1) Not later than the one-hundred-twentieth day after the date of the receipt by the Administrator of a program and statement submitted by any State under paragraph (1) of this subsection, the Administrator shall determine, taking into account any comments submitted by the Secretary and the Secretary of the Interior, acting through the Director of the United States Fish and Wildlife Service, pursuant to subsection (g) of this section, whether such State has the following authority with respect to the issuance of permits pursuant to such program: (A) To issue permits which-- (i) apply and assure compliance with, any applicable requirements of this section, including, but not limited to, the guidelines established under section (b)(1) of this section, and sections 307 and 403 of this Act; (ii) are for fixed terms not exceeding five years; and (iii) can be terminated or modified for cause including, but not limited to, the following: (I) violation of any condition of the permit; (II) obtaining a permit by misrepresentation, or failure to disclose fully all relevant facts; (III) change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge. (B) To issue permits which apply, and assure compliance with, all applicable requirements of section 308 of this Act, or to inspect, monitor, enter, and require reports to at least the same extent as required in section 308 of this Act. (C) To assure that the public, and any other State the waters of which may be affected, receive notice of each application for a permit and to provide an opportunity for public hearing before a ruling on each such application. (D) To assure that the Administrator receives notice of each application (including a copy thereof) for a permit. (E) To assure that any State (other than the permitting State), whose waters may be affected by the issuance of a permit may submit written recommendation to the permitting State (and the Administrator) with respect to any permit application and, if any part of such written recommendations are not accepted by the permitting State, that the permitting State will notify such affected State (and the Administrator) in writing of its failure to so accept such recommendations together with its reasons for so doing. (F) To assure that no permit will be issued if, in the judgment of the Secretary, after consultation with the Secretary of the department in

which the Coast Guard is operating, anchorage and navigation of any of the navigable water would be substantially impaired thereby. (G) To abate violations of the permit or the permit program, including civil and criminal penalties and other ways and means of enforcement. (H) To assure continued coordination with Federal and Federal-State water-related planning and review processes.
(2) If, with respect to a State program submitted under subsection (g)(1) of this section, the Administrator determines that such State-- (A) has the authority set forth in paragraph (1) of this subsection, the Administrator shall approve the program and so notify (i) such State, and (ii) the Secretary, who upon subsequent notification from such State that it is administering such program, shall suspend the issuance of permits under subsection (a) and (e) of this section for activities with respect to which a permit may be issued pursuant to such State program; or (B) does not have the authority set forth in paragraph (1) of this subsection, the Administrator shall so notify such State, which notification shall also describe the revisions or modifications necessary so that such State may resubmit such program for a determination by the Administrator under this subsection.
(3) If the Administrator fails to make a determination with respect to any program submitted by a State under subsection (g)(1) of this section within one-hundred-twenty days after the date of the receipt of such program, such program shall be deemed approved pursuant to paragraph (2)(A) of this subsection and the Administrator shall so notify such State and the Secretary who, upon subsequent notification from such State that it is administering such program, shall suspend the issuance of permits under subsection (a) and (e) of this section for activities with respect to which a permit may be issued by such State.
(4) After the Secretary receives notification from the Administrator under paragraph (2) or (3) of this subsection that a State permit program has been approved, the Secretary shall transfer any applications for permits before the Secretary for activities with respect to which a permit may be issued pursuant to such State program to such State for appropriate action.
(5) Upon notification from a State with a permit program approved under this subsection that such State intends to administer and enforce the terms and conditions of a general permit issued by the Secretary under subsection (e) of this section with respect to activities in such State to which such general permit applies, the Secretary shall suspend the administration and enforcement of such general permit with respect to such activities.

(i) Whenever the Administrator determines after public hearing that a State is not administering a program approved under section (h)(2)(A) of this section, in accordance with this section, including, but not limited to, the guidelines established under subsection (b)(1) of this section, the Administrator shall so notify the State, and, if appropriate corrective action is not taken within a reasonable time, not to exceed ninety days after the date of the receipt of such notification, the Administrator shall (1) withdraw approval of such program until the Administrator determines such corrective action has been taken, and (2) notify the Secretary that the Secretary shall resume the program for the issuance of permits under subsections (a) and (e) of this section for activities with respect to which the State was issuing permits and that such authority of the Secretary shall continue in effect until such time as the Administrator makes the determination described in clause (l) of this subsection and such State again has an approved program.

