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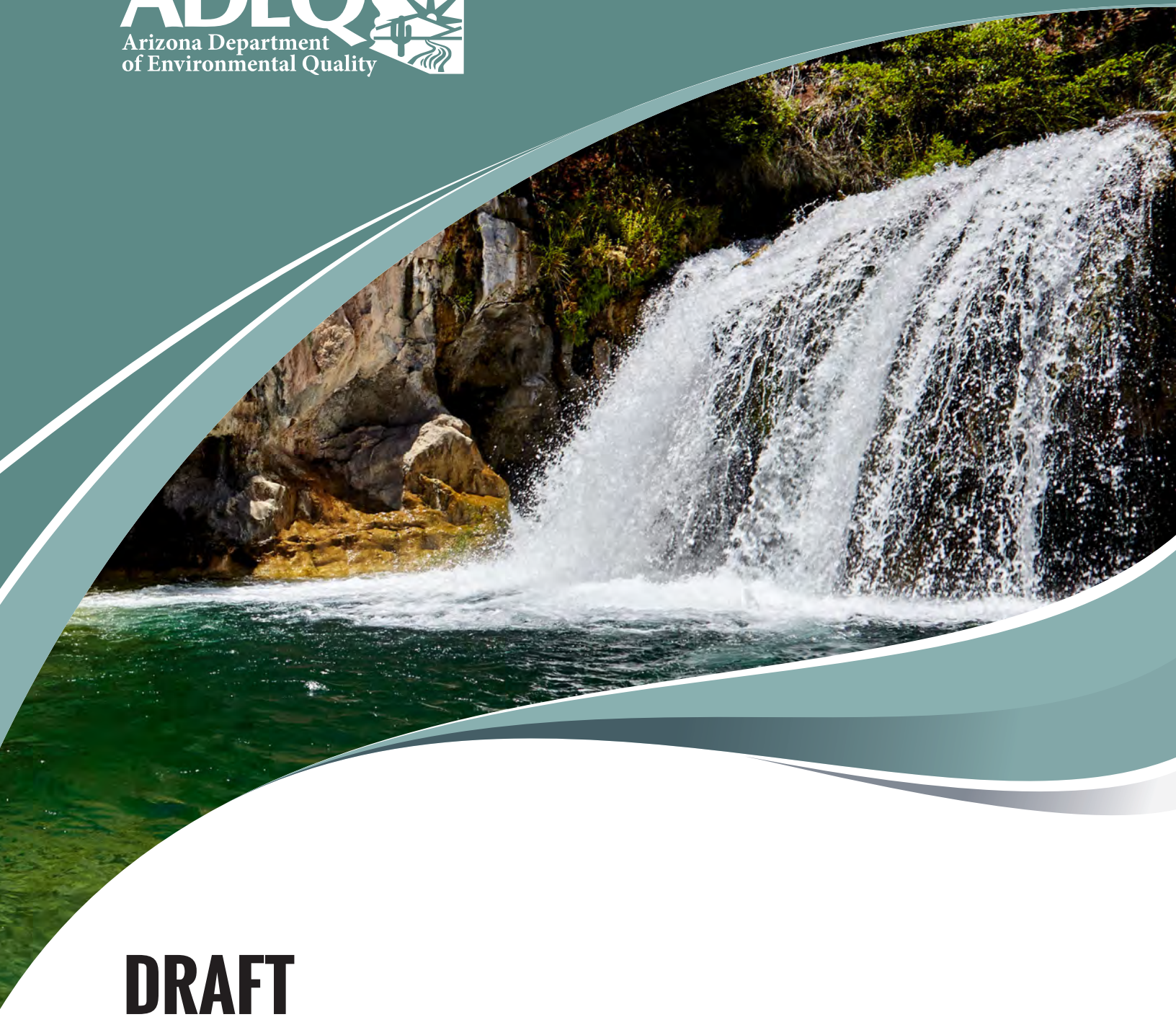
Arizona Department of Environmental Quality



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ADEQ Jurisdictional Evaluations - Focus on Significant Nexus

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

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List of Abbreviations

Abbreviation	Meaning
ADEQ	Arizona Department of Environmental Quality
AJD	Approved Jurisdictional Determination
APT	Antecedent Precipitation Tool
AZPDES	Arizona Pollutant Discharge Elimination System
CWA	Clean Water Act
HUC	Hydrologic Unit Code
NPDES	National Pollutant Discharge Elimination System
NPRM	Notice of Proposed Rulemaking
NWPR	Navigable Water Protection Rule
PJD	Preliminary Jurisdictional Determination
PSWL	Protected Surface Waters List
RPW	Relatively Permanent Water
SDAM	Streamflow Duration Assessment Methodology
SEM	Stream Ecosystem Monitoring
SWPP	Surface Water Protection Program
TNW	Traditionally Navigable Water
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
WBID	Waterbody Identification Number
WOTUS	Waters of the United States
WQS	Water Quality Standard

