

Comments of the Waters Advocacy Coalition (WAC)  
on the U.S. Environmental Protection Agency's and U.S. Army Corps of Engineers' Proposed  
Revised Definition of "Waters of the United States"

Docket No. EPA-HQ-OW-2021-0602

February 7, 2022

**Exhibit 8:**  
**Lucy Harrington, Robert Gensemer, Jeniffer Lynch, GEI Consultants, "Technical  
Comments on Proposed Revised Definition of Waters of the United States" (Feb. 4, 2022)**



Consulting  
Engineers and  
Scientists

February 4, 2022

Waters Advocacy Coalition  
Via email: CourtneyB@fb.org

**Re: Technical Comments on the Revised Definition of Waters of the United States,  
Proposed Rule (Proposed Rule)**

Dear Ms. Briggs:

Per your request, GEI Consultants, Inc. (GEI) is transmitting our technical comments to the Waters Advocacy Coalition (WAC) on the Proposed Rule. These technical comments broadly address the ability of the Proposed Rule to address previous concerns raised by WAC regarding the 2015 Waters of the United States Rule, the ability to consistently and reliably apply the Proposed Rule (particularly in regard to the significant nexus test to ephemeral features and other waters), and practical policy implications associated with on-the-ground implementation of the Proposed Rule. To develop these comments, we reviewed the *Technical Support Document for the Proposed "Revised Definition of the "Waters of the United States" Rule* (TSD), the *Scientific Advisory Board Review of the Draft EPA Report Connectivity of Streams and Wetlands to Downstream Waters: A Review and Synthesis of the Scientific Evidence* (SAB Review), and the *Connectivity of Streams and Wetlands to Downstream Waters: A Review and Synthesis of the Scientific Evidence* (Science Report).

We appreciate our continued relationship and work with your organization. If you have any questions regarding our submittal, please contact me at 720-955-3029 or lharrington@geiconsultants.com.

Sincerely,

GEI CONSULTANTS, INC.

A handwritten signature in blue ink that reads "Lucy Harrington".

Lucy Harrington  
Project Manager

A handwritten signature in black ink that reads "Robert W. Gensemer".

Robert W. Gensemer, Ph.D.  
Vice President

## Technical Memo

**To:** Waters Advocacy Coalition (WAC)  
**CC:** Courtney Briggs, American Farm Bureau Federation  
**From:** Lucy Harrington, Robert Gensemer, Jeniffer Lynch  
**Date:** 2/4/2022  
**Re:** Technical Comments on Proposed Revised Definition of Waters of the United States  
GEI Project No. 2200022

WAC Members:

Thank you for the opportunity to provide comment on the scientific support for the *Revised Definition of Waters of the United States Proposed Rule* (Proposed Rule). In response to your request for insights regarding the Proposed Rule’s technical underpinnings, definitions of key terminology, and possible implementation, GEI has performed a thorough investigation of the Proposed Rule, the *Technical Support Document for the Proposed “Revised Definition of the “Waters of the United States” Rule* (TSD), the *Scientific Advisory Board Review of the Draft EPA Report Connectivity of Streams and Wetlands to Downstream Waters: A Review and Synthesis of the Scientific Evidence* (SAB Review), and the *Connectivity of Streams and Wetlands to Downstream Waters: A Review and Synthesis of the Scientific Evidence* (Science Report).

Based on our review of these documents, two global trends appear. First, regulatory sideboards are not clearly defined; that is to say, it appears that the argument could be made that any aquatic feature, regardless of surface or sub-surface connection, inundation period, or position on the landscape could be considered to have a significant nexus to a traditional navigable water. However, the converse of this argument would be much more challenging to identify, putting the burden of proof on the regulated public to disprove federal jurisdiction. This indicates an inherent bias toward regulatory authority. Second, there is uncertainty throughout the documents as to the appropriate scale to use when defining regulatory authority. At various points, the documents consider a variety of scales for time (related to hydrology cycles) and geography (including broad regions of the U.S., ecoregions, watersheds, and individual wetlands) when considering the interconnectivity of wetlands, aggregate wetland impacts, inundation periods, and climate change. This uncertainty of scale will likely result in confusion within the regulated public and within the Agencies themselves as anything may be determined to be significant if viewed from a person’s desired scale. In combination, these two global trends present obstacles

to implementing a clear, consistent, and replicable policy and may lead to significant nexus determinations deemed to have speculative and insubstantial effects on the physical, chemical, or biological integrity of traditional navigable waters. Specific examples of these global observations and additional comments are presented below in the following findings.

### **I. Interplay Between the Current Proposal and the Science Report**

Throughout the Proposed Rule and the associated TSD, the Agencies clearly relied extensively on the Science Report. In Section II.A and II.B of the TSD, they present a detailed summary of the main conclusions from the Science Report, including peer review of this report by the Science Advisory Board (SAB).

The Agencies then conducted an extensive review of the scientific literature published since 2014 (Section II.C) to determine whether or not new studies either supported or refuted the Science Report's conclusions, or whether the new studies were inconclusive (i.e., neither supported nor refuted the Science Report findings). The charge questions for the subject matter experts reviewing the scientific literature were the same as those used in the Science Report, namely:

- What are the physical, chemical, and biological connections to, and effects of, ephemeral, intermittent, and perennial streams on downstream waters (e.g., rivers, lakes, reservoirs, estuaries)?
- What are the physical, chemical, and biological connections to, and effects of, riparian or floodplain wetlands and open waters (e.g., riverine wetlands, oxbow lakes) on downstream waters?
- What are the physical, chemical, and biological connections to, and effects of, wetlands and open waters in non-floodplain settings (e.g., most prairie potholes, vernal pools) on downstream waters?

