Trip Report
New Mexico Study of Field Indicators of Hydric Soils in the United States
6/23 – 6/27/2008

Objective

Lenore Vasilas, NRCS, HQ; Jim Herrington, EPA, TX; Ken Scheffe, NRCS, NM; and Bob Hill, NRCS, NM toured sites throughout New Mexico being monitored by EPA to assess the applicability of Field Indicators of Hydric Soil in the United States to Hydric soils in New Mexico and to identify problematic situations that may occur where current Field Indicators fail. EPA with the assistance of NRCS and the Army Corps of Engineers had previously installed IRIS tubes to evaluate if the areas in question were in fact soils that meet the definition of a hydric soil and go anaerobic in the upper part.

Observations

Summary of Site Visits

Data sheets completed at sites during site visits are attached. All data was collected using protocols spelled out in the Arid West 1987 Corps of Engineers Wetland Delineation Manual Regional Supplement. One IRIS tube was placed at five different locations on a transect moving away from the center of the wetland in mid-April. Some of these tubes were removed during our June site visit. However, it was determined that mid-April probably caught the very end of the "wet" season when water tables are at their highest. So, where no removal of iron or removal of iron only at the very bottom of the tube occurred the IRIS tubes were left in place to be removed sometime next spring. IRIS tubes in the high PH/high salt soils that had iron removed from the tubes had a black coating that replaced the iron in the center of each area of iron removal.

Fig. 1. Map of Sites.

Monday, 6/23/08

Site 20 Bottomless Lake State Park, Roswell, NM

The site was not disturbed and had normal circumstances. However, the soils were potentially problematic because of high pH, high salt content, high gypsum content strata, and red parent material strata. Vegetation at this site was hydrophytic with 66 percent of the vegetation being facultative (FAC), facultative wet (FACW), or obligate wet (OBL) using the dominance test for analysis. On our site visit on June 23, 2008 the only hydrology indicator present was the primary indicator salt crust (B11). An IRIS tube at the wettest site monitored had removal of at least 30 percent of the iron paint starting in the upper 6 inches of the surface. Although the technical standard requires that 5 tubes be used and 3 of the 5 tubes must meet the criteria to prove anaerobic conditions in the upper part, the fact that this was one of the few tubes that had 30 percent removal leads me to believe that the soil does go anaerobic in the upper part and is a hydric soil. The next site on the transect appeared to be close to the boundary of the hydric soil. The IRIS tube had some removal of iron, but not 30 percent. Since the tubes were most likely not placed on the site at the appropriate time, this result is inconclusive. The other 3 sites on the transect were most likely not hydric soils and had no removal of iron on the upper part of the IRIS tubes. All five IRIS tubes were pulled from this site.

The soil at the wettest point on the transect had a surface 2 inches thick with a color of value 3 and chroma of 1. Below that was a 2 inch layer of a matrix chroma of 7.5YR 5/4 with 30 percent 7.5YR 2.5/2 organic stained material and 5 percent 7.5YR 8/2 salt. The second layer was a layer containing what is thought to be red parent material. From 4 to 8 inches the soil was a 10YR 5/2 with no redox features. At 8 to 16 inches+ the soil was a mixed matrix of 10YR 6/3 and 7/3 with 10 percent redox concentrations of 7.5YR 5/6. The last layer described was high in gypsum. Vegetation, landscape position, and IRIS tube results indicate that this is likely a hydric soil. However, it does not currently meet any Field Indicators of Hydric Soils in the United States. This site also does not meet an original 1987 Corps of Engineers Wetland Delineation Manual field indicator for hydric soils.

Fig. 2. The picture on the left is at the lowest point on the transect where the IRIS tube met the technical standard criteria. The picture on the right is at the highest point on the transect where no iron was removed from the upper part of the IRIS tube.

Site 19 Bitter Lakes, Roswell, NM

The site was not disturbed and had normal circumstances. However, the soils were potentially problematic because of high pH, high salt content, and high gypsum content. The soil may have also contained problematic red parent material. The wetter area adjacent to the wettest monitoring site had no vegetation due to the high salt content. Vegetation at this site was hydrophytic with 66 percent of the vegetation being FAC, FACW, or OBL using the dominance test for analysis. On our site visit on June 23, 2008

the only hydrology indicator present was the primary indicator salt crust (B11). Significant removal in the upper part of IRIS tubes did not occur, so the tubes were left in to be removed after the start of the next “wet” season. At this time, it appears to me that the soils monitored on the transect out of the wetland were not hydric soils. However, the IRIS tube results may show otherwise.