Purpose

This technical paper is the third in a series of five papers written by the Arizona Department of Environmental Quality (ADEQ) to support stakeholder engagement during the adoption of Arizona's State Surface Water Protection Program (SWPP). This paper is not policy. The SWPP technical papers are intended to be problem-solving artifacts to assist ADEQ in gathering information related to filing a Notice of Proposed Rulemaking (NPRM) for the SWPP. ADEQ believes that these papers will focus public engagement on the scientific basis for agency decisions and drive productive conversations regarding SWPP implementation.

To implement the SWPP, ADEQ needs to clearly delineate between Waters of the United States (WOTUS) regulated under the Clean Water Act (CWA) and non-WOTUS state protected surface waters regulated under the SWPP. ADEQ cannot regulate a surface water under both programs simultaneously so the agency must perform prospective jurisdictional evaluations of surface waters that will be listed on the Protected Surface Water List (PSWL).[1] Specifically, §49-221(G) requires ADEQ to publish a PSWL that delineates between "[a]ll WOTUS" and surface waters that will be protected as non-WOTUS.

This paper focuses on the significant nexus test, which is a weight of evidence approach for evaluating jurisdiction of some surface waters that is required by United States Environmental Protection Agency (USEPA). A history of CWA jurisdiction, including the need for a significant nexus test, can be found in the Introduction and Background section of this paper. In addition to this technical paper, ADEQ held a two day problem-solving event with both the USEPA and the United States Army Corps of Engineers (USACE) to address the process for jurisdictional evaluations and data presented below for significant nexus.

At a high level, this paper will address:

- The legal requirements to determine CWA and SWPP jurisdiction;
- Roles and responsibilities during the jurisdictional evaluation process;
- Types of data that can be used to conduct a significant nexus test for jurisdictional evaluations in Arizona.

ADEQ recognizes that at the publication date of this paper there are potential Federal rulemaking actions and litigation that may impact Arizona's implementation of CWA regulations.[2] The subject of this paper could vary dramatically based on the outcome of those federal

[1] Regulation under Arizona's SWPP and CWA programs largely take form through the process of assigning designated uses to waters. The SWPP and the CWA program will have separately defined designated uses. For further discussion, please see ADEQ's Arizona Water Quality Standards technical paper.

[2] *See Sackett v. Environmental Protection Agency* case and ongoing WOTUS rulemaking at 86 FR 69372. ADEQ has included this disclaimer on all SWPP technical papers, but it is most important for engaged parties to consider when reviewing the subject matter of this paper.

proceedings. ADEQ will continue to update stakeholders regarding any changes in Federal law that have an impact on adoption of the SWPP.

Introduction and Background

Arizona regulates surface waters such as lakes, ponds, streams and wetlands in partnership with the USEPA and USACE through implementation of the federal CWA. The regulatory programs mandated by the CWA include the regulation of discharges of pollutants to surface waters through the National Pollution Discharge Elimination System (NPDES) and regulation of the discharge of dredge and fill materials to surface waters by the USACE under § 404 of the CWA.

A surface water must be a WOTUS to fall under the jurisdiction of the CWA. Thus, the question "what surface waters are WOTUS?" is a vexing and oft-litigated national question that has historically determined which of Arizona's surface waters are regulated. The CWA does not define WOTUS. Instead, it provides discretion for the USEPA and the USACE to define WOTUS in their rules. The latest, finalized regulatory change to the WOTUS definition through a rulemaking action was announced on April 21, 2020, when the USEPA and USACE finalized the Navigable Waters Protection Rule (NWPR). The NWPR was in effect for approximately 16 months before being vacated. On August 30, 2021, Judge Márquez of the United States District Court for the District of Arizona issued an order finding that immediately returned the definition of WOTUS to the pre-2015 formulation.

As part of the SWPP rulemaking, ADEQ must publish a PSWL. HB2691 (2021) contained a legislative directive for ADEQ to list "All WOTUS"[3] on the PSWL. The return to the pre-2015 formulation of the WOTUS rule makes it necessary for ADEQ to revisit the Supreme Court decisions that address the definition of WOTUS in order to publish a final version of the PSWL as part of the rulemaking.