The literature review consisted of screening the titles and abstracts of 17,044 peer-reviewed scientific papers using the software program SWIFT-Active Screener. From these, the Office of Research and Development's (ORD) subject matter experts screened the abstracts of 12,659 papers to determine if they supported or refuted the Science Report findings. Ultimately, 2,022 unique papers were determined to be directly relevant for review and categorization according to the charge questions. Based on the literature screened from these unique papers, the following findings were made:

- For ephemeral, intermittent and/or perennial streams, 98% of abstracts were found to support the primary conclusions of the Science Report, with only one paper refuting these conclusions.
- For floodplain wetlands and open waters, 95% of abstracts were found to support the Science Report conclusions, with 5% being inconclusive or refuting.

- For non-floodplain wetlands and open waters, 97% of abstracts were found to support the Science Report conclusions, with 3% being inconclusive or refuting.

Many of the truly “updated” findings discussed in the TSD related to non-floodplain wetlands and open waters. For these, the Agencies concluded that a significant amount of new information was available supporting the significance of connections between non-floodplain features and downstream Traditional Navigable Waters (TNWs). The key ecological effects they focused on in this respect were:

- Nitrogen cycle geochemistry (e.g., denitrification) to minimize downgradient nutrient enrichment
- Flood control, water scarcity (e.g., groundwater recharge) and resilience linked to climate change
- Maintaining cooler downstream water temperatures for cool and cold-water fish.

Of particular importance for non-floodplain wetlands and open waters was the concept that the level or gradient of connectivity was of limited concern, with even the most “disconnected” waters (in terms of distance and/or surface connectivity) determined to significantly support the integrity of downstream waters. Indeed, “disconnection” by itself was shown in several of the cited papers to be of significant positive value to downstream river systems as watersheds cycle through periods of relative connection (wet periods) vs. periods of relative disconnection (dry periods).

It should be noted that these conclusions were based solely on review of the abstracts of the papers. In Section II.C.v of the TSD, the Agencies acknowledge that such a review based only on abstracts represents some uncertainty in their findings. However, the Agencies went on to dismiss any impact of this uncertainty on their overall finding of significant support for the Science Report’s conclusions. Specifically, on page 87 of the TSD, the document states, “A complete read of each paper would likely obviate many uncertainties but was beyond the scope of this review. However, given that the scientific papers published  $\geq 2014$  and reviewed by the team provided overwhelming support substantiating the findings and conclusions of the Science Report, the limitations of the approach are unlikely to affect the main findings reported here.”<sup>1</sup>

---

<sup>1</sup> Because the Agencies’ logic in this statement appears to be circular, it may be of value to stakeholders to independently evaluate the inherent uncertainty of limiting review to abstracts, but a review of full papers was outside the scope of GEI’s review.

## II. The Agencies Have Yet to Clearly Define “Significance” or Provide Metrics for Quantifying Significance.

### A. The “significant nexus” definition is unclear.

The Proposed Rule and Section IV.E.iv of the TSD defines “significantly affect” for the purpose of determining whether a significant nexus exists as “more than speculative and insubstantial effects on the physical, chemical, or biological integrity of a traditional navigable water, interstate water or the territorial seas.” This terminology was included in Justice Kennedy’s opinion in the *Rapanos* guidance and was utilized in the 2015 *Clean Water Rule: Definition of “Waters of the United States” Final Rule* (2015 Rule) and the pre-2015 regulatory regime. The Proposed Rule then goes on to list factors to be considered when assessing whether the functions provided by the wetland, either alone or in combination with similarly situated waters in the region, are more than speculative or insubstantial. These factors include distance from a jurisdictional water, downstream TNW, interstate water, or territorial sea; hydrological factors (including subsurface flow); the size, density, or number of waters that have been determined to be similarly situated waters (and thus can be evaluated together); and climatological variables such as temperature, rainfall, and snowpack. With the possible exception of adding climatological variables to this list, which are referenced more obliquely as a factor in specifically determining “similarly situated” waters, the other factors were also addressed in the 2015 Rule.

No further clarification regarding how to determine the significance of a nexus is provided in the Proposed Rule or TSD. In fact, in relation to the above listed factors to consider, the TSD provides examples that justify evaluation of the factors in differing ways that further inhibit clarity in determining the significance of these factors. One such example acknowledges that an increased frequency, volume, or duration of a hydrological connection to ephemeral features would have more potential impacts on the integrity of downstream waters but then states that a lack of hydrologic connection completely can also contribute to the influence of these features to TNWs. While we appreciate that watersheds are complex and affected by multiple and variable site-specific factors, this lack of clarity suggests that there is no gradient of hydrologic connection that would in fact be determined to be “insubstantial and speculative.”

### B. The Agencies should provide additional guidance on how to use the various identified tools to make consistent significant nexus determinations.

There is an updated discussion of tools and modeling approaches that can be used to inform the significant nexus determination process described in Section V.A.1 of the TSD. This discussion details various tools available for mapping and remote sensing, hydrologic models, and other advancements in data, tools, and methods that can be used in jurisdictional and/or case-by-case determinations. Many of the tools in this section are more directed at identifying the locations of features that could be jurisdictional rather than providing information to be utilized in a significant nexus analysis of an identified feature. While many of these tools were available and discussed in the 2015 Rule and the Science Report, others have either been developed more

recently, are more readily available, or have increased spatial and/or temporal resolution. We appreciate the extensive list; however, there is little to no discussion of how these tools would be utilized to provide metrics and associated thresholds to differentiate between significant and non-significant effects, likely resulting in little consistency in significant nexus determinations.

Detailing these metrics for every tool listed would be an extensive effort, but we suggest the Agencies further clarify or provide examples of how these tools are to be used more specifically in determining the presence or absence of a significant nexus. First, how can the potential effect a feature has on the downstream integrity of a jurisdictional water be quantified using these tools; second, how can the measured effect then be evaluated for significance? The SAB also commented similarly on this issue in their earlier review of the draft Science report, stating the report “could be more useful to decision-making if it brought more clarity to the interpretation of connectivity, especially with respect to approaches for *quantifying* connectivity” (emphasis added). Section IV of the TSD further notes on page 157 that a “significant nexus is not a purely scientific determination”, and that “a significant nexus determination requires legal, technical, and policy judgement, as well as scientific considerations, for example, to assess the significance of any effects”. Based on these statements, clarity needs to be provided to integrate not only how to quantify effects on downstream waters and interpret their significance, but also how to assess this significance in terms of legal and policy judgment when the guidance provided for integrating these judgments is vague.

