STATE GUIDANCE for WETLAND DETERMINATIONS INCLUDING OFFSITE METHODS HELPFUL HINTS

NOTE 1: South Dakota is separated into 2 major United States Army Corps of Engineers (USACE) Regional Supplement areas – Great Plains and Midwest.

Midwest USACE Regional Supplement counties in SD are:

Brookings	Lincoln	Deuel	Roberts
Lake	Codington	Moody	Hamlin
Clay	Minnehaha	Grant	Union

All other counties (except MLRA 62) are within the Great Plains Regional Supplement.

NOTE 2: SD codified law (Chapter 49-7A) describes the One Call notification system for excavation activities. SD law requires notification to the SD One Call System if you plan to conduct a site investigation which involves digging or auguring (with hand or mechanic equipment) below 18 inches on agriculture land.

NOTE 3: For typical situations, sample soils no deeper than 48 inches from the soil surface. If the soil is dark colored to more than a depth of 48 inches, move closer to the edge of the depression until the dark soil is less than 48 inches thick. If the edge of the depression has a hydric soil indicator, all lower elevations within the depression are hydric soils. This note does not apply to "Atypical" soils situations.

NOTE 4: Helpful Munsell Soil Help Charts for a quick guide to common indicators is provided in Attachment A of this document.

NOTE 5: Consult local weather websites and use your local experience to determine if normal hydrological conditions exist. A website that could be used to determine "observed, normal, departure from normal and percent of normal precipitation" is: http://water.weather.gov/precip/.
Once you are at this website follow these instructions:

1. Select the Timeframe (1) you wish to review. If you select "today" then you will only be able to review the "observed" product. If you select any prior data then you will be able to review all products.

2. Select the Product (2) you wish to review (Observed, Normal, Departure from Normal, or Percent of Normal).

3. Select the Location (3) you wish to review (South Dakota) and zoom in as necessary.

4. You can print and save the product map and save the website as a bookmark.

If normal environmental conditions do not exist (i.e. dryer or wetter than the normal wet portion of the growing season) then the presence or absence of indicators should be tempered with the fact that site conditions at the time of sampling might not be reflective of what would occur during periods of normal hydrological conditions.

ATTACHMENT A

MUNSELL SOIL HELP CHARTS

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Munsell Soil Help Charts

In general, start with Soil Color Chart pages 10YR, 2.5Y, and 5Y.
10YR is used in the examples below

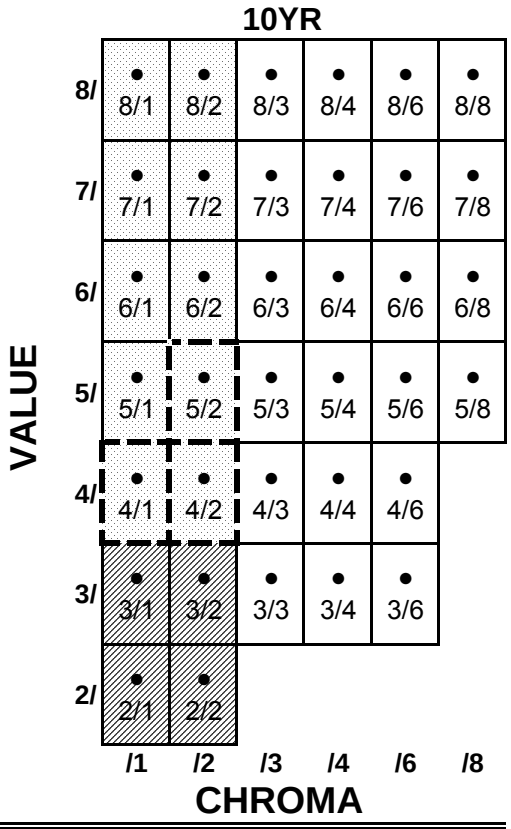
A11: Depleted Below Dark Surface

Upper layer above depleted matrix has a value ≤3 and chroma ≤2 (≤1 for sandy soils).

AND

Starting within 12 inches of the surface, a layer at least 6 inches thick with a depleted "grayer" color of value ≥4 and chroma ≤2.

IF the soil color in the depleted layer are 4/1, 4/2, or 5/2 then redox concentrations are required.



