215 South Cascade Street
PO Box 496
Fergus Falls, Minnesota 56538-0496
218 739-8200
www.otpco.com

July 31, 2019

Steve Kahl
Executive Secretary
North Dakota Public Service Commission
600 East Boulevard, Dept. 408
Bismarck, North Dakota 58505-0480

Re: Certification Provision No. 38 and Memorandum Regarding Site Plan Modifications
Merricourt Wind Project
Case Nos. PU-08-932 and PU-19-144

Dear Mr. Kahl:

In accordance with Certification Provision No. 38 associated with the November 16, 2017 Order in PU-08-932, enclosed for filing are an Affidavit of Bradley E. Tollerson and a Memorandum regarding site plan modifications (along with attachments to the Memorandum).

Since issuance of the Commission's November 16, 2017 order, minor changes have been made to the Merricourt Wind Project site plan. These minor changes are detailed Mr. Tollerson's affidavit and accompanying Memorandum.

Thank you for your attention to this matter. Please feel free to call me at (218) 739-8922 if you have any questions or concerns.

Sincerely,

Mark B. Bring
Director of Legislative Affairs and
Associate General Counsel

Enclosures
cc: Jerry Lein
Chris Sternhagen
Sara Bergan
Brad Tollerson
Harvey McMahon

An Equal Opportunity Employer

23 PU-19-144 Filed 07/31/2019 Pages: 89
Affidavit and Memorandum regarding site plan modification with attachments
Otter Tail Power Company
Mark Bring

245 PU-08-932 Filed 07/31/2019 Pages: 89
Affidavit and Memorandum regarding site plan modification with attachments
Otter Tail Power Company
Mark Bring

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF NORTH DAKOTA

Certification Relating to Modification of Energy Conversion Facility and Site Plan Pursuant to Certification Provision No. 38 for the Merricourt Wind Energy Project	**PU-19-144** **PU-08-932**

AFFIDAVIT OF BRADLEY E. TOLLERSON

Bradley E. Tollerson, under oath, states:

1. I am employed by Otter Tail Power Company ("Otter Tail") as its Vice President, Energy Supply, with the authority to bind Otter Tail in the commitments made herein, and make this affidavit in support of modifications to the energy conversion facility and site plan for the Merricourt Wind Project ("Project").

2. I make this affidavit on the basis of my own personal knowledge and belief as to the matters contained herein.

3. I am familiar with the Commission's Findings of Fact, Conclusions of Law and Order dated June 8, 2011 issuing Certificate of Site Compatibility No. 23, as amended on May 27, 2015 and as amended again on November 16, 2017 issuing the Second Amended Certificate of Site Compatibility No. 23 in docket PU-08-932 (the "Order").

4. On June 26, 2019, the Commission approved the joint application of EDF Renewables Development, Inc. ("EDF") and Otter Tail to transfer the Second Amended Certificate of Site Compatibility No. 23 from EDF to Otter Tail and issued First Reissued Second Amended Certificate of Site Compatibility No. 23 (the "Certificate") to Otter Tail.

5. Otter Tail acquired the Project on July 16, 2019 from EDF Renewables Development, Inc. and its affiliates ("EDF"), including EDF-RE US Development, LLC ("EDF-USD"), pursuant to an Asset Purchase Agreement executed by the parties November 16, 2016 and amended on June 11, 2019. A notice to proceed was then issued by Otter Tail to EDF-USD, directing EDF-USD to commence work under a Turnkey Engineering, Procurement and Construction Services Agreement also executed by the parties November 16, 2016 and amended on June 11, 2019.

6. Since issuance of the Order, minor changes have been made to the energy conversion facility and site plan, including switching four alternate turbines to primary turbines and four primary turbines to alternates, as well as

adjustments to collection and roads to accommodate these changes, landowner requests, or to otherwise ensure compliance with the Certificate and/or other internal best management practices. In accordance with Certification Provision No. 38(A), these changes and the accompanying analysis are more particularly described in the Memorandum Regarding Merricourt Energy Conversion Facility and Site Plan Modifications attached as Appendix A (the "Memorandum").

7. A textual summary and visual depiction comparing the energy conversion facility and site plan as approved by the Commission in the Order to the current Project plan are attached as Attachments 1 and 2, respectively, to the Memorandum.

8. In accordance with the Order's fourth ordering clause, an updated Class III cultural resource survey is attached to the Memorandum as Attachment 4, has been provided to SHPO and SHPO's response will be filed with the Commission upon receipt. Construction will not commence within the 50-foot avoidance buffer of the sites for which SHPO concurrence is pending until SHPO's response has been filed with the Commission.

9. In accordance with the Order's fifth ordering clause, an updated wetland determination for any previously un-surveyed areas is included as Attachment 5 to the Memorandum.

10. In accordance with the Order's sixth and seventh ordering clauses, updated acoustic and shadow flicker analysis reflecting the modified energy conversion facility and site plan is included as Attachment 3 to the Memorandum.

11. Except as previously approved or authorized by the Certificate and in accordance with Certification Provision No. 38(A)(1), Otter Tail affirms that construction activities associated with the Project modifications will not affect any known exclusion or avoidance areas.