For a few of the tools listed in Section V.A.v of the TSD, the interpretation of the results in the context of a significant nexus analysis is readily apparent. For example, if a species survey of an ephemeral stream indicates that the stream is utilized as a rearing habitat for a fish species also present downstream, then clearly the ephemeral stream contributes to downstream biological integrity. However, there is a lack of clarity as to how to proceed if the results suggest no potential exists for an impact to occur on downstream waters for the parameter being evaluated. Using the previous example, if no fish are present in the ephemeral stream that is the target of the significant nexus analysis, then that suggests that there is no potential for impacts to occur to populations of that fish species from a lack of rearing habitat in the ephemeral stream. In this case, presumably other data would then be evaluated to determine if biological, chemical, or physical connectivity exists through other pathways rather than using such results to substantiate a no biological connection determination. The addition of guidance as to expectations for the breadth of the significant nexus analysis in the TSD would be helpful in terms of the number of tools or resources to be utilized if a significant nexus is not apparent in initial efforts. In addition, the use of other such tools listed in Section V.A.v in determining impacts on downstream integrity would benefit from further discussion as to how to interpret results, as there are no obvious or identified thresholds aligned with these tools to differentiate effects as more than or less than speculative or insubstantial.

In another example, information on stormwater runoff is listed as a potential tool to be utilized in a significant nexus analysis, with no discussion provided as to how this information would be used. Is the presence of stormwater discharge in and of itself considered conclusive that a



significant nexus exists downstream? At what point would a negligible discharge be considered speculative and insubstantial? While we appreciate that documenting a connection may be simpler than documenting the absence of one, additional discussion outside of merely providing a few isolated examples should be included in the TSD as to when the tools might indicate that downstream integrity is not affected more than speculatively and insubstantially. This will facilitate use and compliance by the regulated public.

In addition to the point made above, and as noted earlier in the discussion of the definition of “significantly affects”, the TSD lists out several factors to be considered when assessing whether the functions provided by the water are more than speculative and insubstantial, but it does not provide limitations as to how these factors are to be considered in a significant nexus analysis. For example, distance from a downstream TNW or other jurisdictional feature is one of the factors to be assessed, but the discussion also reiterates multiple times that large distances between the water in question and the downstream water do not preclude the presence of significant effects occurring. Section V.B of the TSD specifically contemplates Case Specific Significant Nexus Analysis but is focused only on the interpretation of “similarly situated” and “in the region” with respect to the significant nexus analysis. While guidance on these concepts is important, we would reiterate that further discussion from the Agencies is needed that is focused on how to use the available tools and resources to determine what is and, more specifically, **what is not** a significant nexus.

One suggestion for incorporating practical, repeatable, and consistent on-the-ground guidance for determining significant nexus determinations may be updating commonly used delineation documents. The Corps’ Jurisdictional Determination Form Instructional Guidebook (2007) is cited as one of the resources to be used to make a significant nexus determination to use in Section V.A of the TSD. While it is dated, this document provides straightforward guidance for waters related to easily documented functions to downstream jurisdictional features. The Jurisdictional Form included as an appendix to the Guidebook provides checklists that document some of the characteristics and functions of waters, as well as including a significant nexus section that provides a short list of questions to answer on functions provided by a tributary (for example, does the tributary provide habitat or life cycle functions for fish or other species?). If the answer to any one of these questions pointing to specific functions the tributary could perform is yes (with documentation provided), then the significant nexus analysis outcome is obvious and can be applied consistently. However, the fourth and final question within this section asks if a tributary and its adjacent wetlands (if present) has a relationship to the physical, chemical, or biological integrity of a traditional navigable waterway, which opens many more pathways to follow without direction as to what documentation is necessary to prove or disprove insubstantial and speculative effects on downstream waters. Potentially updating and revising the jurisdictional form to reflect a more comprehensive list of questions, complete with direction as to how to evaluate significance of such effects, would be a step towards completing significant nexus analyses more consistently.



**C. The Agencies leave uncertain where along the gradient of connectivity a “significant nexus” exists.**

The Science Report and Section II.A of the TSD state that connectivity of streams and wetlands to downstream waters occurs along a continuum that can be described in terms of the frequency, duration, magnitude, timing, and rate of change of water, material, and biotic fluxes to downstream waters. However, as noted in both documents, interpretation of this continuum is muddled by emphasizing that connections with low values of one or more of these descriptors does not necessarily indicate low connectivity. For example, as stated in Section IV.E.iv of the TSD, low frequency, low duration streamflow can have important downstream effects when considered in the context of other descriptors (e.g., large magnitude of water transfer). In addition, the TSD notes in several places that many of the functions performed by non-floodplain wetlands and open waters significantly affect downstream waters not only through their connections, but also through their disconnections (i.e., surface water storage mitigating flood peak flows or sequestering contaminants). Despite these statements, the TSD further notes in Section II that few scientific studies were available in their extensive literature review that explicitly addressed connections between non-floodplain wetlands and river networks, with even fewer publications specifically focusing on the frequency, duration, magnitude, timing, or rate of change of these connections. Based on these references and the lack of information for some types of waters, the concept of “gradient of connectivity” does not appear to be a factor in determining what waters are jurisdictional, as even the lack of connection is linked to functions significantly affecting downstream jurisdictional waters.