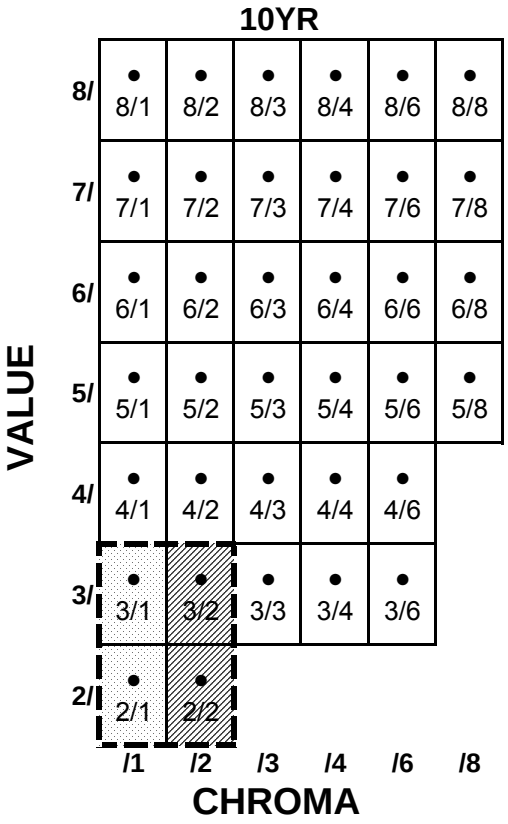
F6: Redox Dark Surface

Entirely within 12 inches of the surface there is a layer of value ≤3 and chroma ≤2 at least 4 inches thick with redox concentrations.

AND

2% or more redox concentrations if value ≤3 and chroma ≤1.

5% or more redox concentrations if value ≤3 and chroma ≤2.



Munsell Soil Help Charts

In general, start with Soil Color Chart pages 10YR, 2.5Y, and 5Y.
10YR is used in the examples below

A12: Thick Dark Surface

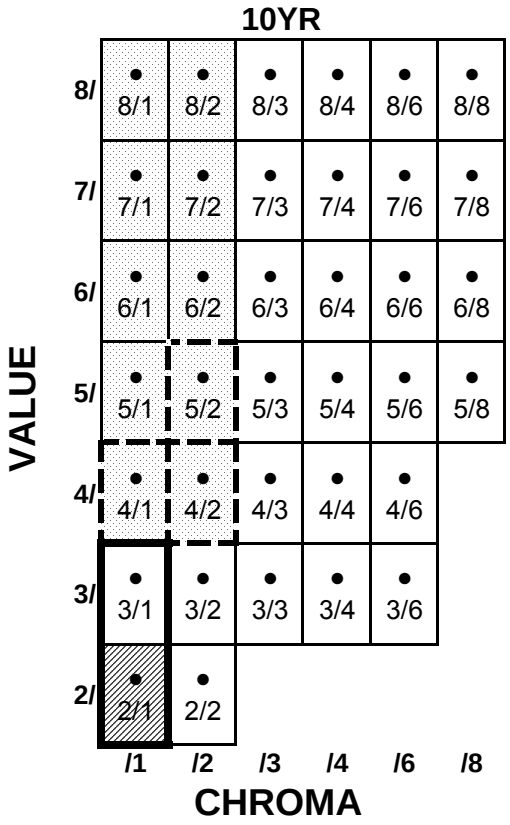
Upper 12 inches has value ≤2.5 and chroma ≤1.

AND

A layer at least 6 inch thick with depleted "greyer" color of value ≥4 and chroma of ≤2 starting anywhere 12 inches below the surface.

IF the soil color in the depleted layer are 4/1, 4/2, or 5/2 then redox concentrations are required.

Any layer between the two (surface & depleted layer) has value ≤3 and chroma ≤1.