12. In accordance with Certification Provision No. 38(A)(2), a map and GIS shapefiles meeting the requirements of N.D. Admin. Code § 69-06-04-01(2)(n) of the energy conversion facility and site plan modifications will be separately provided to the Commission by KLJ.

13. In accordance with Certification Provision No. 38(A)(3), Otter Tail affirms that it will comply with the Commission's Order, law and rules designating the site.

Dated this 31st day of July, 2019.

Bradley E. Tollerson

Subscribed and sworn to before me
This 31st day of July, 2019.

Notary Public
My Commission Expires: 1/31/20

DEBORAH A. KLEVEN
Notary Public-Minnesota
My Commission Expires Jan 31, 2020

APPENDIX A TO AFFIDAVIT OF BRADLEY E. TOLLERSON

Memorandum Regarding Merricourt Energy Conversion Facility and Site Plan Modifications

Case Numbers PU-08-932; PU-19-144

I. Background.

The Merricourt Wind Project is a planned 150 MW wind energy generation facility located in McIntosh and Dickey Counties that will include 75 2.0 MW Vestas V110 wind turbine generators and associated infrastructure (the "Merricourt Project"). On June 8, 2011, the Commission adopted Findings of Fact, Conclusions of Law and Order issuing Certificate of Site Compatibility No. 23, as amended on May 27, 2015 and as amended again on November 16, 2017 issuing the Second Amended Certificate of Site Compatibility No. 23 (the "Certificate"). On June 26, 2019, the Commission approved the joint application of EDF Renewables Development, Inc. ("EDF") and Otter Tail Power Company ("OTP") to transfer the Certificate from EDF to OTP and issued the First Reissued Second Amended Certificate of Site Compatibility No. 23 to OTP. On July 16, 2019, OTP acquired the Merricourt Project from EDF and its affiliates, including EDF-RE US Development, LLC ("EDF-USD"). Following OTP's acquisition of the Merricourt Project, OTP and EDF-USD are entering the construction phase with EDF-USD serving as contractor to OTP.

In accordance with Certification Provision No. 38(A), OTP is providing this memorandum to describe minor changes that have been made to the energy conversion facility and site plan since issuance of the Second Amended Findings of Fact, Conclusions of Law and Order and Certificate on November 16, 2017.

II. Description of Modifications.

EDF has determined that a few minor site plan modifications are necessary. While a more complete list is included in Attachment 1 – Summary of Updated Site Plan Modifications, the key changes include switching four alternate turbines to primary turbines and four primary turbines to alternates, moving two turbines seven and ten feet to ensure there is a ten foot buffer to the required setbacks, and moving some collection and roads to accommodate these changes, landowner requests, or to otherwise ensure compliance with the Certificate and/or other internal best management practices. The modifications are visually depicted in the Updated Site Plan included as Attachment 2.

The following certification and supporting documentation are provided in accordance with Certification Provision 38(A):

Attachment 1 - Summary of Updated Site Plan Modifications
Attachment 2 - Updated Site Plan

Attachment 3 - Revised Acoustic and Shadow Flicker Assessments
Attachment 4 - Archaeological and Cultural Addendum Survey Report Summary
Attachment 5 - Update to March 2017 Aquatic Resources Delineation Report

III. Supporting Analysis.

1. **Summary (Attachment 1).** The summary includes a detailed list of the minor shifts to the site plan, most of which are switching primary and alternate turbines and the collection system to accommodate these changes. Two turbines were also shifted a few feet to accommodate OTP and EDF's agreement to include an additional ten-foot buffer to the setbacks otherwise required by law.

2. **Updated Site Plan (Attachment 2).** The site plan modifications are depicted in the Updated Site Plan attached hereto. Maps and GIS shapefiles of the site modifications consistent with Provision No. 38(A)(2) have been separately provided by EDF.

3. **Revised Acoustic and Shadow Flicker Assessments (Attachment 3).** The updated acoustic and shadow flicker results continue to show that all receptors remain under the applicable thresholds of 50 dBA (Noise) and 30 shadow flicker hours per year. The highest modeled noise level for any occupied residence is now 49.5 dBA and the highest modeled shadow flicker hours per year for any occupied residence is 25.1. In each case the residence is a participating landowner.

4. **Archaeological and Cultural Addendum Survey Report Summary (Attachment 4).** EDF contracted with KLJ to conduct an additional Class III Cultural Resource Survey for new access road and corridor expansions associated with revised layout v94. The attached addendum supplements continuous inventories in the project area between 2009 and 2017. No new cultural resources were identified, but four previously noted features were newly recorded as archaeological sites and two previously identified cultural heritage locations were updated. All six previously noted cultural resources will be subject to a 50-foot avoidance buffer for ground disturbing activities. Due to the terrain and other limiting factors, there is one instance in which a collection line would cross the 50-foot avoidance buffer. A directional bore, with an archaeological monitor present, would be utilized to avoid the sites and their associated buffers. The six aforementioned sites and directional bore are depicted in *Figure 21* of the *Archaeological and Cultural Addendum Survey Report*. The Archaeological and Cultural Addendum Survey Report Summary has been provided to SHPO and SHPO's response will be filed with the Commission upon receipt. No construction activities will commence within the 50-foot avoidance buffer of the sites for which SHPO concurrence is pending until such concurrence has been filed with the Commission. If for any reason SHPO does not concur with the avoidance approach for the sites, the area to the east of the sites has been surveyed, is clear, and the collection line could be rerouted, and an appropriate site plan modification filing made with the Commission at that time.