**D. The Agencies do not provide a reliable way to quantify whether connections meet the significant nexus test.**

As also discussed above, the Agencies provide a long list of potential resources that may be used to determine if a significant nexus exists; however, many of the available resources specific to these analyses have changed little since the 2015 Rule. While it is useful to have a consolidated list of resources, no consistent methods or objective metrics are identified that would allow for the reliable quantification of whether non-relatively permanent tributaries, wetlands, or other waters meet the significant nexus test in practice. As also noted above, some of the tools identified have an obvious outcome. For example, if USGS flow gage data were available for an ephemeral tributary from a location immediately upstream of the confluence with a jurisdictional water, and the data demonstrated frequent or high magnitude flows occur in the tributary, the conclusion that a significant nexus exists would be logical. However, there is no explanation provided for interpreting the results of other tools in terms of significance/non-significance. How are precipitation and snowfall data to be utilized in determining presence/absence of a significant nexus? If natural history museum collections databases document that macroinvertebrates were collected from a location on an ephemeral tributary, is that sufficient to say that a significant nexus exists even if the collection were made in the distant past? For the modeling and simulation approaches described in this section, what quantitative level of effects on downstream waters would need to be identified to be more than speculative and insubstantial? In addition, with a long list of possible tools referenced, if the initial utilized resources do not highlight a

connection between the water being evaluated and the downstream jurisdictional water, is it necessary to continue using the remaining tools and resources listed until one of them indicates an effect on integrity is occurring downstream? Do all tools need to be utilized and assessed to make a no effect determination? There is not an ultimate determining tool(s) or parameter(s) that the regulated public can confidently rely on in making a significant nexus determination. Thus, to avoid continued uncertainty in WOTUS determinations, additional clarification of the regulation is needed as to how the tools and resources are to be incorporated into the significant nexus analysis, as well as what objective decision-making criteria are expected.

### **III. The Agencies continue to draw overly broad conclusions from the literature and apply them to specific water resources such as ditches and ephemeral streams.**

Regarding ephemeral streams specifically, the Proposed Rule and TSD discuss and cite extensively the importance and abundance of ephemeral streams, particularly in the southwestern U.S., and stress that they perform many of the same ecological and hydrological functions as perennial and intermittent streams. The Proposed Rule also references the SAB review of the Science Report in Section V.B.3.b as noting that ephemeral streams are no less important than perennial and intermittent streams to the integrity of downgradient waters. Additional literature specific to ephemeral streams was also included in this discussion based on the incorporation of outside peer reviewed abstracts as a primary focus of the review in Section II of the TSD, as noted above.

While the Proposed Rule and TSD emphasize the functional similarity of ephemeral streams and tributaries with more permanent flow, the Agencies nevertheless propose different approaches for determining the jurisdictional status of ephemeral streams compared to more permanent (i.e., perennial and intermittent) streams or wetlands adjacent to jurisdictional waters. Determining the jurisdictional status for ephemeral streams, as well as for wetlands and “other waters” that do not meet the relatively permanent standard, automatically requires a case-by-case specific significant nexus analysis because, by definition, the relatively permanent standard cannot be applied to streams that have continuous flow for less than three months. However, without further clarification from the Agencies, the variety of potential approaches suggested in the TSD to aggregating similarly situated waters would likely result in a significant nexus analysis of ephemeral streams that would only rarely focus on a single stream; rather, this approach would instead aggregate the functions of all ephemeral streams within a watershed, subwatershed, or ecoregion. Although it is difficult to fully ascertain what the Agencies are defining as a “watershed” or “ecoregion”, as there are many definitions and scales for these terms found in both scientific literature and federal policy, aggregation of ephemeral streams over broad geographic scales would substantially increase the potential for a significant nexus to be established in comparison to evaluating the contributions of single ephemeral stream.

Additionally, by and large, conclusions drawn regarding the importance of tributaries in the Proposed Rule and TSD are applied to ditches, with some specific exceptions. Ditches that are streams that have been channelized are termed tributary ditches in the TSD and are generally treated as tributaries. This is stressed in Section IV.A of the TSD, which states that certain

categories of ditches are integral parts of river networks, grouping such ditches in with tributary streams and certain lakes and ponds. Section IV.A.iv focuses specifically on human-made or human-altered tributaries and the functions that they provide, and states that ditches are generally jurisdictional where they meet either the relatively permanent or significant nexus standard. Section V.D.1.a of the Proposed Rule indicates that some types of ditches are intended to be excluded from being jurisdictional, as they have been historically. However, this is a small subset of ditches defined as roadside and other ditches that are created from, and drain only, upland areas and do not carry a relatively permanent flow of water. In practice, it is unclear how this exception may be applied to roadside ditches that drain into streams in areas with seasonal, isolated wetlands which expand and contract to connect with these human-made features on an annual or occasional basis in areas such as the Rainwater Basin in Nebraska, prairie potholes in North Dakota, or vernal pool complexes in the Central Valley of California. Previous attempts at clarifying jurisdiction over these and similar areas have proven unworkable in practice, and the Proposed Rule appears likely to lead to a similar result.

Similar broad consideration is given to water impoundments. Under the Proposed Rule, impounding a water feature can create a relatively permanent water, even if the feature that is being impounded is a non-relatively permanent water. For purposes of implementation, relatively permanent waters include areas where water is standing or ponded at least seasonally (generally defined as three months, though it may be as little as two months in certain regions of the county as described in the TSD). Under this scenario, it is unclear how the Proposed Rule would approach stormwater detention basins that could flow to streams and rivers through culverts or outfall structures.