ATTACHMENT B

HYDROLOGY INDICATOR CAUTIONS AND USERS NOTES

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Great Plains Regional Supplement Hydrology Indicators

Indicator ID	Indicator Name	Primary	Secondary	Can this indicator be used on altered sites?	Is this indicator only used during the growing season?
A1	Surface Water (Inundation)	X		Yes	No
A2	High water table	X		Yes	No
A3	Saturation	X		Yes	No
B1	Water Marks	X		Yes	No
B2	Sediment Deposits	X		Yes	No
B3	Drift Deposits (lines)	X		Yes	No
B4	Algal mat or crust	X		Yes	No
B5	Iron deposits	X		Yes	No
B6	Surface soil cracks		X	**No, see notes**	No
B7	Inundation visible on aerial imagery	X		Yes	No
B8	Sparsely vegetated concave surface		X	Yes	**Yes**
B9	Water-stained Leaves	X		Yes	No
B10	Drainage Patterns		X	Yes	No
B11	Salt crusts	X		Yes	No
B13	Aquatic fauna	X		Yes	No
C1	Hydrogen sulfide odor	X		Yes	No
C2	Dry-season water table	X		**No, see notes**	**Yes**
C3	Oxidized Root Channels	X (untilled)	X (tilled)	Yes	No
C4	Presence of reduced iron	X		Yes	No
C7	Thin muck surface	X		Yes	No
C8	Crayfish burrows		X	Yes	No
C9	Saturation visible on aerial imagery		X	Yes	No
D2	Geomorphic position		X	**No, see notes**	No
D5	FAC-neutral Test		X	Yes	No
D7	Frost-heave hummocks		X	Yes	No

Midwest Regional Supplement Hydrology Indicators

Indicator ID	Indicator Name	Primary	Secondary	Can this indicator be used on altered sites?	Is this indicator only used during the growing season?
A1	Surface Water (Inundation)	X		Yes	No
A2	High water table	X		Yes	No
A3	Saturation	X		Yes	No
B1	Water Marks	X		Yes	No
B2	Sediment Deposits	X		Yes	No
B3	Drift Deposits (lines)	X		Yes	No
B4	Algal mat or crust	X		Yes	No
B5	Iron deposits	X		Yes	No
B6	Surface soil cracks		X	**No, see notes**	No
B7	Inundation visible on aerial imagery	X		Yes	No
B8	Sparsely vegetated concave surface	X		Yes	**Yes**
B9	Water-stained Leaves	X		Yes	No
B10	Drainage Patterns		X	Yes	No
B13	Aquatic fauna	X		Yes	No
B14	True Aquatic plants	X		Yes	No
C1	Hydrogen sulfide odor	X		Yes	No
C2	Dry-season water table		X	**No, see notes**	**Yes**
C3	Oxidized Root Channels	X		Yes	No
C4	Presence of reduced iron	X		Yes	No
C6	Recent iron reduction in tilled soils	X		Yes	No
C7	Thin muck surface	X		Yes	No
C8	Crayfish burrows		X	Yes	No
C9	Saturation visible on aerial imagery		X	Yes	No
D1	Stunted or Stressed Plants		X	Yes	No
D2	Geomorphic position		X	**No, see notes**	No
D5	FAC-neutral Test		X	Yes	No
D9	Gauge or well data	X		Yes	No

B4: Algal mat or crust

General Description: This indicator consists of a mat or dried crust of algae, perhaps mixed with other detritus, left on or near the soil surface after dewatering.

Figure 29. Dried algal deposit clinging to low vegetation.

Figure 30. Dried crust of blue-green algae on the soil surface.

Cautions and User Notes: Algal deposits include those produced by green algae (Chlorophyta) and blue-green algae (cyanobacteria). They may be attached to low vegetation or other fixed objects, or may cover the soil surface (Figure 29). Dried crusts of blue-green algae may crack and curl at plate margins (Figure 30). Algal deposits are usually seen in seasonally ponded areas, lake fringes, and low-gradient stream margins. They reflect prolonged wet conditions sufficient for algal growth and development.

B4: Algal mat or crust continued

B6: Surface soil cracks

NEW Secondary – GP & MW

General Description: Surface soil cracks consist of shallow cracks that form when fine-grained mineral or organic sediments dry and shrink, often creating a network of cracks or small polygons (Figure 37).

Cautions and User Notes: Surface soil cracks are often seen in fine sediments and in areas where water has ponded long enough to destroy surface soil structure in depressions, lake fringes, and floodplains. Use caution, however, as they may also occur in temporary ponds and puddles in non-wetlands; these situations are easily distinguished by the absence of hydrophytic vegetation and/or hydric soils. **DO NOT USE in areas that have been effectively drained ALTERED TO THE BOTTOM).** This indicator does not include deep cracks due to shrink-swell action in clay soils (e.g., Vertisols).

