REVIEW OF API/OPS USA PILOT TEST

1. As discussed in the meeting, the Source Water Protection Areas (SWPAs) of the EPA/States national Source Water Assessment Program (SWAP) need to be incorporated into the Drinking Water Resources Filtering Criteria of the API/OPS USA model. This is based on the fact that Wellhead Protection Areas (WHPAs) of the Wellhead Protection Program (WHPP), also an EPA/States national program, are already part of the filtering criteria. The former is derived from the Safe Drinking Water Act Amendments of 1996 and the latter from the Safe Drinking Water Act Amendments of 1986. The former was not an established program at the time the filtering criteria were established in 1996.

2. The two programs track one another, therefore if one is a filtering criteria, then the other has to be a filtering criteria. The SWAP delineates drinking water protection areas around wells the same way that the WHHP does.

3. Both programs are ongoing programs. Although all delineations and assessments for water systems nationwide must be completed by May 2003, results are released to EPA and the public as the programs are completed. We get calls from pipeline companies now on a steady basis with regard to where current WHPAs are. These calls are in connection with the Oil Pollution Act of 1990.

CONCLUSION

DRINKING WATER RESOURCES

Filtering Criteria:

- TNCWS intakes are not USAs.

- CWS & NTNCWS intakes are USAs, if they get their water from a surface source & do not have an adequate alternative source of water.

- CWS & NTNCWS WHPAs/**SWPAS** are USAs, if they get their water from a ground water source that's a Class I or Class IIa aquifer & there's not an adequate alternative source of water. If the ground water source is a SSA, the USA is twice the area of the WHPA/**SWPA**.

Note the simple additions in BOLD.

RULES FOR SCREENING DRINKING WATER USAs IN LOUISIANA

Critical data sets provided to Research Planning to aid in developing and applying rules:

1. Louisiana Hydrologic Atlas Map no. 2: Areal Extent of Freshwater in Major Aquifers in Louisiana. This shows subcrop outlines of aquifers as well as outcrops

and indicates where more than one freshwater aquifer may be accessed by the same well.

2. Louisiana Hydrologic Atlas Map No. 3: Altitude of the Base of Freshwater in Louisiana. This map takes the guess work out of how deep fresh water is available when used in conjunction with the previously mentioned Atlas in 1 above. This map helps eliminate the speculation of available fresh water aquifer thickness by Research Planning.

3. Map showing Recharge Potential of Louisiana Aquifers. This map indicates how permeable the soil is at the surface and is an indicator only. Specific information as to whether there is 50' of impermeable clay at the surface is not readily available, and considering the heterogeneity of the deposits in Louisiana it would be speculation to make a general statement with regard to this for each aquifer. The best information available would be an electric log on a well of interest. Again, we want to point out that sediments change rapidly both laterally and vertically in Louisiana due to the shifting rivers that have deposited the sediments.

4. The Louisiana Department of Transportation database on public supply wells which supplies aquifer names and the screened interval. Both are essentially missing from the Department of Health and Hospitals database. Research Planning will try to correlate the two databases and take advantage of the new information.

DISCUSSION BY AQUIFER

1. Wells located within flood plains of the Mississippi, Atchafalaya, and Red Rivers that derive their water from the Quarternary deposits of the Alluvial Aquifer System are Class Id USAs. We agree with this.

2. The Alluvial/Valley Trains Aquifer System is classified as Class Ia or Class Id. We have no problem with these classifications.

3. The Chicot/Terraces Aquifer System needs to be broken down into the Terrace Aquifers and the Chicot Aquifers. We are going to send a shape file to Research Planning that defines the aerial extent of the Terrace Aquifers. These are Pleistocene surficial erosion remnants and have a different origin than the Chicot Aquifer. The Terrace Aquifers have the fastest ground water velocity of any of the freshwater aquifers in Louisiana and are very susceptible to contamination. This is a Class Ia aquifer system.

4. The Chicot Aquifer is a sole source aquifer in southwest Louisiana and is equivalent to what Research Planning has referred to as Permeable Zone A. The following discussion refers specifically to the Chicot Aquifer System as described in a recent United States Geological Survey publication. "Surficial clays in southern Louisiana were once thought to be an impermeable barrier to downward movement of water from the surface. However, faulting and fracturing associated with salt domes and

secondary porosity created by subaerial weathering after deposition have resulted in vertical hydraulic conductivities of the clays that may be several orders of magnitude higher than those measured from core samples in a laboratory (Hanor, 1993). Results of a computer simulation of ground water flow in the Chicot Aquifer System, conducted in the 1980's, indicate that vertical leakage, primarily from the surface, currently (1996) is the largest component of recharge to the aquifer and is occurring throughout southwestern Louisiana (Nyman and others, 1990, p.33).