#### **IV. The connection between regulatory authority and the longstanding regulatory definition of wetlands is unclear.**

The Proposed Rule and TSD focus extensively on the physical, chemical, and biological connectivity aspects of wetlands and streams to TNWs, to assist in making a significant nexus determination. While a primary goal of the Proposed Rule is to clarify the interconnectivity of aquatic resources to determine regulatory authority, there is a noticeable absence of discussion regarding the three-parameter approach and how it relates to the Proposed Rule. The incorporation of the wetland parameters, namely hydrology, soils, and vegetation, have allowed for consistency and repeatability in wetland determinations and practical policy since 1986, and have allowed the regulated public to understand and comply with the Clean Water Act. The absence of discussion regarding the three parameters and how they correspond to significant nexus determinations leads to a lack of clarity in understanding how to apply the Proposed Rule. This is especially true for non-floodplain wetlands, particularly in relation to seasonal flows from overflowing wetland features such as California's vernal pools, as referenced in the TSD. Overflow areas may provide brief overland connectivity to TNWs and support one or two of the wetland parameters though not all three, especially in the context of hydrologic duration. Therefore, it would appear that these overflow areas would not fall under federal jurisdiction under the 1986 rules and that these locations are being referenced simply to demonstrate the brief connectivity to more permanent waters. However, without this being clearly stated, it is difficult

to confirm this assumption. Similarly, confusion could arise in developing significant nexus determinations in the mid-west such as the playa pools in the Rainwater Basin region of Nebraska. Many of these features experience significant seasonal expansion and contraction that could result in additional regulation under the Proposed Rule due to overflow connections into intermittent or permanent streams. Yet, many of these features exist in active agricultural fields where vegetation elements are absent. It is therefore unclear how the three-parameter approach will correspond to significant nexus determinations when regulating such seasonal features.

Finally, while the three-parameter approach for wetland determinations incorporates biologic elements related to vegetation, the Proposed Rule and TSD include amphibious wildlife components in the justification of the significant nexus determination related to wetland connectivity. For example, the American toad and Eastern newt are discussed in the context of how wildlife resources depend on seasonal aquatic features and simultaneously connect these features to one another. While aquatic features play an important role to all animal life, it is unclear how habitat connectivity for these species relates to the three parameters and, thus, jurisdiction over the aquatic feature as a water of the United States. Wildlife species, such as the California red-legged frog may utilize small “flashy” pools, or even upland grasslands, for temporary habitat during seasonal movement between ponds, which may be as far apart as five miles. These areas rarely have more than one of the three wetland parameters despite facilitating species dispersal. It is again assumed, due to the 1986 procedures, that because these features do not support all three parameters, they would not fall under jurisdiction of the Clean Water Act; however, a bright line clarification would be beneficial to understand the regulatory relationship between “connectivity” under the context of significant nexus determinations and “wetlands” in the Proposed Rule.

## **V. The Agencies’ approach to aggregation of “similarly situated” waters lacks clarity.**

### **A. The Agencies do not propose an approach to aggregating multiple different water types within a watershed.**

The TSD does not propose a specific approach for aggregating multiple different water types within a watershed as “similarly situated”. Instead, the Agencies indicate that they are soliciting comment on how to implement this concept in the final rule and provide a discussion of the literature justifying the functional aggregation of groups of waters in Section IV.E.ii. In Section V.B.i of the TSD, it states that the *Rapanos* guidance interpreted similarly situated to mean a tributary and its adjacent wetlands, but that the Agencies could implement the final rule consistent with this approach or take a differing approach. Alternative approaches were briefly discussed. These potential approaches included interpreting “similarly situated” in terms of waters that provide common, or similar, functions to downstream waters, such as considering tributaries similarly situated with other tributaries and wetlands similarly situated with other wetlands. Other proposed approaches would consider flow regime (i.e., ephemeral streams with other ephemeral streams) or stream order (i.e., all first order streams are similarly situated). In addition, all wetlands within a complex or the length of the entire tributary from source to confluence with a traditional

navigable water could be considered “similarly situated”. With so many potential options as to how the Agencies may eventually define “similarly situated”, determining which approach is sufficiently supported is difficult. Considering all tributaries “within the region” (as discussed below) as being “similarly situated” appears overly broad and dependent on the region assessed based on the variability in flows, stream habitat, and aquatic populations that could potentially occur within tributaries in a watershed, subwatershed, or ecoregion, none of which are clearly defined. In addition, depending on the length of the tributary, variability of the assessed factors throughout its length is likely to occur. Some variability would also be expected to exist in most watersheds with the somewhat narrower interpretations as well, although to a lesser extent.

For example, could a roadside ditch be aggregated with a lake that is miles away, or a slough aggregated with an intermittent stream? Because no clear approach regarding the aggregation of features was proposed, it is unclear if such scenarios would occur. Based on the discussion provided above, the interpretation of “similarly situated” could potentially be used to aggregate a variety of different types of aquatic features if the Agencies could demonstrate that all assessed features provide a similar function to downstream jurisdictional waters. While distinct categories of aquatic features would appear to differ functionally in many ways, if “function” was interpreted broadly, these features could potentially be aggregated together. Interpretation of “in the region” will also be a determining factor as to whether there is the potential for such features to be assessed together, as discussed below.

**B. The Proposed Rule does not make clear what the Agencies consider “similar functions” or how waters should be deemed “similarly situated.”**

Within Section IV.E.ii, the Agencies provide some examples related to “similar functions” for various aquatic resource classifications. Most of the provided examples relate to how the effects of any single tributary or wetland on downstream waters may be limited in frequency or magnitude with respect to a specific function that is provided, while the cumulative effects from all tributaries or wetlands would be more substantial. One example is provided of cumulative effects related to the magnitude of baseflow contributed by ephemeral streams for downstream waters in arid landscapes. The TSD presents no discussion regarding the methods necessary to assess whether waters perform similar functions. This section also discusses cumulative effects over time as a consideration when determining the effects of “similarly situated” waters, and notes that by aggregating “similarly situated” waters together, the distance downstream by which the effects may be considered significantly increases.

