

Unusually Sensitive Areas - Definition
Workshop for Technical Reviewers
April 27 & 28
Washington, DC

The purpose of the workshop was to familiarize invited technical reviewers with the work that has been performed in defining and pilot testing a definition for Unusually Sensitive Areas (USA).

Jeff Wiese (DOT) opening remarks

Jeff Wiese opened the workshop by thanking the invited experts for their participation. He characterized the workshop as an opportunity to stand back from the details of doing the work and to see if the product fits the need.

USAs have been defined in terms of drinking water systems and ecologically sensitive areas. The definitions have been piloted in three states - California, Louisiana, and Texas. Between them, these states contain approximately 45 percent of the nation's hazardous liquid interstate pipelines. Work will proceed on applying the definition in other states once agreement has been reached on the specifics of the definition.

DOT does not expect that the work that has been done is perfect. This will likely be an iterative process, with refinements made over time as additional information becomes available. The question to be answered in this review process is whether the development that has been done to date is adequate to proceed.

The USA project is about where to focus time and resources. It seeks to identify areas that are irreplaceable or irreparable. The goal is to define those areas in such a way that they can be depicted, on a map, for pipeline operators to use. It is important to remember that USAs are not our "only shot" at protection. Other regulations and company practices already provide a high degree of safety. USAs are to assure that priority attention is placed on those areas that would be unusually affected by a pipeline spill.

The USA definition does not, in itself, apply any protections. The definition will be applied in other actions. The first of those is a rulemaking on enhanced protection in high consequence areas, published in the Federal Register for comment on April 24, 2000. "High consequence areas", as treated in that rulemaking, include USAs and areas of high population density. Reviewers are invited to comment on the definition of high consequence areas in that rulemaking as well as on the definition of USAs.

Louise Scott (API)

Louise added her thanks to the technical reviewers. She noted that there has been significant discussion covering many areas in reaching this stage of the project.

Christina Sames (DOT)

Christina described the purpose of the workshop as being fourfold:

- Educate the reviewers on the meaning of the definition and on the pilot test that has been conducted.
- Describe the model that has been created from the definition. The model is important so that the definitions can be applied to produce results capable of being depicted on a map.
- Provide an opportunity for reviewers to ask questions.
- Provide an opportunity for reviewers to interact.

Christina then provided an overview presentation of the development of the USA definition to date. The slides used in this presentation have been posted to the OPS web site (<http://www.ops.dot.gov>).

The need to define USAs results from a 1992 Congressional mandate. That mandate was very broad. It was refined and focused by Congress in 1996, requiring consideration of areas where permanent and long-term damage could result. There has been a conscious decision not to

consider cultural, recreational, or similar resources under this definition. While such areas might suffer harm in the event of a hazardous liquid release, that harm is unlikely to be irreparable in the same manner that critical drinking water resources or ecological resources could be affected. Cultural and other resources may require additional protection, but that would be a separate initiative.

The USA maps ultimately will be available on the OPS web site. They will depict the areas of USAs. They will not include all of the information regarding why a particular area was classified as a USA. They will be capable of being overlaid on the national pipeline system map, also being produced by OPS.

The pilot was a joint effort of OPS and API. Two contractors were involved, with each reviewing the work of the other. Data had to be manipulated in some cases, because it was not always available in the form needed. Technical review will include examining how that was done. Reviewers are expected to use their own experience to validate the selection of USAs in the pilot states.

Not all USAs will require additional protection. Risk assessments to be conducted by operators will consider whether a spill could reach a USA. Areas that are "uphill" from a pipeline, for example, will often not require protection. In addition, operators have already identified these areas in many instances and are taking additional precautions. Those precautions may already meet future protection requirements that may be imposed. It is therefore important to consider USAs not in terms of any particular protection to be provided, but rather on their intrinsic importance as areas that need to be protected because of "unusual" sensitivity.

The situation is dynamic. Critically imperilled species and drinking water sources change over time. The USA maps will need to be updated periodically. Changes to the fundamental definition should be less needed, if the bases for identifying USAs have been well described.

Jack Williams (Colonial Pipeline)

Jack Williams described the elements of the definition of USAs pertaining to drinking water. Jack's slides are also available on the web site.

Whether or not there is an adequate alternate source of drinking water is a key issue. This gets back to the question of whether the resource is irreplaceable.

In response to a reviewer's question, it was clarified that protection is focused on a well head or intake, and not on other places at which an aquifer could be affected.