The soil at the wettest point monitored 1 inch of a 7.5YR 2.5/1. At 1 to 2 inches it was a 10YR 5/2 with no redox; 2 to 6 inches was 5YR 5/4; 6 to 8 was a 10YR 6/2 and 10YR 5/3 mixed matrix with the 10YR 5/3 being gypsum; and 8 to 16 inches was 7.5YR 4/2 with 10 percent faint 7.5YR 4/3 redox concentrations as soft masses. This soil does not meet Field Indicator of Hydric Soils in the United States. It is closed to meeting F3. Depleted Matrix with the depleted matrix starting at 8 inches. However, the redox concentrations are faint and, therefore, do not count. This soil also does not meet an old 1987 Corps of Engineers Wetland Delineation Manual field indicator of hydric soils.

Fig. 3. The picture on the left is at the lowest point on the transect and the picture on the right is at the highest point on the landscape.

Site 18 Bitter Lakes, Roswell, NM

We visited a second site at Bitter Lake, but the consensus was that none of the sites monitored was actually a hydric soil and where the site was wet enough for hydric soil development the site was so high in salt that vegetation did not grow. No data was collected at this site, but the IRIS tubes were left in to see if our conclusions were valid.

Fig. 4. The profile on the left is from the lowest point on the transect and the profile on the right is from the highest point on the transect.

Tuesday, 6/24/08

Site 16 Mesilla Valley, Las Cruces, NM

This site was adjacent to what appears to be a dug pond. The site itself was not disturbed, normal circumstances existed, and the soils did not appear to be problematic. The vegetation at the wettest point on the transect was hydrophytic with 100 percent of the vegetation being FAC, FACW, or OBL. There were no wetland hydrology indicators present during out site visit on June 24th, however, in April when the IRIS tubes were placed at the site they had direct observation of saturation in the upper part of the soil. IRIS tubes did not have significant removal of iron on the upper part of the tube. The tubes were left in place to be removed after the start of the next "wet" season.

The soil at the wettest point on the transect had 0 to 8 inches was 7.5YR 4/3 with no redox concentrations and 8 to 24 inches of 7.5YR 4/2 with 10 percent 7.5YR 4/6 redox concentrations and 2 percent 7.5YR 4/1 redox depletions. The 8 to 24 inch layer meets the definition of a depleted matrix. However, 8 inches of a chroma higher than 2 above the depleted matrix precludes the soil from meeting any of the Field Indicators of Hydric Soils in the United States. This soil does, however, meet and old 1987 Corps of Engineers Wetland Delineation Manual field indicator of hydric soils. The local soil scientists did not think that the parent material at this site was problematic red parent material. The consensus at the site was that the wettest site was very close to the hydric soil boundary

and was probably just outside the line. The next IRIS tube on the transect had a cactus growing next to it. However, removal of the IRIS tubes in the spring may tell us something different. Additional IRIS tubes were placed in soils thought to be on the hydric soil side of the line.

Fig. 5. The soil profile on the left is at the lowest point on the transect. It has a depleted matrix starting at 8 inches, but does not meet the depleted matrix indicator due to the 8 inches above the depleted matrix being all high chroma. The profile on the right is at a point on the transect that is definitely not wet.

A second site in Mesilla Valley was visited, but it was decided that the soils at this site were not hydric. However, IRIS tubes were left in to confirm that conclusion.

Wednesday, 6/25/08

Site 100 Bosquecito, Socorro, NM

This site was not disturbed and normal circumstances existed. There had been a fire that affected this area within the last five years and burnt cottonwood trees were present. Within the last year, a brush chipper had been brought in to remove a dense stand of salt cedar. The affects of the fire may have had an affect on hydrology. The soils were potentially problematic due to high pH and/or high salt content. It had a hydrophytic vegetative community. No wetland hydrology indicators were present at the time of observation. The water table was at 24 inches.