In sum, evaluating whether the science is sufficient to support the aggregation of the waters would be reliant on what approach to “similarly situated” the Agencies ultimately decide to take in the final rule. Literature citations and summaries provided within the TSD support the validity of aggregating waters and make the case that generally, if waters are aggregated by function, and the scope of the function is interpreted broadly, sufficient support for this approach is available. However, the factors that the Agencies are proposing for consideration (i.e., distance from a

jurisdictional water, downstream TNWs, hydrologic connections, the size, density, or number of waters that have been determined to be similarly situated, and climatological variables) as discussed above, would be highly variable if assessed more specifically on a stream-by-stream basis. As an example, assessing all tributaries within a watershed and determining that, as an aggregate, they contribute to decreased stream temperatures downstream could be easily demonstrated. By contrast, if individual tributary data were instead evaluated, some tributaries within the aggregate may be shown to have a higher proportion of (colder) groundwater input or significant shading compared with other streams within the watershed that would therefore exert differing influences on stream temperatures downstream.

**C. The Agencies do not make it clear whether they consider a significant nexus determination for one water within a watershed sufficient to bind other waters within the same watershed.**

Neither the TSD nor the Science Report demonstrate a clear policy linkage between how a significant nexus determination for one aquatic feature may impact other aquatic features within the watershed. However, this is likely the intent due to the extensive discussion of aggregated waters as addressed throughout this memo. To better understand the Proposed Rule's approach to these policy connections, additional clarification would be required regarding the scale at which aggregated waters are being assessed (e.g., ecoregion level, what level of Hydrologic Unit Code or HUC, etc.). Further, there would need to be a better understanding of what role different wetland classifications play in different ecosystems and at different levels. For example, palustrine emergent temporarily flooded (PEMA) wetlands in a 6-digit HUC assessment may perform different functions regarding flood control and sediment movement versus how PEMA wetlands function within a 12-digit HUC at the very top or very bottom of the watershed. Additional clarification from the agencies is needed to determine both the scale at which significant nexus determinations are made and how this may relate to aggregating wetland classifications.

**VI. "In the region"**

**A. The Agencies' approach to "in the region" lacks clarity.**

The Agencies describe "in the region" as "waters in a contiguous area of land with relatively homogenous soils, vegetation and landform ... providing similar functions such as habitat, water storage, sediment retention and pollution sequestration." A "region" could also be an "ecoregion" or a "hydrologic landscape region." As with "similarly situated", the Agencies are not proposing a clear approach by rule and are instead soliciting comment on how to implement this concept, challenging the ability to evaluate whether the science supports any or all of the proposed approaches. Based on the discussion in Section IV.E.iii and V.B.2 of the TSD, the Agencies indicate that they could implement the scope of "in the region" in significant nexus determinations based on the guidance in *Rapanos*. This guidance utilized the concept of a relevant "reach" of a tributary which was defined as the entire reach of a stream that is of the



same order, with the wetlands adjacent to the reach also considered for the purposes of a significant nexus analysis. Alternatively, other approaches to defining a “reach” and aggregating waters “in the region” are also proposed with a broad range of scales considered. Watersheds are noted as being generally regarded as the most appropriate way to interpret in the region, but there are multiple other options discussed, including sub-watersheds, ecoregions, hydrologic landscape units, or physiographic divisions. A discussion of the challenges in utilizing some of these methods when the assessed area is large is included in the TSD. As previously mentioned, however, the precise definitions of these terms vary extensively throughout the scientific community, making it challenging to determine the intent of the Agencies and understanding how large is too large is not spelled out.

In short, the more expansive the definition of “in the region” is, the more difficult it is to determine the measurable contribution of a single feature on a downstream water. Even at the finest ecoregion scale, conducting a case-by-case significant nexus analysis of all “similarly situated” water within a Level IV ecoregion would suggest that measurable effects of any single water on downstream waters is obscured. Some of the other broad scales proposed for defining “in the region” would have similar results. As another example, if unique systems exist even within an 8-digit HUC as we have often observed in the intermountain west, evaluating these systems on this scale for a significant nexus analysis would be inappropriate. Without the Agencies providing direct guidance on the scale of “in the region”, this concept is left open for interpretation on a case-by-case or district-by-district basis. Further clarity is necessary for consistency in significant nexus determinations of jurisdictional waters.

## **VII. Climate Change**

### **A. Impacts of Climate Change to regulated wetlands in the Proposed Rule**

Climate change is discussed in the TSD and the Proposed Rule, especially in relation to significant nexus determinations. However, it is unclear what the intent of this discussion is in relation to applying WOTUS. For example, the TSD discusses how climate change will result in areas currently not considered under regulation becoming increasingly important for providing wetland services over time. This may include the inland migration of coastal wetlands into areas planned for development which currently do not meet all three criteria for regulated wetlands, but which may achieve these criteria in the future due to rising sea levels. Similarly, the TSD references studies which state that an increasing number of streams may become more ephemeral under existing climate change models (p. 153-155). Through this discussion, the TSD appears to be alluding to factoring future climate change scenarios into case-by-case significant nexus determinations made in the present. This assumption seems to be confirmed by the statement on page 37 of the TSD, “Because of their aggregated influence, any evaluation of changes to individual wetlands should be considered in the context of past and predicted changes (e.g., from climate change) to other wetlands within the same watershed.” Following this same logic, consideration by federal staff of suitable wetland mitigation plans may require time consuming evaluations by Agency staff to ensure wetland impacts are appropriately mitigated under a variety of hydrology and climate models.