(j) Each State which is administering a permit program pursuant to this section shall transmit to the Administrator (1) a copy of each permit application received by such State and provide notice to the Administrator of every action related to the consideration of such permit application, including each permit proposed to be issued by such State, and (2) a copy of each proposed general permit which such State intends to issue. Not later than the tenth day after the date of the receipt of such permit application or such proposed general permit, the Administrator shall provide copies of such permit application or such proposed general permit to the Secretary and the Secretary of the Interior, acting through the Director of the United States Fish and Wildlife Service. If the Administrator intends to provide written comments to such State with respect to such permit application or such proposed general permit, he shall so notify such State not later than the thirtieth day after the date of the receipt of such application or such proposed general permit and provide such written comments to such State, after consideration of any comments made in writing with respect to such application or such proposed general permit by the Secretary and the Secretary of the Interior, acting through the Director of the United States Fish and Wildlife Service, not later than the ninetieth day after the date of such receipt. If such State is so notified by the Administrator, it shall not issue the proposed permit until after the receipt of such comments from the Administrator, or after such ninetieth day, whichever first occurs. Such State shall not issue such proposed permit after such ninetieth day if it has received such written comments in which the Administrator objects (A) to the issuance of such proposed permit and such proposed permit is one that has been submitted to the Administrator pursuant to subsection (h)(1) (E), or (B) to the issuances of such proposed permit as being outside the requirements of this section, including, but not limited to, the guidelines developed under subsection (b)(1) of this section unless it modifies such proposed permit in accordance with such comments. Whenever the Administrator objects to the issuance of a permit under the preceding sentence such written objection shall contain a statement of the reasons for such objection and the conditions which such permit would include if it were issued by the Administrator. In any case where the Administrator objects to the issuance of a permit, on request of the State, a public hearing shall be held by the Administrator on such objection. If the State does not resubmit such permit revised to meet such objection within 30 days after completion of the hearing or, if no hearing is requested within 90 days after the date of such objection, the Secretary may issue the permit pursuant to subsection (a) or (e) of this section, as the case may be, for such source in accordance with the guidelines and requirements of this Act.

(k) In accordance with guidelines promulgated pursuant to subsection (h)(2) of section 304 of this Act, the Administrator is authorized to waive the requirements of subsection (j) of this section at the time of the approval of a program pursuant to subsection (h)(2)(A) of this section for any category (including any class, type, or size within such category) of discharge within the State submitting such program.

(l) The Administrator shall promulgate regulations establishing categories of discharges which he determines shall not be subject to the requirements of subsection (j) of this section in any State with a program approved pursuant to subsection (h)(2)(A) of this section. The Administrator may distinguish among classes, types, and sizes within any category of discharges.

(m) Not later than the ninetieth day after the date on which the Secretary notifies the Secretary of the Interior, acting through the Director of the United States Fish and Wildlife Service that (1) an application for a permit under subsection (a) of this section has been received by the Secretary, or (2) the Secretary proposes to issue a general permit under subsection (e) of this section, the Secretary of the Interior, acting through the Director of the United States Fish and Wildlife Service, shall submit any comments with respect to such application or such proposed general permit in writing to the Secretary.

(n) Nothing in this section shall be construed to limit the authority of the Administrator to take action pursuant to section 309 of this Act.

(o) A copy of each permit application and each permit issued under this section shall be available to the public. Such permit application or portion thereof, shall further be available on request for the purpose of reproduction.

(p) Compliance with a permit issued pursuant to this section, including any activity carried out pursuant to a general permit issued under this section, shall be deemed compliance, for purposes of sections 309 and 505, with sections 301, 307, and 403.

(q) Not later than the one-hundred-eightieth day after the date of enactment of this subsection, the Secretary shall enter into agreements with the Administrator, the Secretaries of the Departments of Agriculture, Commerce, Interior, and Transportation, and the heads of other appropriate Federal agencies to minimize, to the maximum extent practicable, duplication, needless paperwork, and delays in the issuance of permits under this section. Such agreements shall be developed to assure that, to the maximum extent practicable, a decision with respect to an application for a permit under subsection (a) of this section will be made not later than the ninetieth day after the date the notice of such application is published under subsection (a) of this section.

(r) The discharge of dredged or fill material as part of the construction of a Federal project specifically authorized by Congress, whether prior to or on or after the date of enactment of this subsection, is not prohibited by or otherwise subject to regulation under this section, or a State program approved under this section, or section 301(a) or 402 of the Act (except for effluent standards or prohibitions under section 307), if information on the effects of such discharge, including consideration of the guidelines developed under subsection (b)(1) of this section, is included in an environmental impact statement for such project pursuant to the National Environmental Policy Act of 1969 and such environmental impact statement has been submitted to Congress before the actual discharge of dredged or fill material in connection with the construction of such project and prior to either authorization of such project or an appropriation of funds for each construction.