The soil at the wettest point on the transect had a 0 to 7 inch 5YR 4/4 silty clay loam surface. The next horizon was a 5YR 4/3 clay loam. At 10 inches the soil was a 5YR 3/2 with 15 percent prominent redox concentrations. The IRIS tubes at this site did not have significant iron removal in the upper part. The IRIS tubes were left in to be pulled after the next “wet” season. The soil at this site did not meet a Field Indicator of Hydric Soils in the United States. It did, however, meet the old 1987 Corps of Engineers Wetland Delineation Manual hydric soils indicator gleyed or low chroma colors if you interpret the first two horizons as A horizons. It meets the indicator because of the chroma of 2 with redox concentrations at 10 inches. Consensus was that the site may be slightly drier than what is needed for a hydric soil to develop.

We did look at the soils in a groundwater discharge seep at the base of the slope feeding water into the broad flood plain. The site had hydrophytic vegetation and appeared to stay wet for significant periods of time. The site was not wet at the time of observation. The soils did not meet any Field Indicators of Hydric Soils in the United States or 1987 Manual Indicators. An IRIS tube was installed in this area to be removed after the next “wet” season to determine if these soils are in fact problematic. The soil were very red in color with hues of 5YR, but the local soil scientists did not believe that these were soils derived for “red” parent material (crystalline red shale). It is thought that the issue in these soils is the pH and/or salinity.

Fig. 6. Two soil profiles along the transect at Bosquecito. None of the soils along this transect met Field Indicators of Hydric Soils. However, soil observed in an area that appeared to be a groundwater discharge wetland also did not meet Field Indicators.

Site 10 La Joya, Socorro, NM

This site was not disturbed and normal circumstances existed. The soils were potential problematic due to high pH and/or high salinity. It had 100 percent FAC, FACW or OBL vegetation and met the primary wetland hydrology indicator oxidized rhizospheres. The IRIS tubes at the site did not have significant iron removal in the upper part and were left in place to be removed at the end of the next "wet" season. The group thought that this point on the transect was wet but the IRIS tubes were put in place too late in the "wet" season to capture the anaerobic conditions in the upper part.

The soils at the wettest point on the transect had a surface horizon from 0 to 2 inched with a mixed matrix of 10YR 4/1 and 10YR 3/2 clay loam. The next horizon was 2 to 7 inches of a 2.5Y 5/1 with 15 percent prominent redox concentrations. The third horizon from 7 to 13 inches was a 10YR 5/3 with 25 percent redox concentrations. This site met the field indicator F3 Depleted Matrix with the depleted matrix occurring at 2 to 7 inches. This soil does not meet an old 1987 Manual indicator because the matrix color is a 3 chroma immediately below the A horizon. The next point higher in the landscape on the transect had 3 chroma matrices in the upper part and, therefore, did not meet any hydric soils field indicators. This point appeared to be slightly too high on the landscape to be a wetland. It appeared to the group that Field Indicators of Hydric Soils of the United States were working at this site.

Fig. 7. The soil profile on the left was in an upland area. The soil profile on the right was a hydric soil meeting the Field Indicator F3. Depleted Matrix.

6/26/08.

Site 11 San Geronimo, Socorro, NM

This site was not disturbed and normal circumstances existed. The soils were potentially problematic due to high pH and/or salinity. The vegetative community was 100 percent FAC, FACW, and OBL. It met the primary wetland hydrology indicator salt crust. The IRIS tubes did not have significant iron removal in the upper part. IRIS tubes were left in place to be removed after the next “wet” season.

The soils at the wettest point on the transect had a surface horizon from 0 to 0.24 inches of 10YR 8/3 salt crust. From 0.25 to 4 inches was a 10YR 4/3 clay loam. And, from 4 to 13 inches was a 7.5YR 4/2 with common prominent redox concentrations. This soil met the Field Indicator F3 Depleted Matrix and also met the 1987 Manual indicator gleyed or low chroma colors. Other points on the transect did not meet hydric soil indicators and were not thought to be in wetlands. This site did not appear to be problematic.

Fig. 8. The soil profile on the left is of a hydric soil meeting the Field Indicator F3. Depleted Matrix. The soil on the right is from a higher landscape position.