If it is indeed the intent of the TSD and Proposed Rule to assess climate change impacts on individual wetlands, this is a task that is currently impossible to repeat with consistency, clarity, and repeatability. While climate models have continuously improved over the past three decades, it is our understanding that accurate site-specific assessments of climate change impacts are still unavailable. This seems to be acknowledged by the Agencies as well by the TSD's evocation of global, national, and broad regional climate change trends. For example, the TSD discussed trends showing more increases in precipitation and increased flooding *likely* (emphasis added) in the Northeast and the Midwest, while models predict decreased precipitation in the Southwest and Southern Great Plains where droughts may become more frequent, prolonged and intense (p.153). The TSD, Proposed Rule, and SAB are silent regarding specific watershed impacts. To further consider each aquatic feature in the context of "past and predicted changes" appears to be setting up Agency staff for making speculative and insubstantial determinations when evaluating a significant nexus and/or "rubber stamping" a no climate change determination on a permit. In either instance, the result will be unenforceable and confusing regulations, leading to difficulties in effective policy implementation. It is our experience that predictive judgements on definable criteria, such as the three criteria for wetland determinations, should not be incorporated into active policy as this will lead to consistent readjustments as science and our understanding of the future climate will continue to evolve in currently unforeseen ways.

Further, and as discussed above, permit timelines and staff resources will likely already be stressed in reviewing significant nexus connections for existing resources; these strains will become further pronounced should these determinations also require consideration of future wetland areas under various climate change scenarios.

## **VIII. Practical Considerations of Proposed Rule Implementation**

### **A. Impacts of the Proposed Rule to meet the clear, consistent, and replicable standards for the proposed significant nexus approach across districts and project types.**

The TSD places significant emphasis on the goal of discouraging determinations which have "speculative or insubstantial effects on...foundational waters". Further, the preamble of the Proposed Rule, as well as numerous public documents and statements released by the Agencies make it clear that the Proposed Rule also seeks to provide national and durable guidance related to Clean Water Act implementation. Assuming these goals are achievable, this will allow for straightforward wetland determinations, fewer policy shifts between administrations, and reduce the need for individual states to develop costly regulatory programs, all of which will allow for improved planning and policy implementation by the regulated public.

To achieve this goal, however, it is important for the Agencies to provide clear, consistent, and repeatable guidance on Clean Water Act implementation. Specifically, and as discussed above, the Agencies need to provide more clarity regarding the limits on factors that are used to

determine what “significantly” impacts downstream waters so that these factors can be applied consistently across USACE districts. While different ecosystems have different factors that can impact downstream waters to various degrees, broad assumptions need to be identified for effective project planning. For example, the TSD stresses the importance of considering “the size, density, and/or number of waters that have been determined to be similarly situated” when evaluating impacts to downstream waters. It goes on to say that an increasing number, size, and density of aquatic features in an area will have a larger impact on downstream waters and thus should be regulated due to their physical, chemical, and biological importance to TNWs. However, the TSD also states that a small number or low density of similarly situated waters can have “disproportionate effects on downstream foundational waters.” These opposing statements make it difficult for the regulated public to determine whether permitting requirements apply in the first instance and, if so, to effectively develop and implement plans that most effectively avoid and minimize impacts to sensitive aquatic features and “do the right thing” when applying for federal permits.

Similarly, the undefined nature of factors listed in the TSD that may significantly affect downstream waters as previously discussed, such as the distance from a jurisdictional water, the distance from downstream TNWs, hydrologic factors, and climatological variables, make project assessment and compliance extraordinarily arduous for the regulated public. While the key findings of the Science Report indicate that all these factors impact downstream waters, neither the TSD nor the Proposed Rule provide sideboards regarding to what degree an impact constitutes a Significant Impact in relation to downstream waters, thus leaving this to a case-by-case analysis by the Agencies, which already often lack sufficient staff to meet permitting timelines. These demands on the Agencies’ resources will most certainly lead to additional delays and undoubtedly speculative or insubstantial determinations by staff in an attempt to balance workloads.

Further, the TSD states that “geographic isolation should not be confused with functional isolation.” This concept is fleshed out throughout the TSD and the Proposed Rule, particularly in relationship to biological connections. Both sources describe the “steppingstone” movement of amphibians, invertebrates, reptiles, mammals, and seeds of aquatic plants as a demonstration of biological connectivity and described this connectivity as being important in the persistence of the integrity of downstream waters. While the gradients of biological connectivity may differ between sites and organisms, “...ultimately the connection to determine whether there is sufficient connection to downstream waters will either require estimation of the magnitude of material fluxes or evidence that these movements of organisms are required for the survival and persistence of biota that contribute to the integrity of downstream waters.” This determination seems highly subjective and difficult to calculate without more clear guidance provided by the Agencies. Additionally, while the Agencies provide the assessment tools previously discussed to determine the connectivity and location of wetlands from aerial photographs or hydrology, there is little guidance on what tools are available to assist the regulated public in determining the amount or significance of biological connectivity in a way that is consistent and repeatable. Given the inherent complexity of food webs across the numerous ecosystems present in the U.S., it would be nearly impossible to definitively determine that there would be no impact to

biological connectivity from impacting even the most isolated wetland features. This would again result in extreme hardship for the regulated public in identifying the least impactful alternative.

Finally, the TSD and the Proposed Rule state that “the Agencies have developed extensive experience making significant nexus determinations. The Agencies have made determinations in every state in the country, for a wide range of waters in a wide range of conditions.” While this is undoubtedly the case since the *Rapanos* ruling, common and shared experiences of the regulated public have demonstrated that different USACE districts take a different approach to interpreting the regulations, even in areas that have climatic, topographic, and biotic similarities. Rather, the difference in applying regulations between districts is often associated with the predominant cultural acceptance of regulation within that region. A clear example of this can be observed in the mitigation policies and requirements related to mitigation performed under the Clean Water Act. While some districts show significant acreages dedicated to mitigation and stringent requirements associated with land protections and management associated with these projects, adjacent and similar districts show nearly no mitigation occurring within the past 10 years and require much less certainty regarding the long-term durability of the required mitigation. This is despite the highly prescriptive nature of the Agencies’ *Compensatory Mitigation for Losses of Aquatic Resources under CWA Section 404, Final Rule* (aka 2008 Mitigation Rule). While the discrepancies in implementation of the 2008 Mitigation Rule undoubtedly includes functions of microclimates, somewhat variable topography, and levels of disturbance, it is also most assuredly a reflection of the general culture within which each district is located. Therefore, practical implementation of the Proposed Rule and a reliance on a case-by-case approach related to significant nexus determinations will be nearly impossible to predict or replicate by the regulated public without more specificity regarding limits to assessed factors.