Michael Macrander (Equilon)

Michael Macrander provided an overview of the elements of the definition of USAs pertaining to ecological resources. Portions of Michael's slides are available on the web site.

The ecological approach is essentially a spatially explicit model grounded in uniform data and availability, uniform susceptibility to long-term irreversible, irretrievable impacts (determined consistently nationwide), and capable of being geographically depicted. Generally, all environmental resources included in NOAA guidance for development of area contingency plans and spill response plans are included as candidates. They may be screened out later in the process.

Michael noted that there is not a one-for-one correlation with species listed as threatened and endangered (T&E) under the Endangered Species Act. Species listed as imperilled and critically imperilled (used as filters in the definition) include about 90 percent of T&E species but also include other species not listed.

Plenary Session Questions and Answers

Question: What was the rationale for selecting 3 species as the basis for defining multi-species protection areas (MSPA)?

Response: It was somewhat arbitrary. "Multi" obviously implies more than one. At the same time the number could not be so high that MSPAs would seldom be created. Three seemed appropriate based on the data available.

Question: Was a comparison made considering use of other MSPA bases, for example 1 or 5?

Response: It was considered, but data were not available to do a detailed quantitative analysis. It appeared in California that consideration on the basis of a single species would essentially define the entire state as a USA, while 5 would define very little.

Question: Is "critically imperilled" based on a national registry in order to assure uniformity?

Response: The focus is on global ranking, not ranking on a State basis. There may be some species with very limited occurrences in a State because that State is at the edge of its range, but the species may be numerous elsewhere. It was felt that it would not be appropriate in such an instance to focus resources on the limited occurrences in one State in this kind of national program.

Question: What is the basis for the one-mile buffer around critical species occurrences?

Response: It is a reflection of the general accuracy with which the critical species have been mapped. It also creates a 2-mile diameter circle, which provides a high likelihood that the necessary habitat is being protected. It also considers that terrestrial spills are less mobile than aquatic. The aquatic definition uses a 5-mile buffer due to the higher mobility of spills in water and the methods generally used in identifying imperilled aquatic species, which tend to be broader than terrestrial "point" location. Aquatic species also tend to be more susceptible to

spills.

Question/Comment: Reviewers were encouraged to review critically the filtering criteria, and particularly how lakes fit into the models. The 5-mile buffer may not be appropriate for lakes.

Response: For small lakes, they are all encompassed within the model. For larger lakes, the area five miles around water intakes is specified. It is important to remember that this definition applies to protection, not spill response.

Comment: There was a spill earlier this year near Dallas which resulted in a lake used by several communities being unavailable for drinking water.

Response: Operators must consider the possibility of transport into a USA, not just whether their pipeline intersects a USA, in their risk assessments. This would tend to include the larger area of large lakes in protective measures.

Question: Considering review of water protection in other contexts, do the 2000 ft radii, etc. consider times of travel?

Response: Yes. Generally they consider worst case transport.

Question: What are the buffer distances for water?

Response: For well head protection areas (WHPA), we rely on state definitions. A 2000 ft. radius is used where a protection area is not defined by a state. The WHPA is doubled in instances in which the well is from a sole source aquifer. For a surface water intake it is five miles upstream. For ecological considerations water is treated as of two kinds: open and isolated. For open waters the buffer is five miles upstream and downstream, and 1/4 mile around the waterway. For isolated waters (where the water doesn't extend five miles) a one-mile buffer is used.

Question: Does the USA definition consider that pipelines are usually buried at 3 to 5 foot depth?

Response: No. The USA definition is based on the characteristics of the areas. Positioning of the pipeline would be a factor to be considered in operator's risk assessment efforts. USA's are also intended to guide future right-of-way locations, not just existing pipe.

Question: How was critical habitat taken into account for federally-designated species?

Response: That issue was discussed extensively. Critical habitat is not designated for all T&E species. For many where a habitat is defined, it is done on a biological basis, not spatially. Therefore, this factor was difficult to deal with in a spatial analysis procedure. For these reasons, critical habitats did not seem to be a useful variable. To the extent that critical habitats have been mapped for a species, they became the candidate USA for that species. For those not mapped, default sizes were set in a manner intended to have a high likelihood of capturing critical habitats.

Question: Is there an opportunity for verification/validation as new information is identified?

Response: Yes. The maps will be reprocessed periodically, probably every few years, to reflect new information.