Figure 37. Surface soil cracks in a seasonally ponded depression.

C2: Dry-season Water Table

NEW **Primary– GP** **Secondary - MW**

General Description: Visual observation of the water table between 12 and 24 in. (30 and 60 cm) below the surface during the normal dry season or during a drier-than-normal year.

Cautions and User Notes: Due to normal seasonal fluctuations, water tables in wetlands often drop below 12 in. during the summer dry season. A water table between 12 and 24 in. during the dry season, or during an unusually dry year, indicates a normal wet-season water table within 12 in. of the surface. Sufficient time must be allowed for water to drain into a newly dug hole and to stabilize at the water-table level. The required time will vary depending upon soil texture. In some cases, the water table can be determined by examining the wall of the soil pit and identifying the upper level at which water is seeping into the pit. For an accurate determination of the water-table level, the soil pit, auger hole, or well should not penetrate any restrictive soil layer capable of perching water near the surface. Water tables in wetlands often drop well below 24 in. during dry periods. Therefore, a dry-season water table below 24 in. does not necessarily indicate a lack of wetland hydrology.

SD will use July and August as dry-season months; users will not need to calculate dry-season dates or determine drought periods.

This indicator does not apply in agricultural areas that have controlled drainage structures for subsurface irrigation.

D2: Geomorphic Position

NEW Secondary– GP & MW

General Description: This indicator is present if the area in question is located in a localized depression, linear drainageway, concave position within a floodplain, at the toe of a slope, on the low-elevation fringe of a pond or other water body, or in an area where groundwater discharges.

Cautions and User Notes: Excess water from precipitation and snowmelt naturally accumulates in certain geomorphic positions in the landscape, particularly in low-lying areas such as depressions, drainageways, toe slopes, and fringes of water bodies. These areas often, but not always, exhibit wetland hydrology. This indicator does not include concave positions on rapidly permeable soils (e.g., floodplains with sand and gravel substrates) that do not have wetland hydrology unless the water table is near the surface.

DO NOT USE this indicator in areas with functioning drainage systems (ALTERED TO THE BOTTOM in depressions and any drainage in linear systems).

Indicator D5: FAC-neutral test

Category: Secondary

General Description: The plant community passes the FAC-neutral test.

Cautions and User Notes: The FAC-neutral test is performed by compiling a list of dominant plant species across all strata in the community, and dropping from the list any species with a Facultative indicator status (i.e., FAC, FAC–, and FAC+). The FAC-neutral test is met if more than 50 percent of the remaining dominant species are rated FACW and/or OBL. This indicator can be used in communities that contain no FAC dominants. If there are an equal number of dominants that are OBL and FACW versus FACU and UPL, non-dominant species should be considered.

This indicator is only applicable to wetland hydrology determinations.

FAC-neutral test may be used on altered sites using on-site vegetation.

Growing Season

Beginning and ending dates of the growing season may be needed to evaluate certain wetland indicators, such as visual observations of flooding, ponding, or shallow water tables on potential wetland sites.

Growing Season. In the absence of site-specific information, growing season dates may be estimated by using WETS tables to determine the median dates of 28 °F (-2.2 °C) air temperatures in spring and fall based on long-term records gathered at the nearest appropriate National Weather Service meteorological station. However, if practical, growing season in a given year should be determined through on-site observation of biological activity, including (1) growth and activity in vascular plants and (2) soil temperature (see Chapter 4).

The end of the growing season is indicated when woody deciduous species lose their leaves and/or the last herbaceous plants cease flowering and their leaves become dry or brown, generally in the fall due to cold temperatures or reduced moisture availability. Early plant senescence due to the initiation of the summer dry season in some areas does not necessarily indicate the end of the growing season and alternative procedures (e.g., WETS tables) should be used.

How to Determine the Start of the Growing Season?