There are three Supreme Court cases that interpret the currently effective, pre-2015 version of the WOTUS rule. The holdings from these three cases have also been distilled into the WOTUS definition that is currently being proposed by the USEPA in Docket ID No. EPA–HQ–OW–2021–0602.[4]

In 1985, in *United States v. Riverside Bayview Homes, Inc.*, the U.S. Supreme Court deferred to the USACE's assertion of jurisdiction over wetlands adjacent to a traditionally navigable water (TNW), stating that adjacent wetlands may be regulated as WOTUS because they are ''inseparably bound up'' with navigable waters and ''in the majority of cases'' have ''significant effects on water quality and the aquatic ecosystem'' in those waters.

[3] 2021 Laws Ch. 325 § 7.
[4] https://www.regulations.gov/document/EPA-HQ-OW-2021-0602-0001

In *Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers* (SWANCC) in 2001, the Court rejected a claim of federal jurisdiction over non-navigable, isolated, intrastate ponds that lack a sufficient connection to TNWs, noting that the term ''navigable'' must be given meaning within the context and application of the statute. The Court held that the use of "isolated" non-navigable intrastate ponds by migratory birds was not by itself a sufficient basis for the exercise of federal regulatory authority under the CWA. In 2001 and again in 2003, the agencies developed guidance to address the definition of "waters of the United States" under the CWA following the SWANCC decision.

The Court most recently interpreted the term WOTUS in *Rapanos v. United States*[5] in 2006. A four-Justice plurality stated that ''waters of the United States'' ''include[ ] only those relatively permanent, standing or continuously flowing bodies of water 'forming geographic features' that are described in ordinary parlance as 'streams[,] . . . oceans, rivers, [and] lakes,'" and ''wetlands with a continuous surface connection'' to a ''relatively permanent body of water connected to traditional interstate navigable waters.'' In a concurring opinion, Justice Kennedy took a different approach, concluding that ''to constitute 'navigable waters' under the Act, a water or wetland must possess a 'significant nexus' to waters that are or were navigable in fact or that could reasonably be so made.'' Justice Kennedy found that the wetland in question would be considered a WOTUS under the CWA "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.'"[6] Further, Kennedy found that a wetland does not need a "continuous surface connection to other jurisdictional waters" to be a WOTUS.[7] The limitation on the Kennedy test is that the CWA does not protect a wetland where its "effect on water quality [is] speculative or insubstantial."[8] While the case was focused on wetlands, Kennedy noted that under the significant nexus test, a WOTUS can include impermanent streams - rejecting the notion that a WOTUS requires "permanent standing water" or "continuous flow".[9]

Following the *Rapanos* decision, the EPA provided guidance on a "fact-specific analysis" to determine whether non-navigable tributaries that are not relatively permanent have a significant nexus with a TNW.[10] The analysis must 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."[11] This guidance also includes identification of a relatively permanent water (RPW) as a water that flows year-round or reliably flows during a season, such as during spring snowmelt.

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[5] *Rapanos v. United States,* 547 U.S. 715.
[6] *Id*. at 780.
[7] *Id*. at 772.
[8] *Id*. at 780.
[9] *See id*. at 769–70.
[10] *Clean Water Act Jurisdiction Following the U.S. Supreme Court's Decision in Rapanos v. United States & Carabell v. United States* (2008).
[11] *Id.* at 8.

The guidance instructs the agency to consider hydrologic factors including:

1. Volume, duration, and frequency of flow;
2. Proximity to the traditional navigable water;
3. Size of the watershed;
4. Average annual rainfall; and
5. Average annual winter snowpack.[12]

And ecological factors including the:

1. Potential of tributaries to carry pollutants and flood waters to traditional navigable waters;
2. Provision of aquatic habitat that supports a traditional navigable water;
3. Potential of wetlands to trap and filter pollutants or store flood waters; and
4. Maintenance of water quality in traditional navigable waters.[13]

In the guidance document, the USEPA expressly states that ephemeral features can have a significant nexus to downstream TNWs.[14] This point is incredibly pertinent in the arid Southwest. The USEPA explains that, following a rain event, ephemeral features can "collect and transport water and sometimes sediment from upper reaches of the landscape downstream to the traditional navigable waters."[15] The USEPA further states that these ephemeral features can "provide habitat for wildlife and aquatic organisms in downstream traditional navigable waters." Further, these features can "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."[16]

Roles and Responsibilities of State and Federal Agencies

Making jurisdictional evaluations is vital to ADEQ because the USEPA has authorized ADEQ to implement the permitting program under CWA § 402. ADEQ has the authority, with USEPA oversight, to conduct jurisdictional evaluations of all Arizona waters not on tribal land. These evaluations are water specific and do not expire; however, additional data and information may be reviewed that could support or change a decision.