Question: Does the process provide for operators finding unexpected subsoil conditions that could change an aquifer classification?

Response: No. Consideration was on a global basis. That kind of information will also be treated in operator risk assessments.

Comment: Environmental Defense (formerly Environmental Defense Fund) intends to propose a petition process for the public to provide to OPS information that may not have been considered or that changes after consideration.

Question: Many caves have a recharge area larger than five miles. Was that considered? Was agricultural use of water considered?

Response: No. Troglodytic species are considered in the methodology. The ability to affect the resulting USA, which could involve the recharge area, would be considered by the operator in assessing his ability to affect the USA. Agricultural water uses were not considered.

Question: What will trigger operator risk assessment?

Response: That will be in response to other rules and will be driven largely by the ability of a pipeline to impact a USA.

Following this discussion, the workshop broke into two breakout sessions, one dealing with issues related to drinking water and the other with those related to ecological resources. Those breakout sessions are described in the notes that follow.

The workshop reconvened in plenary session on April 28, following the breakout sessions. At that session, Christina Sames outlined what is expected of the technical reviewers. Each is expected to review the methodology and the pilot results using his/her own experience. Each is requested to consider whether:

- •The model is academically sound
- •The assumptions made are valid
- •The data used are adequate and appropriate
- •The data collection and manipulation process & procedures are sound
- •The results identify and depict the majority of the USAs within the 3 pilot states.

Reviewers were requested to provide specific recommendations on how to revise the model if they recommend use of new data sources. Reviewer reports are to be provided to OPS by May 19, 2000.

Breakout Session: Drinking Water USAs

An introduction to the breakout session was provided by Christina Sames (OPS).

Jack Williams, Colonial Pipeline, presented the details on the development of the USA maps for the pilot states for drinking water. This included a review of the Filter Criteria and process by which drinking water sources were identified and evaluated to identify candidate USAs and USAs. The slides used by Jack are to be placed on the OPS web site (<http://ops.dot.gov>) for access by others.

Following are some of the questions, comments and issues that were discussed during the breakout session.

Question: What is the identification of USAs intended to apply to?

Response: DOT regulated hazardous liquid pipelines.

Question: What is a regulated hazardous liquid pipeline?

Response: Pipelines that transport petroleum or a petroleum product. See 49CFR part 195

Jack Williams reviewed the definitions used in the model for: Community Water Supply; Drinking Water Resources; Adequate Alternate Water Supply; Public Water Systems; and others.

Comment: The 1-month period used (versus 3-months) for longevity of an Adequate Alternate Water Supply (AAWS) may not be conservative enough.

Christina Sames discussed the methods used to identify if AAWS were available. In essence, it involved thousands of phone calls to the identified water system operators.

Question: If the USA criteria is one where long-term, irreparable impact could occur, why use a

3-month duration for an AAWS?

Response: Technical reviewers were asked to look at the technical basis and comment on whether 3 months was too short. Several opinions were expressed that 9 months to 1 year may be a better criteria. One implication expressed is that the definition of a USA might possibly need to be "tweaked" for drinking water resources since the "4I's" (irreplaceable, irreparable, irretrievable, irreversibly injured) aren't clearly apply.

Jack Williams reviewed "notable exceptions" to the filter criteria.

Question: Isn't there another data resource, other than asking the system owners, to identify if an AAWS exists, especially on smaller systems?

Response: Texas has created a database, but most states have not. Interested in receiving comments on another possible approach.

Question: Why not simply follow state defined source water protection areas?

Response: Christina Sames noted that most SWPAs will not be finished for several years and OPS is under the gun to define USAs and issue a rule as soon as possible. Could consider the SWPAs if they were available. Several reviewers recommended including the SWPAs with the proposed filter criteria to consider additional USA areas.

Question: What are the incidences of new pipeline construction (i.e., what is the current and future projected rate of new construction)?

Response: Minimal compared to what is already in place.

Bill Horton, RPI, reviewed the Drinking Water USAs identified for the pilot states and the criteria/process used to identify them. This was done with the use of the mapping system software. Bill discussed the Source Data Requirements for data imported into the system. These included that data must be in digital format and provide geographic coordinate information for each well. He also demonstrated and discussed various map overlays in the system, including:

- -Aquifer Maps
- -Surface Geology Maps
- -Sole Source Aquifer Maps
- -Wellhead Protection Areas
- -Adequate Alternative Source Data

Bill performed various manipulations of the mapping data to show the mapping results, in response to questions from the technical reviewers.