- In the absence of site-specific information, use the 28-degree F., 5 years in 10 per WETS tables (no change)
- Observation of the "Green-Up" Criteria (new)
- Measurement of soil temperature at 12 inches is 41 degrees F. or higher (modified)

"Green-Up" Criteria for Start of the Growing Season

1. The growing season has begun on a site in a given year when two or more different non-evergreen vascular plant species growing in the wetland or surrounding areas exhibit one or more of the following indicators of biological activity:

    a. Emergence of herbaceous plants from the ground (protective sheath enclosing shoot tip/embryonic leaves)
    b. Appearance of new growth from vegetative crowns (e.g., in graminoids, bulbs, and corms)
    c. Coleoptile/cotyledon emergence from seed
    d. Bud burst on woody plants (i.e., some green foliage is visible between spreading scales)
    e. Emergence or elongation of leaves of woody plants
    f. Emergence or opening of flowers

Example of Potential Differences in the Start of the Growing Season

- **From WETS table:**
  - **April 29 was 28 degree F., 5 years in 10 date.**
- **From the field:**
  - **Reed canary grass shoots were 4-6 inches in height.**
  - **Sedge (*Carex*) leaves were 4-6 inches in height.**
  - **"Green up" indicator was 1, 2 or 3 weeks earlier than 28 degree F., 5 in 10.**

ATTACHMENT C

WETNESS SIGNATURE EXAMPLES

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Wetness Signature Conditions Helpful Hints

DISCLAIMER: ALL helpful hints and images are examples only, and the wetness signatures (INU and WS) can range from very noticeable and conspicuous to discreet and less noticeable in appearance. This document is a living document and subject to change at any time.

Inundation (INU) - Surface Water:

This commonly shows as black or dark blue color due to total absorption of light. It may show as a white or silvery white due to total direct reflection of light. A large area may show the black merging with the reflection. Surface water may show as a green color tone due to algae or floating plants (especially in mid to late summer). The edge should have an abrupt color or texture change.

Saturation Wetness Signature (WS) Conditions:

1. Hydrophytic Vegetation - A color of green with a mottled appearance. It may be very dark and appear to have a 3 dimensional appearance.

2. Saturated Conditions - This is normally a darker color if due to saturated conditions at or just before the photo date. This would often be a dark brown to black or dark gray. Should be darker than general landscape. Pale green to greenish yellow or white may result from saturated conditions between spring planting and photo date.

3. Flooded or Drowned Out Crops - Color tends to be a pale green to greenish yellow and could grade to the basic soil color. Crops and/or cropping should be visible in and/or around the area.

4. Stressed Crops due to Wetness - Grades to a pale to yellowish green. Severe stress may show white. Crops and/or cropping should be visible in and/or around the area.

Figure 46. Stunted and yellowed corn due to wet spots in an agricultural field.

Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (ERDC/EL TR-10-16).

5. Difference in Vegetation due to Different Planting or Replanting Dates - Abrupt change in color or color texture following tillage lines. Crops and/or cropping should be visible in and/or around the area.

6. Inclusion of Wet Areas as Set-aside or Idled Land - This should be official set aside land and used in states with set aside land only. Other conditions should exist and may or may not be the

entire area.

7. Circular or irregular areas of un-harvested crops within a harvested field - A green area with an abrupt change to the harvested portion of the field.

8. Isolated Areas that are not farmed with the rest of the field - These would be green in the middle of the summer. They would have a texture appearance without tillage or planting lines. The color change would be abrupt. Crops and/or cropping should be visible in and/or around the area.

9. Areas of Greener Vegetation - Appearance is described by condition definition

Manipulation Signature Information:

Manipulation as defined in the NFSAM - Ditch or tile lines visible on photo. These are fairly straight and have smooth curves. They may be dark colored or white depending on conditions. They may have a black center with white edges, or they may have a white center. The color will depend on the depth of the manipulation and the soil color at that depth. Subsoil brought to the surface during tiling operations may show on imagery as a straight, faint line with diffuse edges.

A natural overflow (erosional feature) from a depression may appear similar to a ditch; however, it should be more irregular in pattern and should be narrower than a constructed ditch. Gullies within drainageways and across floodplains should also appear more irregular than constructed ditches.

A natural overflow may follow tillage furrows and give the appearance of a ditch due to the straight pattern. Observing multiple years of imagery should clarify whether the line is a ditch or simply water following a furrow or existing a natural overflow.