Also, in the same document referring to the Calcasieu Parish area: "Because water levels in the 500-foot sand are lowest, water moves vertically through confining units from the 200-foot sand and the 700-foot sand towards the 500-foot sand". The contamination by chlorinated solvents of the Chicot Aquifer in the Lake Charles area is in the 200-foot sand. This is currently under remediation, otherwise that contamination probably would have ended up in the 500-foot sand also.

In view of the above discussion, we believe that the Chicot Aquifer should be classified as Ia down to 1000' instead of 300', and Class III below 1000'.

5. The South East Louisiana Aquifer System has fairly deep wells (virtually all screened below 300') after consideration that the Terrace Aquifers should be excluded from this aquifer system as in the previous discussion relative to the Chicot Aquifer System. Although there have been problems with leakage of salt water across a surficial fault in the Baton Rouge area due to heavy pumping, generally speaking this aquifer system is less vulnerable to contamination due to well depths. We believe that the classification as proposed by Research Planning is acceptable for this aquifer system.

6. The Evangeline Aquifer equivalent is part of the South East Louisiana Aquifer System in the southeast part of the state and is discussed in 5 above. Thus, the discussion in 5 applies here. In the southwest part of the state, most of the wells are screened below 300 feet and depth is a favorable factor. However, any well that is in the recharge (outcrop) area of the Evangeline Aquifer and sources that aquifer should classified as Ia down to 1000' and Class III below 1000'. Conditions discussed with regard to the Chicot Aquifer System apply to the Evangeline Aquifer also.

7. The Miocene Aquifers are composed of the Jasper and Catahoula Aquifers. The Jasper Aquifer System is composed of the Williamson Creek and Carnahan Bayou aquifers. Both aquifers are under artesian conditions (confined), except in the recharge area where they may be under water table conditions. This information comes from a United States Geological Survey report, Water –Resources Investigations Report 91-4137, 1992 which discusses the Jasper Aquifer System. Therefore, any well that is in the recharge (outcrop) area of the Jasper Aquifer System should be classified as Ic down to 1000' and Class III below 1000'.

   The same discussion of the Jasper Aquifer System applies to the Catahoula Aquifer except the depth is 500' instead of 1000' based on the Research Planning discussion

of a 500' maximum depth in the outcrop area which is supported by USGS Report 94-4085, 1994. (The maximum depth of fresh water by aquifer referenced at the beginning of this report may refine the depth figure for this aquifer and those discussed below).

8. The same discussion of the Jasper Aquifer System applies to the Cockfield Aquifer except the depth is 600 feet instead of 1000' based on the Research planning discussion of a 600' maximum depth in the outcrop area which is again supported by USGS Report 94-4085, 1994.

9. The Sparta Aquifer is under a great deal of stress. Included is an article that discusses the large cone of depression developed from over-pumping of the aquifer. Thus, the aquifer is drawn down and more susceptible to contamination like the 500' Sand in the Lake Charles area discussed in connection with the Chicot Aquifer above. This in conjunction with the fact that the community of Minden has BTEX contamination to 300' in the Sparta Aquifer causes us to increase the depth of Class Ic in the outcrop area to 500'. This depth is based on an approximate maximum thickness of the Sparta in the outcrop as indicated in the Research Planning report. Again, this figure may be tweaked based on the depth to fresh water map given to ResearchPlanning.

   The Sparta may be overlain by Terrace Aquifers on the order of 250' to 350' and an increase in Sparta thickness below these deposits. Where the combined aquifer thickness' are in excess of 1000', the Class Ic definition should extend to 1000' with Class III below that depth. The Terrace deposits are very permeable sands.

10. Wells sourcing the Carrizo-Wilcox Aquifer System that are located in the outcrop area should be defined as Class Ic to a depth of 850' based on a maximum aquifer thickness (USGS 94-4085, 1994). Again, this figure could be tweaked based on the maximum depth of fresh water referred to above. Wells deeper than 850' would be Class III wells.