Issue,

General

Agreement: Unless it is confirmed that there is an AAWS, the USA candidates should be made USAs.

Comment: The Assumptions and Methods used regarding boundaries/buffers (e.g., the assumed 5-mile radius buffer) should be posted on the OPS Internet site for information.

Comment: Make the GIS data used in the identification of Drinking Water USAs from the pilot test available to the technical reviewers for their manipulation and evaluation.

A comment was made that the model is a GIS application with specific logic rules applied. It was requested that the logic rules and the process flowchart should be discussed in this meeting. It was noted that the information is included in the technical reviewers' handbook. A review of the USA identification process flowchart from the technical reviewers handbook was led by Jack Williams and Bill Horton.

Christina Sames reiterated that the DOT's goal is to define and identify USAs by 12/00. It is realized that the data sets will continuously change and the USA data will have to be periodically reviewed and reevaluated for updating.

Comment: OPS should use SWPA in addition to WHPA and apply the USA filter criteria for groundwater.

Issue: Older wells may leak at shallow depths and be susceptible to surficial contamination.

Suggestion: Feedback data to the states for further evaluation by the states of suspect or indeterminate wells. Note or flag those wells in the USA database for further evaluation.

Issue: The technical reviewers were charged to consider whether the 10% diagonal search radius for indeterminate wells was adequate. They were also charged to consider whether considering 90% of the wells in an area from a known aquifer was adequate for application to indeterminate wells.

Issue: Add a data quality flag for default USAs resulting from inadequate or questionable data.

Issue: Technical reviewers should consider whether it is OK that if an AAWS does exist for a WHPA/SWPA then that source should fall off of the candidate USA list.

Issue: The final maps should differentiate between surface and groundwater sources.

Issue: One issue noted is the maintainability of USA maps, correlated to the insertion of new wells. It was noted that this should be addressed by the updating of state databases, in accordance with EPA requirements.

Issue: Regarding Louisiana, the 300 foot cutoff to delineate class I and III wells for most aquifers should be 1000 feet.

Christina Sames provided the following charge to the technical reviewers:

Consider this [breakout] discussion and provide your comments within 3 weeks to develop the final definition/model. Especially, the state reviewers should provide specific comments regarding your suggested changes and why. Also, provide comments regarding the issue noted above, regarding the change, for conservatism, to default a candidate site to becoming a USA instead of dropping from the list if no answer was provided for the AAWS question.

Breakout Session: Ecological USAs

Michael Macrander (Equilon) briefed the reviewers regarding the considerations that went into incorporating ecological resources into the model and the pilot programs. He introduced the core group for this effort as including Scott Zeingel (RPI), Dennis Murphy (University of Nevada - Reno), and Bonnie Freeman (MSG Environmental Consulting). He noted that the guiding principles pre-dated the focus on drinking water and ecological systems and provided the foundation for the work that was done in both areas.

It is important to remember that the intent is to provide extra protection to unusually sensitive resources in the form of additional spill prevention and response measures. Other controls, particularly those afforded under the Endangered Species Act and the Marine Mammal Protection Act, will continue to exist as before. Other rules are pending that will make use of the definition of a USA.

ESI maps were the point of departure for mapping USAs. They are not yet available universally in digital format and are not available for interior non-waterway areas. (The maps were developed to be used in oil spill response). All of the species listed on the ESI maps are considered in the model.

The model does not differentiate between threatened and endangered species. Critically imperiled and imperiled (as characterized in national heritage program databases) are treated differently. (Terms are defined in the methodology document).

Species listed as G-2 (imperiled) are not automatically protected. They are considered in defining multi-species protection areas (MSPA) and would be afforded USA protection in every instance in which they contribute to a MSPA.

Nesting and foraging locations for migratory species are included in the model to the extent captured by heritage program or other data sources.

A buffer for aquatic species was applied to all waterways within a five-mile radius of point source locations. This was done due to a lack of data at the same scale (1:100,000) as used for the base maps. Newer data sources that allow upstream/downstream determination are becoming available. These sources are not yet available on a national scale and were not used in developing USAs for the pilots. Such sources may be used in the future to limit buffers to downstream directions.

Michael referred reviewers to Chapter 6 of *Precious Heritage*, published by the Nature Conservancy, for an excellent treatment of how to focus attention on ecological resources of most concern. The methodology is very similar to the treatment described in that reference.