Site 2 Leonora Curtin, Santa Fe, NM

This site did not appear to be problematic; however the wettest site did not meet a Field Indicator of Hydric Soils in the United States. The site contained many small areas of ground water discharge seeps with fingers of uplands in between. All the IRIS tubes were placed in the uplands between the discharge areas and did not have significant iron removal in the upper part. A soil description was taken in the upland and about 10 feet away in a small groundwater discharge wetland. The wetland had hydrophytic vegetation and was saturated to the surface. However, the hydric soil did not meet a Field Indicator of Hydric Soils in the United States. The soil was very dark in color and high in organic matter indicating that they were wet, but was not dark enough to meet F12 Thick Dark Surface, was too thick to meet A11 Depleted Below Dark Surface, and lacked the redox features to meet F6 Redox Dark Surface. The soil did meet a 1987 Manual hydric soils indicator. We are seeing a similar problem with thick dark soils in the Great Plains Mollisols. Further work may be needed to fill in gaps between the dark surface Field Indicators.

Fig. 9. The soil profile on the right was taken in a groundwater discharge seep that stays wet for most of the year. The soil profile on the right was taken about less than 20 feet away outside of the discharge area. Although the soil in the seep is very dark in color it did not meet a Field Indicator because it was to dark to meet F3. Depleted Matrix, did not have the redox features to meet F6. Redox Dark Surface, and the dark surface was not thick enough to meet A12. Thick Dark Surface and was too thick to meet A11. Depleted Below Dark Surface.

Conclusions

It does appear that some of the soils at sites monitored in New Mexico are problematic in that they do not exhibit the characteristic soil morphologies that are associated with hydric soils. The problematic situations in most cases seem to be due to high pH and/or high salinity. The Bottomless Lake State Park site and the Bosquecito site were the best examples of this situation. However, the Bottomless Lake site also had problematic red parent material and high amounts of gypsum in the soil as well. The Bosquecito site had very red soils, but it was thought that the parent material was not the problematic "red" parent material with the iron being in a crystalline form. Further investigation is needed to develop field indicators of hydric soils in these high pH/high salinity sites.

There was also a wetland point at the Leonora Curtin Wetland that did not meet a Field Indicator of Hydric Soils in the United States. The situation at the Leonora Curtin Wetland is not unusual or unique to the Arid West and further data needs to be collected in these dark surface situations to fill in the gaps between the dark surface indicators F6 Redox Dark Surface, A11, Depleted Below Dark Surface, and A12 Thick Dark Surface. However, this situation usually occurs in very wet soils where the hydrology is very evident and in many case as you move toward the edge of the wetland you will encounter one of the common dark surface indicators. Further investigation needs to be done in thick dark surface soils to fill in the gaps between dark surface indicators.

The Bitter Lakes Sites did not appear to be hydric soils. If the IRIS tubes are pulled after the next "wet" season, no further investigation is needed in these areas. The wetter part of the landscape at the two Bitter Lakes sites were so high in salinity that they had no vegetation and, therefore, would not be considered wetlands because of the lack of vegetation.

The Mesilla Valley sites did not appear to be wet. The transect at site 17 appeared to start its wettest point very close to the hydric soil boundary. The IRIS tube did not have significant paint removal in the upper part. The soil did meet an old 1987 Manual hydric soil indicator, but did not meet a Field Indicator of Hydric Soils in the United States due to more than 6 inches of a chroma higher than 2 occurring above the depleted matrix. Otherwise, it would have met F3 Depleted Matrix. Site 16 did not appear to be wet anywhere in the vicinity of the transect. Unless the IRIS tubes that are pulled at the end of the next "wet" season show that the soils go anaerobic in the upper part, no further investigation needs to be done at the Mesilla Valley sites.

At the La Joya and San Geronimo sites the Field Indicators of Hydric Soils in the United States appeared to be working based on landscape position and other indicators of wetness. Where the group thought the point was in a wetland the soils met Field Indicators of Hydric Soils in the United States. Where the group thought the points were in uplands, the soil did not meet any hydric soils indicators. The La Joya wetland, however, did not meet an old 1987 Manual hydric soil indicator. Unless the IRIS tubes pulled after the next "wet" season give us results that conflict with our initial findings, no further investigation needs to be done at these sites.