[12] *Id.*
[13] *Id.*
[14] *Id*. at 12.
[15] *Id*.
[16] *Id*.

Specifically under the CWA and State implementation statutes, ADEQ has the authority to set Water Quality Standards (WQSs) for WOTUS.[17] The establishment of any WQS under A.R.S. 49-221(A) necessarily requires ADEQ to evaluate whether a water is a WOTUS. In order to set such a WQS, ADEQ must proceed through the statutorily defined rulemaking process. In addition to WQSs, the CWA and State implementation statutes for the NPDES[18] authorize ADEQ to issue permits for and bring enforcement actions against unpermitted point source discharges to WOTUS.[19] Any permitting or enforcement action ADEQ launches under this authority necessarily requires an evaluation establishing that the impacted water is a WOTUS. Permit issuance must follow explicit procedures, including appeals, established in statute and rule. A WQS or NPDES permit must be subject to USEPA review prior to becoming enforceable, and therefore, the USEPA has final authority to determine whether a WQS or NPDES permit was appropriately issued in accordance with law. This review necessarily includes a review of the jurisdictional aspects of the WQS or NPDES permit, which includes the receiving waters status as a WOTUS.

The USACE, with USEPA input, evaluates waters for jurisdictional status under CWA § 404[20] for the purpose of regulating certain types of dredge and fill activities in WOTUS. In Arizona, these evaluations are mostly project specific and expire after 5 years. While the USEPA, U.S Fish and Wildlife Service, National Marine Fisheries Service and states have a role in CWA § 404, it is the USACE that issues the permits. Some 404 permits may identify a water as a TNW, which are specific to the project identified in the permit. The USACE also issues TNW determinations that are completed independently of any project-specific permit request, known as stand-alone TNWs. A stand-alone TNW determination is conducted for a specific reach of a river, stream or other type of surface water and is performed independently of any singular project. A stand-alone TNW determination does not expire.

While there is overlap between the jurisdictional evaluations conducted for the purposes of CWA § 404 and § 402, a jurisdictional decision for one may not apply to the other. For example, if the USACE determines a 404 permit is not needed for a limited project area that is outside but adjacent to a water, that decision may not influence the jurisdictional status of the water itself as a WOTUS. And, while ADEQ does not have specific authority to issue enforceable, independent, jurisdictional determinations as the USACE does under the CWA dredge and fill program, ADEQ must investigate and evaluate various waters' jurisdictional status in order to execute its CWA functions in setting WQS, identifying impaired waters, as well as issuing permits and bringing enforcement actions under the NPDES program.[21]

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[17] 33 U.S.C. 1312(a), A.R.S. 49-221(A)
[18] In Arizona, ADEQ has primacy over this program and it is known as the Arizona Pollution Discharge Elimination System or AZPDES.
[19] 33 U.S.C. 1342; A.R.S. 49-255 et. seq.
[20] Permit Program under CWA Section 404 | USEPA
[21] 33 U.S.C. 1344.

ADEQ's Jurisdictional Evaluation Partnerships

ADEQ has taken concrete steps to solidify the partnership between ADEQ, USEPA and USACE to ensure that our jurisdictional evaluation process meets the requirements of our Federal partners. ADEQ planned a two day kaizen event on February 22 and 23, 2022, during which the agency reviewed the process outlined in this paper with representatives from USEPA Region 9 and USACE Arizona-Nevada Area Office. The alignment achieved between all three co-regulators increases the probability that modifications made to Title 18, Chapter 11, Article 1, Appendix B are approved during the SWPP rulemaking. Proposed modifications will remove non-WOTUS waters from Appendix B. Some non-WOTUS waters may be protected under SWPP.

To further assist in the jurisdictional evaluation process, ADEQ retained Tetra Tech, a well known international consulting and engineering firm, to produce an "Arizona Handbook for Jurisdictional Evaluations" that will leverage the existing USEPA and USACE guidance. This handbook will go into further detail on the process that ADEQ uses to perform jurisdictional evaluations in the state. A draft is due to ADEQ by June 30, 2022.

ADEQ's Jurisdictional Analysis

ADEQ has established an evaluation process by which to determine the CWA jurisdictional status of Arizona surface waters.[22] Through this process, ADEQ identifies surface waters that may need to be further analyzed to determine if they have a significant nexus to a downstream TNW. A significant nexus analysis is an assessment of the flow characteristics and functions of a tributary, alone or in combination with any adjacent wetlands, to determine if it has more than an insubstantial or speculative effect on the chemical, physical, and/or biological integrity of a TNW. ADEQ will conduct the analysis by incorporating multiple datasets in a weight of evidence approach as indicated in the list below. In developing this list, ADEQ reviewed the USEPA/USACE guidance to account for chemical, physical, and biological properties that should be considered in making a weight of evidence argument that a surface water has a significant nexus to a TNW and therefore should be considered a WOTUS.