5. **Update to March 2017 Aquatic Resources Delineation Report (Attachment 5).** EDF commissioned a supplemental field delineation on July 2 and 11, 2019 to

identify wetlands on 39 previously un-surveyed acres. Two new wetlands totaling 1.14 acres were delineated in the vicinity of the revised layout. The minor shifts in the site plan will not result in new permanent impacts to wetlands and all temporary impacts to wetlands will be consistent with the First Reissued Second Amended Certificate of Site Compatibility No. 23 which requires that all wetlands under easement to the USFWS be avoided and all other wetlands be avoided or minimized to the extent practicable.

IV. **Conclusion.**

The Project site plan modifications are consistent with the Commission's Order and will not otherwise affect any known exclusion or avoidance areas.

Attachment 1 – Summary of Updated Site Plan Modifications

Turbines

- Turbine 19: Moved 10 ft south to add 10 ft buffer of non-participating land setback
- Turbine 63: Moved 7 ft east to add 10 ft buffer of road setback
- Turbines 12, 13, 33, 44 switched from primary to alternate
    - 12: To mitigate mineral rights concern
    - 13: To mitigate mineral rights concern
    - 33: To mitigate Geotech concern
    - 44: To mitigate landowner issue
- Turbines 77, 78, 80, 81 switched from alternate to primary to replace above swaps

Access Roads

- Updated primary/alternate status of roads based on the above-referenced turbine swaps
- Removed duplicative alternate access roads for turbines that had more than one road option
- Re-routed road to T1 and T2 per landowner request
- Minor adjustment to road near T14 per landowner request
- Re-routed road to T15 per landowner request
- Re-routed road to T17 and T18 per landowner request
- Re-routed road to T22 and T23 per landowner request
- Re-routed road to T73 and T74 per landowner request
- Added road between T35 and T24/T25 in order to make the road east of T81 a temporary construction road rather than a permanent road per landowner request
- Adjusted route of temporary road east of T81 in order to avoid wetland
- Re-routed road to T26 to avoid wetland
- Shifted road to T32 to the west in order to add a continuation to the proposed met tower
- Adjusted road between T36 and T37 for constructability
- Adjusted road to T40 to be outside the three-mile plover buffer (per Bird Bat Conservation Strategy, or BBCS)
- Added roads to the 2 permanent met towers
- Removed roads to previously proposed permanent met towers
- Adjusted road near T61 for constructability/direct route to turbine
- Changed the status of the road east of T81 from Primary to Temporary, as that will be used as a haul route during construction and then reclaimed.
- Adjusted road between T48 and T49 to avoid wetland in response to USFWS comment
- Adjusted roads between T59, T61, and T62 to avoid wetland in response to USFWS comment

Collection

- Updated routing to take into account primary/alternate turbine updates
- Minor adjustment in collection near T15 to shorten length of cable
- Minor adjustment in collection near T16 and T17 for constructability
- Updated routing near T22 in order to balance the feeders due to primary/alternate swaps
- Shifted collection to T26 for constructability/to follow access road