Bonnie Freeman provided a demonstration of the development of ecological USAs using the maps. Overlays were used to describe the process by which information was considered in arriving at final USA maps. The flow chart provided in reviewer's materials was also used. Bonnie pointed out that the model for each state includes five miles of data from adjacent states, in order to assure proper generation of USAs on state borders.

Questions, Comments, and Issues identified by the reviewers included the following:

Comment: State species listings were not used.

Response: Bruce Stein (Nature Conservancy) pointed out that many/most California state-listed species are also nationally listed. The situation is different in some states, however, where state listings reflect the edge of a species' range. National rankings were used to assure uniform treatment.

Question: Does the proposed rule specify a periodicity for updating USA maps?

Response: No. Updates are intended, but how often they will be performed has not been decided. One year seems too frequent. Ten is probably too seldom. Five may be appropriate.

Updates are needed to reflect changes in the abundance of resources, and also changes in our state of knowledge.

Issue: Periodicity of map updates should be a consideration for the rule. Consideration should be given to both: 1. Incorporating changes to source information (i.e., implementation of the definition), and 2. Incorporating new data sources (i.e., re-visiting the definition itself).

Comment: The number of species used to define a MSPA might need to vary by Region. Three may be appropriate to California, but may never occur in some areas of the Midwest. There was concern that the California experience was driving the definition. The existence of imperiled species in California is highly unusual. (In response, it was noted that the definition was developed before it was applied in the California pilot). Bonnie Freeman reported that review of the pilot data indicate that using 2 vs 3 unique species would have approximately doubled the total area included as USAs in LA. The effect in TX would probably be similar. There would have been little effect in CA.

Comment: Bio-diversity may not be consistent nationally.

Issue: The number of species contributing to MSPAs may need to vary regionally.

Comment: The Texas results appear to indicate that the filtering criteria are overly specific. It appears that treatment of all the candidate USAs in Texas as USAs would not be unduly burdensome.

Question: Why aren't endangered species listing used instead of critically imperiled (the latter being global as opposed to national)?

Response: A G-1 designation means less than 5 populations. Affecting one of them therefore potentially affects 20 percent of the world population. That makes it particularly sensitive. Many US endangered species are also G-1, but not all. Some are listed as endangered because the population is declining even though it is still rather plentiful.

Comment: More and more listed species have defined critical habitats. Should this model capture that data source?

Comment: Inconsistencies exist between state heritage programs in the definition of polygon data that may make it appropriate to revert to point data for now.

Response: Bruce Stein suggested that polygons should be used where they are available, but that he would sacrifice those polygons that are simply habitat in favor of known occurrences of species that may be below G-1.

Comment: Rookeries of importance in Louisiana are not captured due to how they are listed. None include G-1 species.

Response: Scott Zeingel pointed out that LA has several sites that would qualify for WHSRN status, and thus have been included, but that no site is now listed.

Comment: Breeding sites could be important in identifying USAs.

Response: Michael Macrander noted that this issue had been considered. WHSRN and Ramsar were the only programs providing any priority ranking of such sites. He would support consideration of any other programs that may be developed. Bruce Stein agreed that he supports the concept of a national ranking scheme, but does not see one available in the near term.

Comment: There may be a need to consider critical eco-systems. There is a need for a national database.

Response: Bruce Stein pointed out that a structure exists within the national heritage program, but that it has not been implemented in most states.

Issue: The definition is now data-limited (factors are not in the model if no data source exists). OPS should consider listing "unusual" characteristics, regardless of data availability, as a means to influence future data development/mapping.

Comment: There may be a need for formal consultation with the Fish and Wildlife Service.

Issue: Possible need to protect the recharge area for caves, etc. in order to provide adequate protection for troglodytic species.

Issue: Data augmentation could be focused in the near term on current pipeline rights of way (it was noted that this would challenge a guiding principle).

Issue: There is a need for a mechanism to foster inter-agency cooperation (augmenting biological data are not a particular expertise of DOT of the pipeline industry).

The ecological reviewers asked for the following information to be provided to them to support their review:

1. Percentage of targets (G-1, G-2, federally listed) captured (by species and occurrence)
2. Comparative statistics for the pilot states using 2 vs. 3 species in defining MSPAs
3. Percentage of occurrences captured for each target (G-2, listed)