The process that ADEQ uses to conduct jurisdictional evaluations begins by dividing surface waters into unique segments, known individually as a reach. A reach is a section of a stream or river along which similar hydrologic conditions exist.[23] ADEQ assigns each surface water reach, lake, pond or other type of surface water an identification number known as a Waterbody Identification Number or WBID. These WBIDs are subunits of the U.S. Geological Survey (USGS) hydrologic unit code (HUC), which classify waters based on regions and watersheds.[24]

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[22] *See* Appendix A for the steps in ADEQ's general jurisdictional evaluation process. Not all waters need a significant nexus evaluation.
[23] USGS page on "What is a reach?"
[24] Hydrologic Unit Maps

A water can be composed of numerous WBIDs. For example, the Colorado River comprises more than two dozen WBIDs between Lake Powell and the international border.

404 Jurisdictional Determinations

While jurisdictional determinations for the purposes of CWA § 404 completed by the USACE do not specifically designate jurisdictional status for purposes of CWA § 402, ADEQ recognizes that this data should be incorporated into ADEQ significant nexus evaluations as another indicator of jurisdiction. ADEQ uses previous USACE Approved Jurisdictional Determinations (AJDs) and Preliminary Jurisdictional Determinations (PJDs) as a data point in jurisdictional evaluations. ADEQ will also consider cases when the USEPA and USACE were not aligned on a determination.

The USACE is the only agency that can designate a water as a TNW.[25] In Arizona, the entirety of the Colorado River is a TNW; along with segments of the Gila, Santa Cruz and Virgin rivers and lakes Alamo, Mead, Powell, Pleasant and Roosevelt.[26] While most of these are stand-alone TNW designations and are unrelated to a specific project, some were designated a TNW for a specific project-level AJD.[27] These project specific TNWs are segments of the Virgin River and Gila River, as well as Alamo Lake, Lake Pleasant and Roosevelt Lake. While some AJDs for project specific TNWs may be beyond the 5-year time frame, ADEQ recognizes the historic nature of these documents and, as hydrological conditions have not significantly changed since issuance, will retain the USACE decision.

Physical Characterization

Physical characteristics of the WBID are important factors in identifying a nexus with downstream waters and lay the foundation upon which to conduct a significant nexus test. These factors include the following:

- WBID length or acreage in the case of a lake or pond;
- Stream miles to the nearest TNW;
- Watershed size or contributing drainage area;
- Length of tributary that is of the same stream order in relation to an RPW or TNW;
- Threatened and endangered species habitat present;
- Presence of manmade features, such as impoundments, roads, agricultural fields, dams, structures, etc.;
- Geomorphology of the area;

[25] *See,* 33 U.S.C. § 331.2
[26] Los Angeles District > Missions > Regulatory > Jurisdictional Determination > Navigable Waterways
[27] NOTE - ADEQ recently received a GIS file from USACE that indicates every project level jurisdictional determination and stand-alone TNW determination made in Arizona. ADEQ is migrating the data to our own mapping system and will provide it to stakeholders during this process. This section may be updated significantly with new information.

- Presence of a channel with bed, bank and ordinary high water mark indicators; and
- Meets tributary definition in USEPA/USACE guidance.

Climate and Normal Conditions

When water flows it can transport nutrients, sediments, or pollutants that impact the chemical, physical, and biological properties of downstream RPWs and TNWs. For this reason, understanding precipitation conditions in the area surrounding a surface water can be an important factor in evaluating a surface water's capacity to impact downstream waters. The USEPA/USACE guidance for determining if a significant nexus exists directs ADEQ to evaluate climate conditions that occur in a "typical year." A surface water in an area with a wetter climate is more likely to produce the volume, duration, and frequency of flow that is necessary to impact downstream TNWs.

The state of Arizona can be divided into seven USEPA Level III ecoregions[28] that have varying climates. Normal conditions in one ecoregion may differ greatly from another. For example, the Sonoran Basin and Range is drier, hotter, and commonly dotted with ephemeral drainages. The Arizona/New Mexico Mountains region is wetter, cooler, and home to many perennial streams. The general conditions in the Arizona/New Mexico Mountains region make it more likely that a surface water in that area will flow at the rate required to impact a downstream TNW.