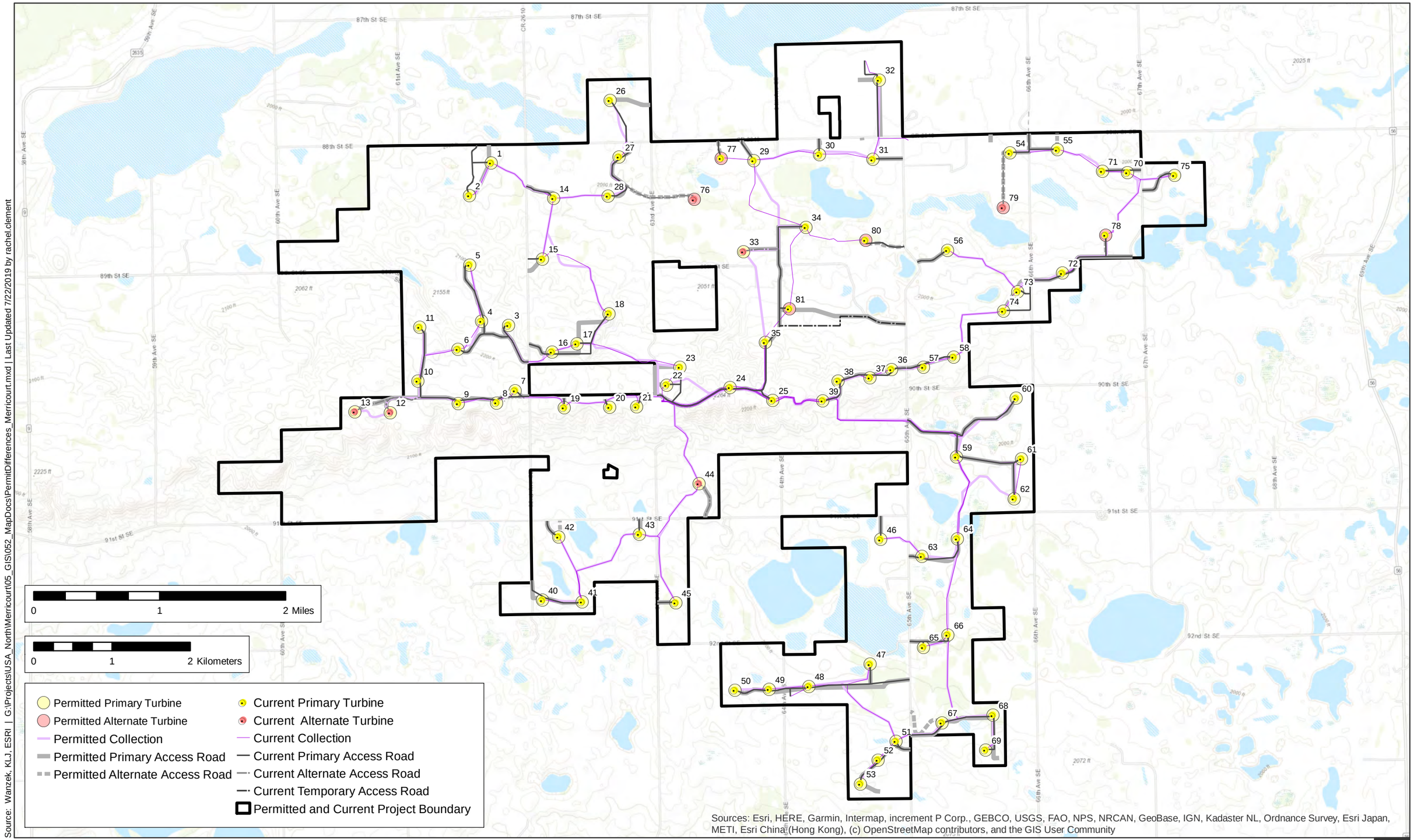
- Updated routing near T29, T33, T34, T35, T77, T80, T81 to account for primary/alternate swaps and ensure balanced feeders
- Minor adjustment near T47/T48/T50 for constructability/to follow access road
- Minor adjustment to T60 for constructability/to follow access road
- Re-route of collection between T59 and T61 for constructability/to follow access road

Substation/O&M

- No changes

Attachment 2 – Updated Site Plan

ATTACHMENT 2



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Source: Wanzek, KLJ, ESRI | G:\Projects\USA_North\Merricourt\05_GIS\052_MapDocs\PermitDifferences_Merricourt.mxd | Last Updated 7/22/2019 by rachel.clement

edf renewables

UPDATES TO THE PERMITTED LAYOUT

Merricourt Wind Project I McIntosh & Dickey Counties, North Dakota

F-1

Attachment 3 – Revised Acoustic and Shadow Flicker Assessments

ATTACHMENT 3

Noise modeling results at Merricourt for Layout v94 (V110-2.0)
Coordinates reported in UTM datum NAD83 Zone 14

Receptor ID	Easting [m]	Northing [m]	Noise [dBA]	Distance to Nearest Turbine [ft]	Nearest Turbine	Receptor Participation Status
26	497902	5102858	49.5	1531	47	Participating
9	500078	5108882	48.4	2158	78	Participating
21	497769	5104152	47.8	2010	46	Participating
17	493288	5105817	46.8	2711	19	Non-participating
15	495120	5108250	46.8	3112	33	Non-participating
8	498719	5109392	46.4	2537	79	Participating
6	497191	5110317	46.4	2115	30	Non-participating
22	495757	5105037	46.0	1942	44	Participating
5	498297	5110117	45.6	2316	32	Non-participating
14	500243	5106870	44.7	2711	60	Non-participating
7	493436	5110465	43.9	3084	26	Non-participating
23	492488	5104255	42.3	3019	40	Non-participating
16	490284	5105421	39.0	4384	13	Participating
27	500571	5102128	38.6	4932	68	Non-participating
10	503221	5109799	35.5	5639	75	Non-participating
18	502098	5105119	35.5	8651	61	Non-participating
24	490239	5103986	34.6	8727	13	Non-participating
25	489541	5104486	33.9	8299	13	Participating
2	493612	5112879	33.7	8392	26	Non-participating
34	497559	5099194	33.4	8069	53	Non-participating
46	488897	5108717	33.4	10078	13	Non-participating
1	493771	5113185	32.8	9228	26	Non-participating
3	494257	5113407	32.3	9750	26	Non-participating
33	501205	5100191	31.6	9431	69	Non-participating
4	495901	5113848	31.4	12259	26	Non-participating
32	501751	5100252	30.4	10747	69	Non-participating
42	497919	5097919	29.0	12354	53	Non-participating
35	501220	5098859	28.3	12729	69	Non-participating
28	504260	5102971	27.3	16969	68	Non-participating
13	506005	5107911	25.9	15309	75	Non-participating
41	496475	5096801	25.3	16198	53	Non-participating
12	506625	5109337	23.9	16608	75	Non-participating
20	505904	5103621	23.6	21891	62	Non-participating
29	506768	5102402	20.4	25128	68	Non-participating
11	507698	5110376	20.4	20413	75	Non-participating
38	504340	5097824	19.8	22314	69	Non-participating
39	504524	5097792	19.4	22855	69	Non-participating
40	504993	5096786	16.7	26146	69	Non-participating
31	507435	5100145	16.5	28342	69	Non-participating
19	509583	5104876	15.3	30120	75	Non-participating
30	508386	5100217	14.5	31338	68	Non-participating
36	508449	5099327	13.4	32234	69	Non-participating
43	511145	5108851	12.1	31483	75	Non-participating
37	507752	5096650	11.2	33715	69	Non-participating
44	511544	5098216	5.6	43012	69	Non-participating
45	511147	5096893	4.9	43274	69	Non-participating

Shadow flicker modeling results at Merricourt for Layout v94 (V110-2.0)
Results for all receptors with more than one hour of shadow flicker per year.