Multiple Saturation wetness signatures (WS)

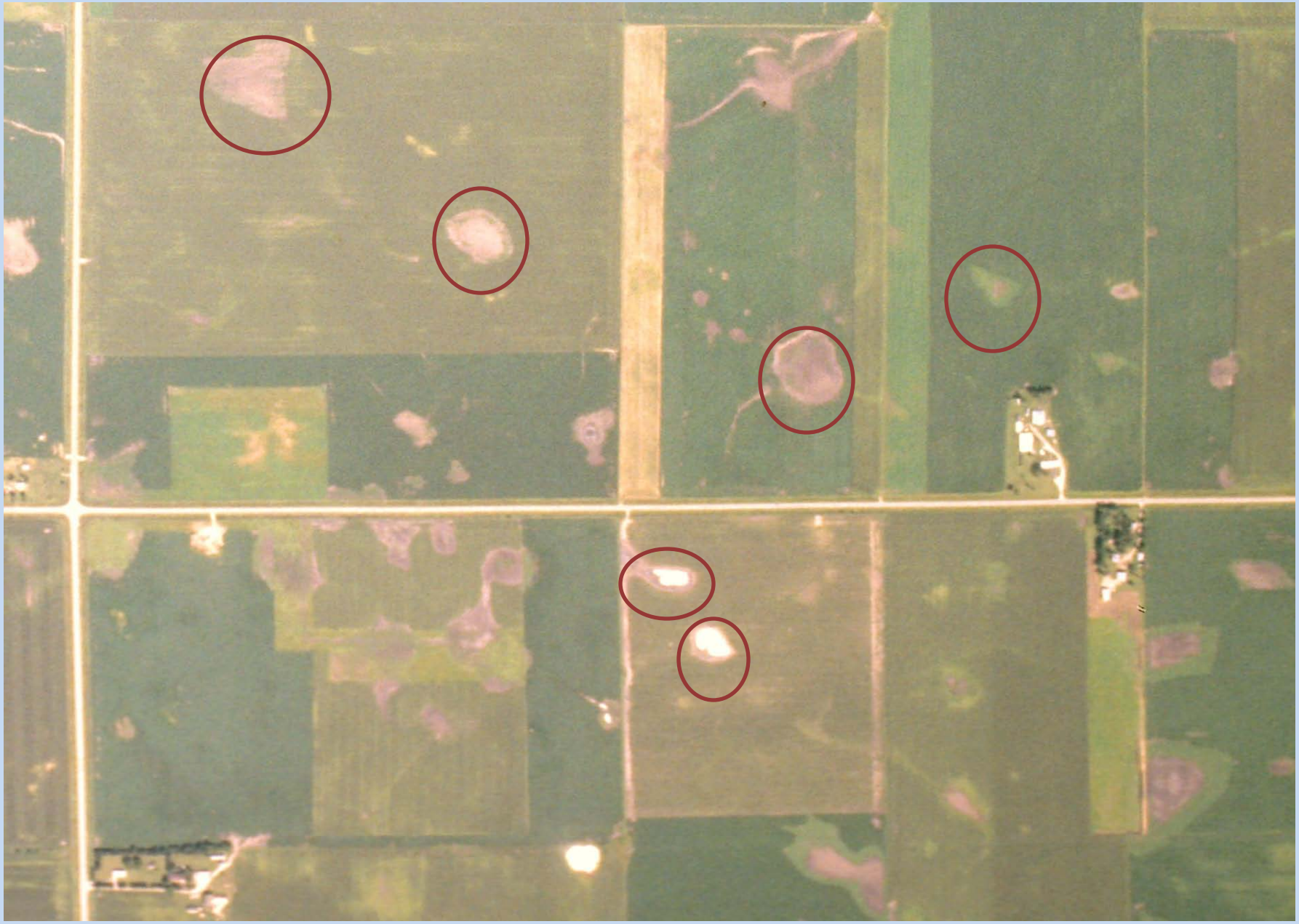
Multiple Saturation wetness signatures (WS)

Inundation wetness signatures (INU) and Saturation wetness signatures (WS)

Multiple Saturation wetness signatures (WS)

Multiple Saturation wetness signatures (WS)

Multiple Saturation wetness signatures (WS)



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