Future Needs

EPA may be interested in funding a project for data collection on problematic hydric soils in New Mexico. The data collected thus far on these sites indicates that the most significant problem situation in these areas are in soil affected by high pH/high salinity. Problematic parent materials in New Mexico include parent materials with high gypsum and “red” parent material. Sites that represent the problematic situations in New Mexico are the Bottomless Lakes State Park site and the Bosquecito site. The National Technical Committee for Hydric Soils is planning to hold their next meeting in New Mexico to provide further information and advice on these issues. It would be helpful if they could visit both the Bottomless Lake site and the Bosquecito site. Unfortunately, the sites are not close.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Bottomless Lakes State Park City/County: Chaves Sampling Date: 6-23-2008

Applicant/Owner: New Mexico Park & Recreation State: NM Sampling Point: 20-1

Investigator(s): Herrington, Hill, Scheffe, Vasilas Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Alluvial flat Local relief (concave, convex, none): slightly convex Slope (%): 0-1%

Subregion (LRR): D Lat: 33° 19.052 Long: 104° 20.181 Datum: _____

Soil Map Unit Name: Hp – Holliman-Gypsum land complex 0-3% NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? No Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? Yes (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No _____	**Is the Sampled Area within a Wetland?** Yes _____ No _____
Hydric Soil Present?	Yes _____ No _____	
Wetland Hydrology Present?	Yes _____ No _____	

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. Tamarix chinensis	20%	Y	NI
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1. Sporobolus airoides	40%	Y	FAC
2. Distichlis spicata	20%	Y	FACW
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover: 80%			
Woody Vine Stratum			
1.			
2.			
Total Cover: 85%			

% Bare Ground in Herb Stratum 15% % Cover of Biotic Crust 5%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

Saltcedar / alkali sacaton alluvial flat.

SOIL

Sampling Point: 20-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2"	10YR 3/1	100%					loam	
2-4"	7.5YR 5/4	65%	7.5YR 2.5/2	30%				
			7.5YR 8/2	5%				
			10YR 5/3-Rubbed					
4-8"	10YR 5/2							
7-16"	10YR 6/3	50%						
	7/3	50%	7.5YR 5/6	10%				

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No _____

Remarks:

~30% reduction on Fristubes. -Left tube in to measure high water table.
*Doesn't meet any listed hydric indicator for manual or supplement.
Observed red parent material, high pH, high salt, and high gypsum (CA 504)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ✓ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): _____

Water Table Present? Yes ✓ No ___ Depth (inches): 25"

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 16"

Wetland Hydrology Present? Yes _____ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Salt crust present.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Bitter Lakes #(Site 19) City/County: Chaves Sampling Date: 6-23-2008

Applicant/Owner: ~~[redacted]~~ U.S. Fish + Wildlife Service State: NM Sampling Point: 19-1

Investigator(s): Hess, Hill, Vasilas, Scheffe Section, Township, Range:

Landform (hillslope, terrace, etc.): Alluvial flat Local relief (concave, convex, none): slightly convex Slope (%): 0-1%

Subregion (LRR): D Lat: 33°25.516 Long: 104°25.005 Datum:

Soil Map Unit Name: Balmorhea NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? No Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? Yes (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No ____	**Is the Sampled Area within a Wetland?** Yes ____ No ____
Hydric Soil Present?	Yes ____ No ____	
Wetland Hydrology Present?	Yes ____ No ____	

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. Tamarix chinensis	30%	Y	NI
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1. Distichlis spicata	20%	Y	FACW
2. Sporobolus airoides	50%	Y	FAC
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover: 90%			
Woody Vine Stratum			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum 5% % Cover of Biotic Crust 5%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks:

Salt-crust

SOIL

Sampling Point: _____

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-1"	7.5YR 2.5/1	100					loam	
1-2"	10YR 5/3	100						
2-6"	5YR 4/4	100						
6-8"	10YR 6/2	60						
	10YR 5/3	40						
8-16"	7.5YR 4/2	100	7.5YR 4/3	100	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No _____

Remarks: Appears to have a depleted matrix at 8" but has faint redox features, therefore does not meet F3. Does not meet 1987 manual.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ✓ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): _____

Water Table Present? Yes ✓ No ___ Depth (inches): 22.5"

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: 16-1 Mesilia Valley City/County: Las Cruces Dona Ana Sampling Date: 6-24-2008

Applicant/Owner: NM Game & Fish State: NM Sampling Point: 16-1

Investigator(s): Ken Scheffe Section, Township, Range:

Landform (hillslope, terrace, etc.): Relic Floodplain Local relief (concave, convex, none): Convex Slope (%): 1

Subregion (LRR): D Lat: 32.24623 Long: 106.82124 Datum:

Soil Map Unit Name: Bg Belen Clay NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? No Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No _____	**Is the Sampled Area within a Wetland?** Yes _____ No _____
Hydric Soil Present?	Yes _____ No _____	
Wetland Hydrology Present?	Yes _____ No _____	

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. ~~Salix goodingii~~	~~5%~~	~~Y~~	~~OBL~~
2.			
3.			
4.			
Total Cover:	5%		
Sapling/Shrub Stratum			
1. Tamarix chinensis	5%	Y	FACW
2.			
3.			
4.			
5.			
Total Cover:	5%		
Herb Stratum			
1. ~~Typha latifolia~~	15	Y	~~OBL~~
2. ~~Eleocharis macrostachya~~	20	Y	~~OBL~~
3. Malvella leprosa	10	N	FACW
4. ~~Schoenoplectus acutus~~	~~15~~	~~Y~~	~~OBL~~
5. ~~Carex emoryi~~	~~15~~	~~Y~~	~~OBL~~
6. Distichlis spicata	20	Y	FACW
7. ~~Paspalum distichum~~	~~5~~	~~N~~	~~OBL~~
8.			
Total Cover:	100		
Woody Vine Stratum			
1. None			
2.			
Total Cover:	0		

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust —

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 12 (A)

Total Number of Dominant Species Across All Strata: 12 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

__ Dominance Test is >50%

__ Prevalence Index is ≤3.0[1]

__ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: 16-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	7.5YR4/3	100					SiC	
8-24	7.5YR4/2	60	7.5[illegible]1				SiC	
			7.5YR 4/1	2%				
			7.5YR 4/6	10%				

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No _____

Remarks:

High chroma too deep to meet F3
Meets 87 Manual

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches): ~~_____~~

Water Table Present? Yes _____ No _____ Depth (inches): 7.25

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): 7.25

Wetland Hydrology Present? Yes _____ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: _____ City/County: Chaves Sampling Date: 10G-W

Applicant/Owner: Bosqueseco State: NM Sampling Point: _____

Investigator(s): Herrington, Valicus, Sabatke Section, Township, Range: _____

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0-1

Subregion (LRR): D Lat: 35° 35.941 Long: 104° 06.274 Datum: _____

Soil Map Unit Name: Typic Ustifluvents, 0-2% slopes NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No _____ Hydric Soil Present? Yes _____ No _____ Wetland Hydrology Present? Yes _____ No _____	**Is the Sampled Area within a Wetland?** Yes _____ No _____

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salt cedar			
2. Wolfberry			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1. Distichlis			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:			
Woody Vine Stratum			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes _____ No _____

Remarks:

depth to groundwater - 24"

SOIL

Sampling Point: _____

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-7	5YR 4/4						sicl	
7-10	5YR 4/3						cl	
10-12	5YR 3/2		5YR 5/6	15			scl	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ✓ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No _____

Remarks:

meets 1987 manual

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches): _____

Water Table Present? Yes _____ No _____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: La Joya #2 City/County: Socorro Sampling Date: 6-25-2008

Applicant/Owner: New Mexico Game + Fish State: _____ Sampling Point: 10-8

Investigator(s): Herr, Hill, Vasilas, Schaffe Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Relict Floodplain Local relief (concave, convex, none): Slightly convex Slope (%): 0-1%

Subregion (LRR): D Lat: 340 20.897 Long: 106° 51.894 Datum: _____

Soil Map Unit Name: Typic Ustifluvents NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? NO Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? Yes (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No _____ Hydric Soil Present? Yes _____ No _____ Wetland Hydrology Present? Yes _____ No _____	**Is the Sampled Area within a Wetland?** Yes _____ No _____	
Remarks:		

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. Juncus ~~effusus~~ arcticus var. mexicanus	85%	Y	OBL
2. Distichlis spicata	10%	N	FACW
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:			
Woody Vine Stratum			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

Site dominated by vigorous stand of Juncus.