Receptor ID	Easting [m]	Northing [m]	Shadow flicker hours per year	Distance to Nearest Turbine [ft]	Nearest Turbine	Receptor Participation Status
9	500078	5108882	25.1	2158	78	Participating
8	498719	5109392	22.2	2537	79	Participating
6	497191	5110317	19.1	2115	30	Non-participating
26	497902	5102858	13.4	1531	47	Participating
5	498297	5110117	12.4	2316	32	Non-participating
15	495120	5108250	9.0	3112	33	Non-participating
21	497769	5104152	7.0	2010	46	Participating
14	500243	5106870	4.8	2711	60	Non-participating
23	492488	5104255	4.3	3019	40	Non-participating
7	493436	5110465	4.1	3084	26	Non-participating

Attachment 4 – Archaeological and Cultural Addendum Survey Report Summary

Attachment 5 - Update to March 2017 Aquatic Resources Delineation Report

ATTACHMENT 5

4585 Coleman Street
Bismarck, ND 58503-0431
701 355 8400
KLJENG.COM

Memorandum

Date: 7/12/2019
To: Chris Sternhagen, EDF Renewables
Copy to:
From: Ashley Ross, Environmental Planner
Merricourt Wind Power Project
RE: Aquatic Resource Delineation
Update to March 2017 Report

Remarks

KLJ conducted a supplemental field aquatic resource delineation on July 2 and 11, 2019 for the Merricourt Wind Power Project in accordance with the 1987 United States Army Corps of Engineers (USACE) Wetland Delineation Manual and the USACE March 2010 Regional Supplement: Great Plains Region (Version 2.0). The routine approach with on-site inspection was utilized, including the standard multi-parameter approach (vegetation, hydrology, and soils) for wetland identification. An area is a wetland if hydrophytic vegetation, wetland hydrology, and hydric soils are all present. Sample locations were determined using United States Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) maps along with sites which visually supported a hydrophytic plant community, as well as characteristics of wetland hydrology and hydric soils.

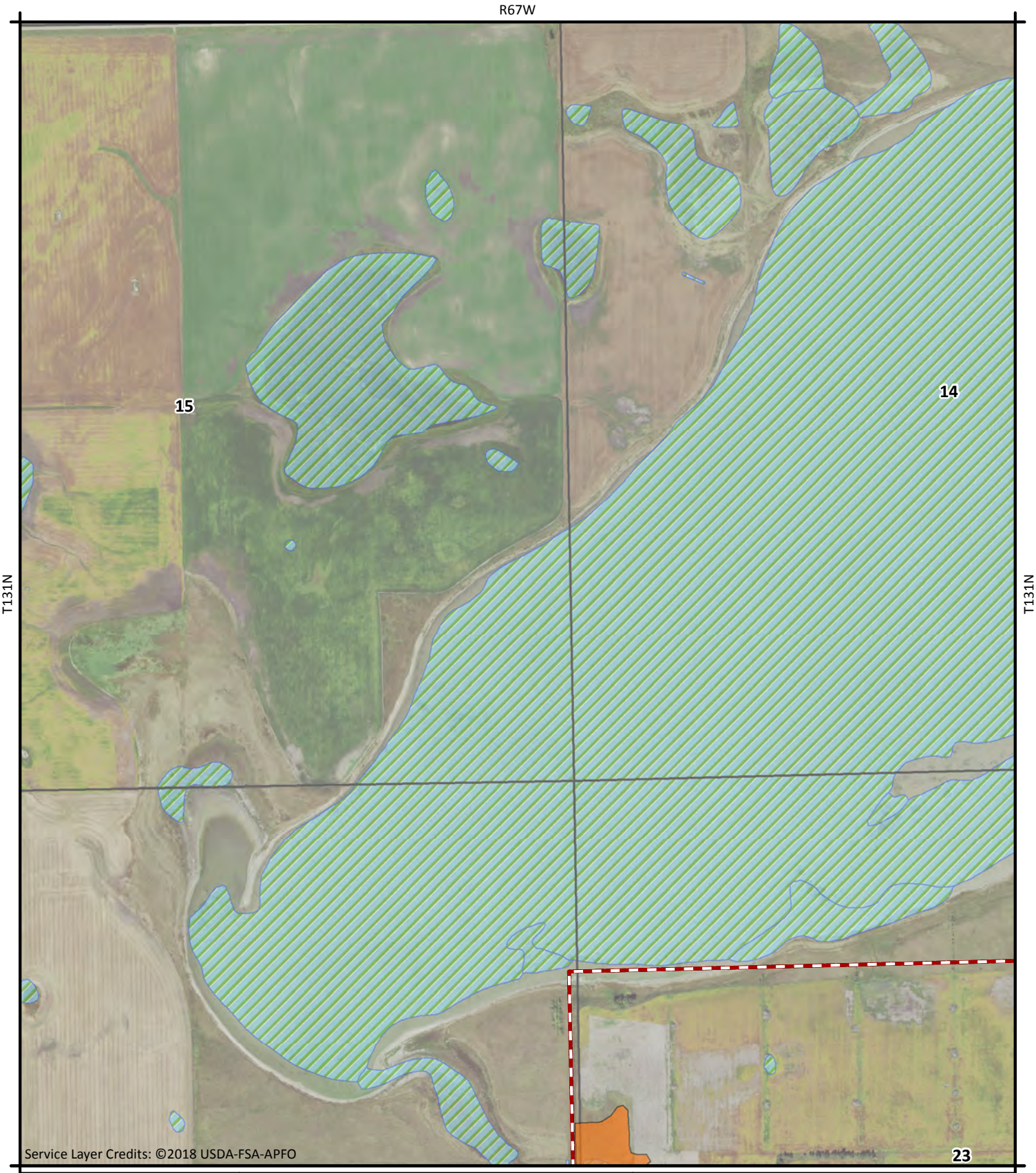
The field aquatic resource delineation study area consisted of 22 parcels, totally approximately 39 acres. Two wetlands were delineated, constituting a total of 1.14 acres. Please refer to the following table for an overview pertaining to the wetlands.