(s)(1) Whenever on the basis of any information available to him the Secretary finds that any person is in violation of any condition or limitation set forth in a permit issued by the Secretary under this section, the Secretary shall issue an order requiring such persons to comply with such condition or limitation, or the Secretary shall bring a civil action in accordance with paragraph (3) of this subsection.
(2) A copy of any order issued under this subsection shall be sent immediately by the Secretary to the State in which the violation occurs and other affected States. Any order issued under this subsection shall be by personal service and shall state with reasonable specificity the nature of the violation, specify a time for compliance, not to exceed thirty days, which the Secretary determines is reasonable, taking into account the seriousness of the violation and any good faith efforts to comply with applicable requirements. In any case in which an order under this subsection is issued to a corporation, a copy of such order shall be served on any appropriate corporate officers.
(3) The Secretary is authorized to commence a civil action for appropriate relief, including a permanent or temporary injunction for any violation for which he is authorized to issue a compliance order under paragraph (1) of this subsection. Any action under this paragraph may be brought in the district court of the United States for the district in which the defendant is located or resides or is doing business, and such court shall have jurisdiction to restrain such violation and to require compliance. Notice of the commencement of such action shall be given immediately to the appropriate State.
(4) Any person who violates any condition or limitation in a permit issued by the Secretary under this section, and any person who violates any order issued by the Secretary under paragraph (1) of this subsection, shall be subject to a civil penalty not to exceed $25,000 per day for each violation. In determining the amount of a civil penalty the court shall consider the seriousness of the violation or violations, the economic benefit (if any) resulting from the violation, any history of such violations, any good-faith efforts to comply with the applicable requirements, the economic impact of the penalty

on the violator, and such other matters as justice may require. [Former 404(s)(4) deleted and (5) amended and redesignated as (4) by PL 100-4]

(t) Nothing in this section shall preclude or deny the right of any State or interstate agency to control the discharge of dredged or fill material in any portion of the navigable waters within the jurisdiction of such State, including any activity of any Federal agency, and each such agency shall comply with such State or interstate requirements both substantive and procedural to control the discharge of dredged or fill material to the same extent that any person is subject to such requirements. This section shall not be construed as affecting or impairing the authority of the Secretary to maintain navigation.

Appendix K: Working group members

ADEQ CWA 404 Permit Program Assumption: **Technical Working Groups**

Updated Sept. 10, 2018

ADEQ

Compensatory Mitigation

Mark Edelman, Arizona State Land Dept

- Amanda Best, WestLand Resources, Inc.
- Amanda McGennis, Arizona Chapter Associated General Contractor
- Angela Garcia, Salt River Pima-Maricopa Indian Community
- Bob Iannarino, Psomas
- Brenna White, Department of Interior, National Park Service
- Dave Kimball, Gallagher & Kennedy on behalf of Freeport McMoRan
- Joe Bardswich, Golden Vertex Corp.
- Jonathan Horst, Tucson Audubon Society
- Julia Fonseca, Pima County Sustainability
- Keith E. Knutson, Arizona Game and Fish Dept
- Michael Byrd, Prescott Creeks
- Myron Smith, Carlota Copper Company
- Robert Anderson, Fennemore Craig
- Shawn Lowery, AGFD
- Spencer Kamps, Home Builders Assoc. of Central Arizona

Cultural and Historic Resources

Stephen Glass, Gault Group

- Courtney Rose, Pima County
- JR Welch, Archaeology Southwest
- Laura Berglan, Pascua Yaqui Tribe
- Lee Decker, Gallagher & Kennedy (on behalf of Freeport McMoRan)
- Linda Mayro, Pima County
- Mark Horlings, Maricopa Audubon Society
- Mary-Ellen Walsh, State Historic Preservation Office
- Peter L. Steere, Tohono O'odham Nation
- Robert A. Linsell Jr., Granite Construction Company
- Ronald Maldonado, Westland Resources
- Susan B. Montgomery, Attorney, representing the Inter-Tribal Association of AZ