The USACE developed an Antecedent Precipitation Tool (APT)[29] to evaluate climatic conditions and quantify the factors that can influence flow in a water body. The APT can be used to determine if observed flow falls within normal climatic conditions by using precipitation data from the three prior months. ADEQ uses the APT as an indicator of whether flow evidence in a WBID represents normal conditions.

ADEQ uses the data mentioned above to add context to other data points generated during the significant nexus analysis. ADEQ uses USGS research that defines a breakpoint between ephemeral and intermittent flow regimes as a percent of zero-flow days[30] to further construct the flow characteristics of a surface. The flow characteristics established by these breakpoints assist in identifying the likelihood of non-seasonal flow (i.e. ephemeral flow) under normal conditions that could transport pollutants, sediment, and nutrients downstream. An example of this would be a surface water that reliably flows during the summer monsoon.

It is important to note that the climate can shift due to external influences. As the process for evaluating waters for WOTUS and non-WOTUS status continues to evolve, ADEQ may need to incorporate new data, science, and legal interpretations in the agency's analysis.

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[28] Level III and IV Ecoregions of the Continental United States | USEPA
[29] The Antecedent Precipitation Tool (APT) | USEPA
[30] *See* ADEQ White Paper White Paper - *Application of flow gauge data utilizing a USGS approach to identify ephemeral and intermittent flow regimes in Arizona* https://static.azdeq.gov/wqd/swp/flow_gauge_thresholds.pdf

Field Surveys

ADEQ begins a jurisdictional evaluation using GIS desktop tools and readily available datasets as previously described. However, sometimes additional clarity and a final determination may only be obtained through a field visit. A good example of data that may need to be verified through a field visit is the data generated by the Riparian Vegetation Tool.[31] The Tool may identify a partial riparian corridor in a non-RPW, which can indicate a reliable presence of water in the channel. A field survey clarifies if elements that could support downstream habitat or aquatic or wildlife species in an RPW or TNW are present. ADEQ deploys a number of different types of field surveys to verify our desktop analysis. During a field survey, ADEQ collects data on:

1. Species of macroinvertebrates, amphibians, fish, or other fauna;
2. Species of aquatic and riparian plants,
3. Sediment size and distribution (ie. percent fine sediment),
4. Other relevant biological data,
5. Water chemistry samples (eg. nutrients, metals, TDS)
6. Geomorphological data

More specifically, a Stream Ecosystem Monitoring (SEM) field survey gathers data about the macroinvertebrates present in and around a surface water, the level of fine sediment in the water, and identifies both aquatic and riparian vegetation that is supported by the surface water. ADEQ will also gather water quality samples during a SEM survey. A geomorphologic survey gathers information regarding sediment movement to downstream waters (eg. relative bed stability, longitudinal surveys).

ADEQ uses this information to create the most accurate picture possible of whether or not characteristics of the surface water show that the water significantly affects the chemical, physical, and biological integrity of downstream RPWs and TNWs. For example, macroinvertebrates in one part of the water could become a food source for downstream aquatic species during or after a flow event and nutrients in upstream waters could contribute to algal blooms in downstream waters.

ADEQ also conducts Streamflow Duration Assessment Methodology (SDAM) field surveys following the guidance released by the USEPA.[32] SDAMs are rapid field assessments which include a one-day visit to a site for observation of hydrological, geomorphological, and biological indicators to determine the flow regime for a WBID. ADEQ is at the leading edge of building this "boots on the ground" approach, and the agency contributed data to the development of the Arid West SDAM that the EPA is deploying. While SDAMs are intended to make assessments on flow regime in cases where flow regime is not definitively identified, ADEQ believes elements of data can be utilized similar to that of SEM to indicate that a surface waters has the potential to support the habitat of aquatic or wildlife species in a downstream RPW or TNW.

[31] https://static.azdeq.gov/wqd/swp/riparian_vegetation_tool.pdf
[32] Beta Streamflow Duration Assessment Method for the Arid West | USEPA

Biological and Ecological Factors

One of the noteworthy elements of Justice Kennedy's concurrence in *Rapanos* is his reference to "other relevant considerations"[33] that could influence jurisdictional determinations. ADEQ has not developed specific measurements for these "other relevant considerations," but is exploring potential biological or ecological markers that could be used to assist in making a weight of the evidence determination for jurisdictional status. The agency welcomes any comment on data that ADEQ should consider when making jurisdictional determinations.