SOIL

Sampling Point: _____

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2" A1	10YR 4/1	60					clay loam	1/2" fibric mat
"	10YR 3/2	40						
2-7" B2	2.5YR 5/1	85%	5YR 5/6	5%	C	M		
			7.5YR 5/6	10%	C	M	↓	
7-13" C	10YR 5/3		10YR 4/6	25%	C	M	fs	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No _____

Remarks:

Meets F3 but not S5 because of 3 chroma at 7". Doesn't meet '87 manual because of 3 chroma below A horizon.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ✓ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): _____

Water Table Present? Yes ✓ No 40" Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: La Joya #2 City/County: Socorro Sampling Date: 4-16-2008

Applicant/Owner: New Mexico Game+Fish State: NM Sampling Point: 10-4

Investigator(s): Herr, Hill, Vasilas, Scheffe Section, Township, Range:

Landform (hillslope, terrace, etc.): Alluvial flat Local relief (concave, convex, none): Slightly Convex Slope (%): 0-1%

Subregion (LRR): D Lat: 34° 20.898 Long: -106° 51.914 Datum:

Soil Map Unit Name: Typic Ustifluvents NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? No Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? Yes (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No _____ Hydric Soil Present? Yes _____ No _____ Wetland Hydrology Present? Yes _____ No _____	**Is the Sampled Area within a Wetland?** Yes _____ No _____
Remarks:	

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. Distichlis spicata	50%	Y	FACW
2. Rumex sp.	50%	Y	OBL
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover: 60%			
Woody Vine Stratum			
1.			
2.			
Total Cover: 100%			

% Bare Ground in Herb Stratum 30% % Cover of Biotic Crust 20%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

1/8" thick salt crust on the site.

SOIL

Sampling Point: 10-4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4 11	10YR 4/3	90%	10YR 5/4	10%	C	M	clay loam	salt crust 1/8" thick
4-24 11	10YR 4/3	85%	7.5YR 4/4	10%	C	M	lfs	Common, Distinct
			10YR 3/2	5%	C	M	lfs	Common, faint

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No _____

Remarks: Salt crust present. Chroma of 3 doesn't meet either manual, so Iris tube data will be assessed to determine hydric soils.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ✓ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ✓ Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): _____

Water Table Present? Yes ✓ No 21 Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ✓ No 17 Depth (inches): _____

Wetland Hydrology Present? Yes _____ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Resampled on 6-25-2008 found water table greater than 25". Will use Iris tube data to determine hydric soils.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: San Bernardino City/County: Socorro Sampling Date: 6-26-2008

Applicant/Owner: NM game & fish State: NM Sampling Point: W-1

Investigator(s): Ken Schafe, Bob Hill, Jim Herrington Section, Township, Range: Convex

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): _____ Slope (%): 1

Subregion (LRR): D Lat: 34° 20.061 Long: 106° 52.310 Datum: _____

Soil Map Unit Name: Typic Ustifluvents, 0 to 2 percent slope NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? No Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No _____	**Is the Sampled Area within a Wetland?** Yes _____ No _____
Hydric Soil Present?	Yes _____ No _____	
Wetland Hydrology Present?	Yes _____ No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	—	= Total Cover	
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	—	= Total Cover	
Herb Stratum (Plot size: _____)			
1. Cressa	20	Y	FACW
2. ~~Eriogonum~~ Rumex	10	Y	OBL
3. Saltgrass	40	Y	FACW
4.			
5.			
6.			
7.			
8.			
	70	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	—	= Total Cover	

% Bare Ground in Herb Stratum 30 % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No _____

Remarks:

SOIL

Sampling Point: 11-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4"	7.5YR 3/3	100%					clay	salt crust
4-6"	7.5YR 4/4	100%					↓	
6-15"	7.5YR 4/2	100%	7.5YR 5/6				↓	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No _____

Remarks:

No 87 manual indicator

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ✓ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ✓ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No _____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

>25" - groundwater. Manipulated hydrology. Some spring flow.