Wetland Number	Latitude/ Longitude	Legal Location	Cowardin Classification	Wetland Type	Wetland Size (Acres)	Wetland Feature
19-1	46.078671°W/ -99.045491°N	Sec. 14 & 15 T130N, R67W	PEMA	Basin	1.09	Natural
19-2	46.127943°W/ -99.043302°N	Sec. 35 T131N, R67W	PEMC	Basin	0.05	Natural

Please refer to the attached on-site photographs, aquatic resource delineation maps, and aquatic resource datasheets. Refer to pages C4 and E4 of the mapbook.

Wetland 19-1, View East

Wetland 19-2, View West



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C1	C2	C3	C4	C5	C6	
D1	D2	D3	D4	D5	D6	
		E3	E4	E5	E6	

KLJ Project Number: 1609132.1	
Date Created: 7/12/2019	Created By: JDP

Merricourt Wind Power Project McIntosh and Dickey Counties North Dakota

Wetland Delineation & USFWS NWI

N W E S

0 300 600 1,200 Feet

1:11,000

- Final Project Boundary
- Wetland Delineation Boundary
- Office Delineated Wetlands
- Previously Delineated Wetlands
- 2016 Field Wetlands
- NWI Wetlands
- Primary Turbine Location
- Alternate Turbine Location
- Met Towers
- Primary Access Road
- Alternate Access Road
- Temporary Access Road
- Collection Lines
- Crane Paths
- Operations and Maintenance

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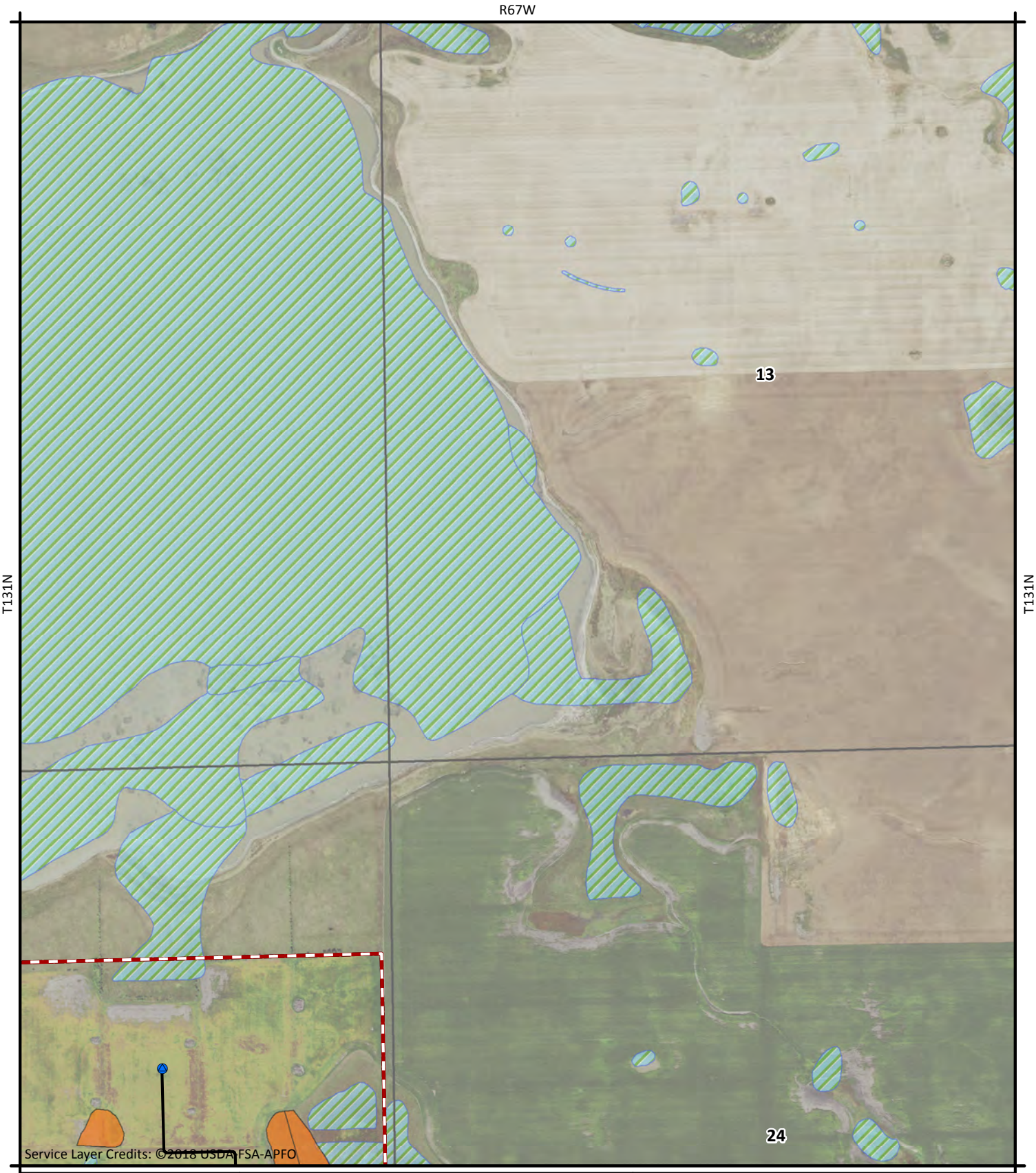