Endangered Species Act

Carrie Marr, USF&W

- Clayton Crowder, Arizona Game and Fish Department
- Heather Finden, City of Phoenix Water Services Division
- Jennifer Martin, Sierra Club - Grand Canyon Chapter
- Jenny Neeley, Pima County Office of Sustainability & Conservation
- Jill Himes, Himes Consulting, LLC
- Jim Tress, WestLand Resources
- Keith E. Knutson, Arizona Game and Fish Dept
- Kris Randall, US Fish and Wildlife Service
- Laura Stewart, ACS (Archaeological Consulting Services, Ltd.)
- Mark Horlings, Maricopa Audubon Society
- Matthew Camba, Wood
- Nancy Johannesmeyer, Asarco LLC
- Nichole Engelmann, U.S. Fish and Wildlife Service
- Rafael de Grenade, Hilgartwilson
- Robert Anderson, Fennemore Craig
- Russell Waldron, SWCA Environmental Consultants
- Terry Enk, Freeport-McMoRan

Fees

Jerry Worsham, Cavanagh Law Firm

- Adam Hawkins, Global External
- Amanda McGennis, Arizona Chapter Associated General Contractor
- Christopher "Kit" MacDonald, U.S. Forest Service - Coconino and Kaibab National Forests
- Duane Yantorno, Asarco
- Jeremy Browning, GovGroup
- Marcia Sorensen, City of Peoria
- Marina Estrella, City of Phoenix
- Mason Bolitho, Haley & Aldrich
- Rebecca Hudson-Nunez, Freeport McMoRan
- Sandy Bahr, Sierra Club

Jurisdictional Designation Process

Jack Moody, Slater Hanifan Group

- Adam Hawkins, Global External
- Betsi Phoebus, Jacobs Engineering Group Inc.
- Brian Lindenlaub, WestLand Resources, Inc.
- Dennis Krahn, El Dorado Holdings, LLC
- Jennifer Simpkins, Kimley-Horn
- Jessica Rybczynski, AZTEC Engineering
- Jill Himes, Himes Consulting, LLC
- Leigh Padgitt, City of Phoenix
- Linda Cheney, El Dorado Holdings,Inc.
- Marinela Papa-Konomi, Maricopa County Department of Transportation
- Mark Murphy, NV5, Inc.
- Michael Bryce, Graham County, Az
- Michael Cabrera, Pima County Regional Flood Control District
- Ned Hall, Freeport McMoRan
- Robert S. Lynch, Robert S. Lynch & Associates
- Roger E. McManus
- Scott Thomas, Fennemore Craig
- Sheila Logan, Hilgart Wilson
- Spencer Kamps, Home Builders Assoc. of Central Arizona
- Theresa Knoblock, Tierra Right of Way
- Tricia Gerrodette

Permit Process

Tricia Balluff, City of Phoenix

- Amanda McGennis, Arizona Chapter Associated General Contractor
- Betsi Phoebus, Jacobs Engineering Group Inc.
- David McIntyre, McIntyre Environmental
- Duane Yantorno, Asarco
- Emily Lester, ADOT
- James M. Stewart, ASARCO
- Jennifer Simpkins, Kimley-Horn
- Karla Reeve-Wise, Pima County DEQ
- Laura Stewart, ACS (Archaeological Consulting Services, Ltd.)
- Marc Wicke, Salt River Project
- Marinela Papa-Konomi, Maricopa County Department of Transportation
- Michael Cabrera, Pima County Regional Flood Control District
- Rion Bowers, Bowers Environmental Consulting, LLC
- Sandy Bahr, Sierra Club
- Scott Thomas, Fennemore Craig
- Sheila Logan, Hilgartwilson
- Susan B. Montgomery, Attorney, representing the Inter-Tribal Association of AZ
- Suzanne Shields, Pima County Regional Flood Control District
- Theresa Knoblock, Tierra Right of Way
- Tom Klimas, WestLand Resources

Significant Degradation, Alternative Analysis, Minimization

Jeremy Casteel, Hilgart Wilson

- Angela Garcia, Salt River Pima-Maricopa Indian Community
- Brian Lindenlaub, WestLand Resources, Inc.
- Bruce Larson, WestLand Resources
- Jennifer Martin, Sierra Club - Grand Canyon Chapter
- Karla Reeve-Wise, Pima County DEQ
- Lee Decker , Gallagher & Kennedy (on behalf of Freeport McMoRan)
- Monica Salguero, ASARCO
- Myron Smith, Carlota Copper Company
- Nancy Allen, City of Phoenix
- Rion Bowers, Bowers Environmental Consulting, LLC
- Robert E Kellock, USAF Retired
- Stanley R. Hart, Save the Scenic Santa Ritas (Board member)
- Van Wolf, Salmon Lewis & Weldon