193

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: San Geronimo City/County: Socorro Sampling Date: 6-26-2008

Applicant/Owner: NM Fish & Game State: NM Sampling Point: 11-2

Investigator(s): Ken Schaffe, Bob Hill, Jim Herrington Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Convex Slope (%): 1

Subregion (LRR): D Lat: 34°20.068 Long: 106° 52.308 Datum: _____

Soil Map Unit Name: Typic Ustifluvents, 0 to 2 percent slopes NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? No Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No _____ Hydric Soil Present? Yes _____ No _____ Wetland Hydrology Present? Yes _____ No _____	**Is the Sampled Area within a Wetland?** Yes _____ No _____

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. Rumex	10	Y	OBL
2. Cressa	5	Y	FACW
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	15		
Woody Vine Stratum			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes _____ No _____

Remarks:

SOIL

Sampling Point: 11-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0	10YR 8/3						salt crust	
0-4"	10YR 4/3						clay loam	
4-11	7.5YR 4/3						↓	
4-13"	7.5YR 4/2		7.5YR 5/6	20%	C	M	↓	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No _____

Remarks:

Common depletions & common salt crystals in depleted.
No 87 manual indicator

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ✓ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Less than 2% oxidized rhizospheres.
Saturation at 21" ; groundwater > 25"!

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Leonora Curtin Wetland City/County: Santa Fe County Sampling Date: 6/26

Applicant/Owner: Santa Fe Botanical Garden State: NM Sampling Point: 2-6

Investigator(s): Scheffe, Hill, Herrington, Vasilas Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Sideslope seep Local relief (concave, convex, none): Concave Slope (%): 3

Subregion (LRR): D Lat: 35° 33.914 Long: 106° 06.274 Datum: _____

Soil Map Unit Name: RZ Cuyamungo-Riverwash complex, 0 to 2%, flooded NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? No Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No _____	**Is the Sampled Area within a Wetland?** Yes _____ No _____
Hydric Soil Present?	Yes _____ No _____	
Wetland Hydrology Present?	Yes _____ No _____	

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. Helianthus ciliaris	5		FAC
2. Equisetum laevigatum	10		FACW
3. Juncus Mexicana	15		OBL
4. Solidago canadensis	5		FACW
5.			
6.			
7.			
8.			
Total Cover:	35		
Woody Vine Stratum			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

SOIL

Sampling Point: 2-6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6"	10YR 2/2	100					loam	
6-12"	10YR 4/3	25%					sandy loam	
	10YR 3/2	75%	5YR 4/6	3%				
12"-15"	10YR 3/1	80%	7.5YR 4/4 4/6	20%			sandy clay	
			7.5YR 2.5/3	Root fibers				

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No _____

Remarks:

NIM

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ✓ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ✓ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches): _____

Water Table Present? Yes _____ No _____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

New point. 2-9 – WP 104

18-3

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Leonora Curtin Wetland City/County: Santa Fe County Sampling Date: 6/26
Applicant/Owner: Santa Fe Botanical Garden State: NM Sampling Point: 2-5
Investigator(s): Ken Scheffe, Bob Hill, Jim Herring Section, Township, Range:
Landform (hillslope, terrace, etc.): Hillside Seep Local relief (concave, convex, none): convex Slope (%): 3
Subregion (LRR): D Lat: 35° 33.973 Long: -106° 06.335 Datum:
Soil Map Unit Name: 122 Cuyamungue-Rivoverde complex, 0 to 2% slopes NWI classification: Riverine
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? No Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No ____	**Is the Sampled Area within a Wetland?** Yes ____ No ____
Hydric Soil Present?	Yes ____ No ____	
Wetland Hydrology Present?	Yes ____ No ____	

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum			
1. Juncus Mexicanus	20	OBL	
2. Solidago Canadensis	15	FACW	
3. Equisetum Laevigatum	5	FACW	
4. Potentilla anserica	10	OBL	
5.			
6.			
7.			
8.			
Total Cover:	50%		
Woody Vine Stratum			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum ____ % Cover of Biotic Crust ____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 66% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:
___ Dominance Test is >50%
___ Prevalence Index is ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes X No ____

Remarks:

SOIL

Sampling Point: 2-5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6" A	7.5YR 4/2	100%					loam	
6-10" C	7.5YR 5/3	100%	5YR 4/6	15	C	M	sandy clay loam	
10-15"+ C	7.5YR 4/2	100%	7.5YR 4/6				loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No _____

Remarks:

Meets F3 but not 1987 because 3 chroma below A.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ✓ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Thin Muck Surface (C7)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✓ Shallow Aquitard (D3)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches): _____

Water Table Present? Yes _____ No _____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): 24+

Groundwater = 28 6/26/2008

Wetland Hydrology Present? Yes _____ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Waypoint 102 – New Iris Tube location

N 35° 33.973

W 106° 06.335