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C1	C2	C3	C4	C5	C6	
D1	D2	D3	D4	D5	D6	
		E3	E4	E5	E6	

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Merricourt Wind Power Project McIntosh and Dickey Counties North Dakota

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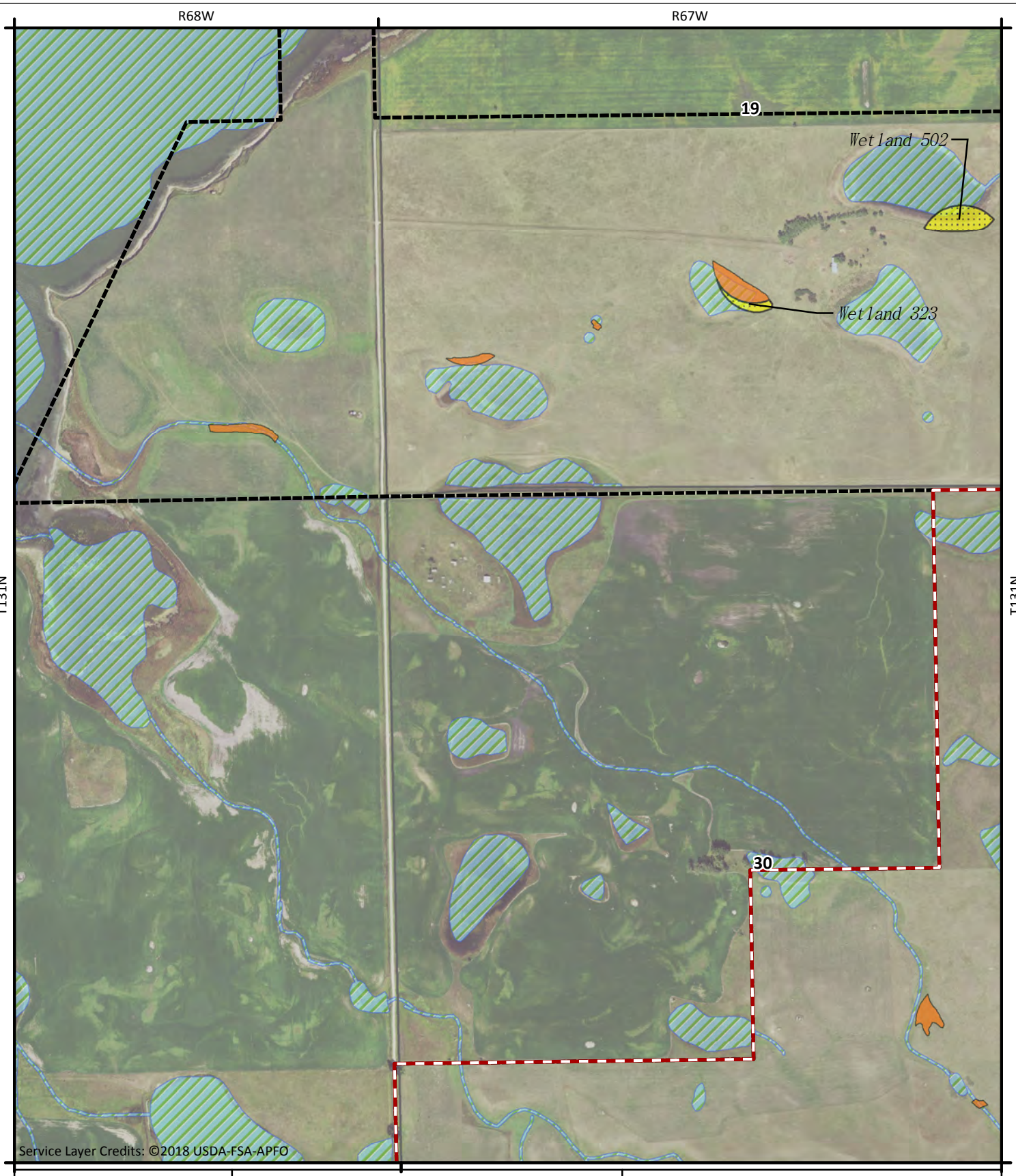