In sum, while we understand and appreciate a goal of non-speculative, consistent, and clear regulation, the Proposed Rule does not provide sufficient guidance to allow for the regulated public to plan, implement, and operate projects in a manner that avoids and minimizes impacts to regulated aquatic features on a consistent basis. If regulatory compliance is perceived to be overly challenging, time-consuming, and a “moving target” regulatory buy-in will diminish, leading to additional litigation that may or may not be resolved within a foreseeable timeframe. Thus, the Agencies’ goal of developing a durable policy of the Proposed Rule will not be met.

**B. Ability for the Agencies to effectively process the additional review of tributaries, other waters, and adjacent wetlands when applying the proposed significant nexus standard.**

The Proposed Rule may result in significant strains on the time and resources available to the Agencies. As previously discussed, the Agencies have been making significant nexus determinations for over a decade, and thus may have a certain comfort level or streamlined processes associated with making these determinations, the emphasis on case-by-case assessments in the Proposed Rule for non-floodplain and other waters without a bright line test for determining connectivity will require additional consideration by federal staff. While existing

tools have been identified in the TSD to assist the Agencies with this workload, databases such as the National Wetland Inventory (NWI) often require additional ground truthing to confirm the accuracy of hydrologic connectivity and the ability of mapped resources to meet all three wetland criteria. Further, while efforts to develop new tools, such as the rapid field-based stream duration assessment method (SDAM), is appreciated it is a common experience of the regulated public that such tools often require significant effort to develop, test, and appropriately adapt to individual USACE districts and/or ecosystems. Examples of the level of effort necessary for creating assessment tools that allow for repeatable, consistent, and accurate determinations are abundant from hydrogeomorphic (HGM) approaches to stream quantification tool (SQT) procedures which are currently being developed and adapted across the U.S. Therefore, it should be assumed that significant staff time from the Agencies will be required for the development, refinement, and public outreach efforts related to the creation and common implementation of these tools. Further, additional effort by the Agencies will be necessary to ensure consistency within and across districts to make case-by-case determinations until these methodologies are finalized.

Further, it is unclear if the tools discussed or the Agencies themselves are adequately equipped to accurately evaluate the potential of individual species or organisms to move through complex interlinked water habitat types and the extent of use for these organisms within these various habitats, as described in the TSD. This may be of relevance when assessing aquatic resource connectivity, fish habitats, and floodplain conditions for the determination of a significant jurisdictional nexus as the interrelationships between these habitat elements may change significantly depending on the frequency of large storm events, runoff flows, or other climatic occurrences year over year. The potential inexperience of Agency staff, who until now may not have commonly worked within this area of expertise, will result in additional strain on the Agencies as they attempt to either train their workforce or incorporate this expertise from other federal or state Agencies.

The regulated public depend on a clear process and defined timelines for permits and compliance requirements associated with the Clean Water Act. The increased emphasis of reviewing highly complex ecosystem interactions on a case-by-case basis using generalized tools will likely lead to confusion and unintentional violations. The Proposed Rule indicates that no additional staff or budget will be required to implement the new regulations. While we understand the realities of federal budget processes, it is important to be realistic that additional resources will be needed to accurately and consistently make significant nexus determinations to allow vital projects to continue to progress within existing federal timeframes.

**C. Challenges related to administration priorities under the proposed significant nexus standards.**

Significant nexus determinations made on a case-by-case basis for ephemeral features and isolated wetlands in arid regions in particular may result in significant challenges to addressing climate change and other significant economic or societal goals. This includes high priority federal objectives such as the Department of Energy (DOE) goal of facilitating the development

of 10 million acres of solar farms, primarily in the sun belt, across the U.S. by 2035. While the TSD states that the “science is also clear that wetlands may significantly affect downstream waters when they have other types of surface connections, such as wetlands that overflow and flood jurisdictional waters” it does not consider what impact regulating these undefined connections may have on encouraging new alternative energy and associated transmission projects in locations throughout the southwestern U.S. For example, the TSD emphasizes the important cumulative effects of ephemeral flows in arid landscapes, “which are key sources of baseflow for downgradient waters”. Ephemeral features can play an important role in the ecological functions of arid landscapes. However, an undefined approach to regulating arroyos, washes, swales, and other similar features that carry waters only occasionally may result in significant challenges to meeting federal climate, infrastructure, and economic stimulus goals, especially in tribal areas and rural communities. Implementing these goals may become further challenged without further specifications from the Agencies regarding flood event frequency on arid landscapes necessary to demonstrate connectivity to isolated wetlands. Developing a regulatory framework established around annual non-floodplain wetlands and navigable water interactions requires a different approach than making a similar policy that connects these aquatic features on a 5, 10, or 100-year timescale. Additional clarification in this regard is necessary for effective policy for both the private and public sector.

Similarly, the TSD also describes how western vernal pool complexes are connected to navigable waters via seasonal vernal pool overtopping that results in overland flow across upland areas. Vernal pools are known to provide valuable ecological functions as well as critical habitat for threatened and endangered species. However, inclusion of these overland flow areas as justification for a significant nexus determination without additional guidance will establish additional hurdles to implementing high priority large scale public transportation projects. An example of this may be the completion of California’s high speed rail system. This public transportation project is currently mitigating for hundreds, if not thousands, of acres of impacts to the Central Valley’s numerous vernal pool complexes. The addition of protecting occasional upland connectivity pathways between vernal pool complexes and navigable waters will undoubtedly significantly increase these mitigation requirements, further hindering completion of this long-term project. It is, therefore, important to clearly define the sideboards of wetland connectivity by rule to aid in the development of efficient and durable significant nexus determinations necessary to meet important climate, transportation, and economic goals.