ADEQ-Specific Tools

To assist with jurisdictional evaluations under the now-vacated NWPR, ADEQ developed three tools by which to estimate hydrologic conditions for a water: the Riparian Vegetation Tool, Groundwater Tool, and Snowpack Tool.[34] The NWPR relied heavily on using the flow characteristics of a surface water to determine if that water would be considered a WOTUS. While flow regime is not a dispositive factor in determining if a surface water has a significant nexus text to a TNW, the data generated by analyzing flow regime helps ADEQ determine if a surface water has the potential to affect the chemical, physical, and biological integrity of downstream TNWs.

Following a thorough review of peer-reviewed research and an analysis of readily available data specific to Arizona, ADEQ established a methodology for each of these tools to estimate intermittent or ephemeral flow in a surface water. While these tools do not assign a definitive flow regime, the tools provide a sound estimate of the likelihood of flow where other data are not available. On waters with undefined flow regimes, the tools can add to the weight of evidence approach for significant nexus to indicate the probability of flow, or lack thereof.

ADEQ is also incorporating long-term USGS flow gauge data in the process of assigning flow regimes.[35] ADEQ is also considering how to utilize this methodology with other data sources, such as county flood gauges, field camera imagery, in-situ sensors, remote sensing, etc.

Future Research

ADEQ will consider any relevant peer-reviewed published research to help flesh out additional data points that will lead to better determinations of whether a surface water has a significant

[33] In his *Rapanos* concurrence, Justice Kennedy noted that the Corps may choose, by rule or adjudication, "to identify categories of tributaries that, due to their volume of flow (either annually or on average). Their proximity to navigable waters, or *other relevant considerations* are significant enough that wetlands adjacent to them are likely in the majority of cases to perform important functions for an aquatic system incorporating navigable waters." 547 U.S. 781.

[34] *See* ADEQ White Papers for these tools at the bottom of http://azdeq.gov/flowregimes (Note this is placeholder in this draft as the papers are not yet online. *We can provide those upon request until they are posted.*

[35] Application of Flow Gauge Data

nexus to a downstream TNW. This research could include science originating from ADEQ partnerships with federal or state agency and university partners. ADEQ recently funded a study conducted by Arizona State University to develop a methodology utilizing Earth-observing satellite data to detect flowing water in arid land rivers. Funding to expand this research is now being provided by NASA.[36] ADEQ is continuing to review the results of this work for potential application.

Conclusion

The adoption of the SWPP necessitates that ADEQ provide much-needed clarity to jurisdictional decisions to ensure that waters are properly being protected under the CWA as WOTUS protected surface waters or under the SWPP as non-WOTUS protected surface waters. Building a cogent process for performing these evaluations will go a long way in delivering on the ultimate promise of the SWPP - consistency and clarity regarding what waters are regulated in Arizona. A significant nexus test is an important assessment of hydrological, biological, chemical and climate characteristics in a non-RPW tributary to determine if it has more than an insubstantial or speculative effect on the chemical, physical, and/or biological integrity of a downstream TNW. The process outlined in this paper constitutes an initial approach based on existing guidance, ADEQ tools and resources, and significant nexus evaluations in scientific literature. This weight of evidence approach will become more refined with additional review, experience and input from Federal partners and Arizona stakeholders.

If you have comments or questions on this white paper or suggestions for additional sources of data for our jurisdictional evaluations, please reach out to ADEQ at:

Dr. David Lelsz, Ph.D. - lelsz.david@azdeq.gov

[36] ASU scientists use commercial satellite data to determine water flow in Southwestern rivers

Appendix A: ADEQ's Jurisdictional Evaluation Process

The body of this technical paper focuses on a small, but integral, portion of ADEQ's jurisdictional evaluation process. The significant nexus test is not a determinative jurisdictional test for every surface water in Arizona. This appendix addresses ADEQ's general jurisdictional evaluation process before a significant nexus test is needed. At a high-level, ADEQ's jurisdictional evaluation process consists of:

1. An evaluation of connectivity;
2. Consideration of historical regulatory decisions;
3. An evaluation to determine if a water is an RPW;
4. A flow regime analysis that takes seasonality into account; and
5. A significant nexus test.

The process that ADEQ uses to conduct jurisdictional evaluations begins by dividing surface waters into unique segments, known individually as a reach. A reach is a section of a stream or river along which similar hydrologic conditions exist.[37] ADEQ assigns each surface water reach, lake, pond or other type of surface water an identification number known as a Waterbody Identification Number or WBID. These WBIDs are subunits of the U.S. Geological Survey (USGS) hydrologic unit code (HUC), which classify waters based on regions and watersheds.[38] A water can be composed of numerous WBIDs. For example, the Colorado River comprises more than two dozen WBIDs between Lake Powell and the international border.

Each WBID is assigned a flow regime classification of perennial, intermittent, ephemeral, undetermined or null. RPWs have either a perennial or intermittent flow regime; whereas non-RPWs are designated ephemeral. WBIDs with insufficient data to determine flow are classified as "undetermined". If there is no flow data for the WBID, it is classified as "null". A description of flow regimes and further discussion of how ADEQ assigns a flow regime to a WBID can be found at azdeq.gov/flowregimes.

ADEQ evaluates each of these WBIDs for jurisdictional status to align with current USEPA guidance.[39] Based on the flow regime assigned, ADEQ classifies each WBID in one of four categories as follows:

- WOTUS, which includes TNWs and RPWs confirmed to connect to a TNW;
- Non-WOTUS, which includes waters with confirmation of no connectivity to a TNW and on which USEPA has no objections to these findings;

[37] USGS page on "What is a reach?"
[38] Hydrologic Unit Maps
[39] Waters of the United States | USEPA

- Historic WOTUS, which are WBIDs that comprise waters listed in Arizona Administrative Code Title 18, Chapter 11, Appendix B (R18-11 Appendix B) that have been historically regulated as WOTUS through a public process under the pre-2015 regulatory regime, but that need additional data to confirm ADEQ's previous analysis that the WBID is an RPW and/or if there is significant nexus to a TNW; and
- Inconclusive, which are waters not on R18-11 Appendix B and that need additional data to determine, with confidence, if the WBID is an RPW and/or if there is significant nexus to a TNW.

Waters listed in R18-11 Appendix B can be composed of numerous WBIDs. ADEQ is performing ongoing evaluations of surface waters and updating flow regimes to regulated waters. This process is continuous and ADEQ uses the most recent data and information possible in the evaluations. As data is collected and/or reviewed, some flow regime modifications may result in a change in jurisdictional status. The jurisdictional status of Arizona waters is not static and can change with future rule updates, guidance, legal interpretations, additional credible data, and advancements in science and technology.

ADEQ's current jurisdictional evaluation process begins with a "desktop" based screening process. The agency analyzes potential connectivity to a TNW utilizing the Flow Path (Raindrop) Tool developed by the USGS in their StreamStats application.[40] ADEQ observes any connectivity over multiple WBIDs that form the flowpath to a TNW. If the Tool indicates connectivity for the entire flowpath, ADEQ analyzes other information, including, but not limited to, aerial imagery for channel features, topographic imagery, and floodplain data to verify connectivity. If connectivity is confirmed and the WBID is identified as an RPW, the water is a WOTUS.

If the Tool shows no connectivity, ADEQ will analyze additional information, such as that previously listed, to confirm there is no connectivity. If no connectivity is confirmed, the jurisdictional status of the water is reviewed with the USEPA. ADEQ will consider USEPA comments received during the review and classify the water as non-WOTUS. A non-WOTUS water will then be evaluated for protection under SWPP. If a non-WOTUS water is listed on R18-11 Appendix B, ADEQ will propose to remove it through rulemaking.

If ADEQ cannot make a final determination during the desktop process because connectivity or the lack thereof is not confirmed, ADEQ retains the existing jurisdictional evaluation until additional data can be gathered and analysis conducted. ADEQ is actively developing processes and in consultation the USEPA and USACE to add clarity to what data and analysis is needed to:

- Confirm seasonality when a WBID is assigned an intermittent flow regime to evaluate whether it is an RPW; or

[40] StreamStats: Streamflow Statistics and Spatial Analysis Tools for Water-Resources Applications | US Geological Survey

- Conduct a significant nexus test when a WBID is assigned an ephemeral flow regime or intermittent flow regime for which seasonal flow could not be confirmed.
- Estimate flow regime for WBIDs assigned “null” or “undetermined” to determine if a significant nexus test is needed.

Seasonality Factor

USEPA/USACE guidance indicates confirmation of seasonality is needed for any waters identified as having an intermittent flow regime as a RPW. If seasonal intermittent flow is confirmed and the waterbody has connectivity to a TNW, then the water is considered an RPW and is a WOTUS. ADEQ is exploring how to utilize existing data and information to confirm seasonal intermittent flow, including, but not limited to:

1. Hydrograph analysis of USGS gauge data;
2. Seasonal records of flow, such as water quality samples, game camera imagery or other flow records;
3. Satellite imagery spanning multiple years; and
4. Field surveys, such as SDAM, macroinvertebrate, algae, fish or riparian vegetation surveys.

While confirmation of seasonal intermittent flow is a separate process from a significant nexus test, the process for confirmation may incorporate some of the elements utilized to determine significant nexus.