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C1	C2	C3	C4	C5	C6	
D1	D2	D3	D4	D5	D6	
		E3	E4	E5	E6	

KLJ Project Number: 1609132.1	
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Merricourt Wind Power Project
McIntosh and Dickey Counties
North Dakota

Wetland Delineation & USFWS NWI

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0 300 600 1,200 Feet

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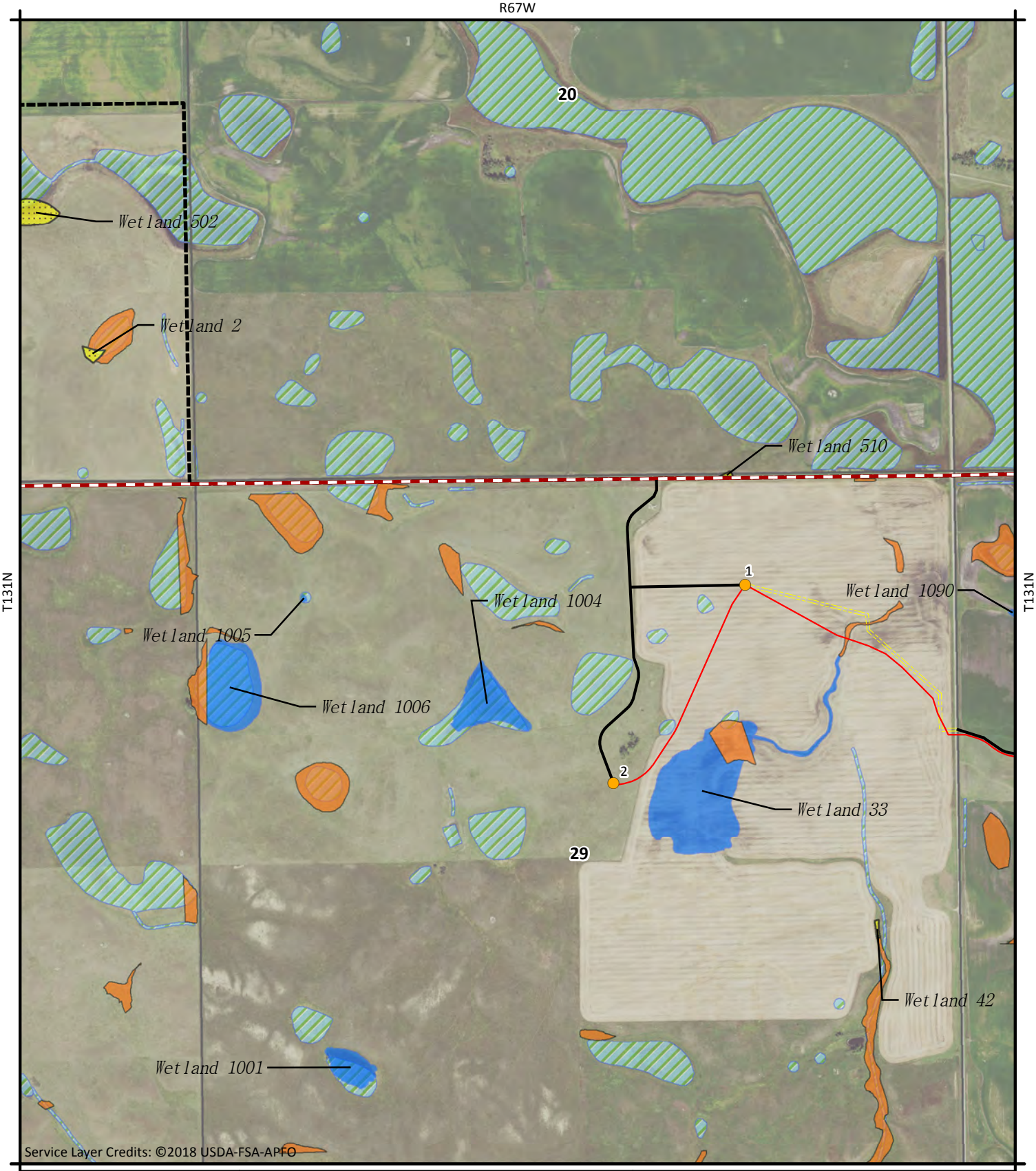

			A4	A5		
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C1	C2	C3	C4	C5	C6	
D1	D2	D3	D4	D5	D6	
		E3	E4	E5	E6	

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Merricourt Wind Power Project
McIntosh and Dickey Counties
North Dakota

Wetland Delineation & USFWS NWI

N W E S

0 300 600 1,200 Feet

1:11,000

KLJ

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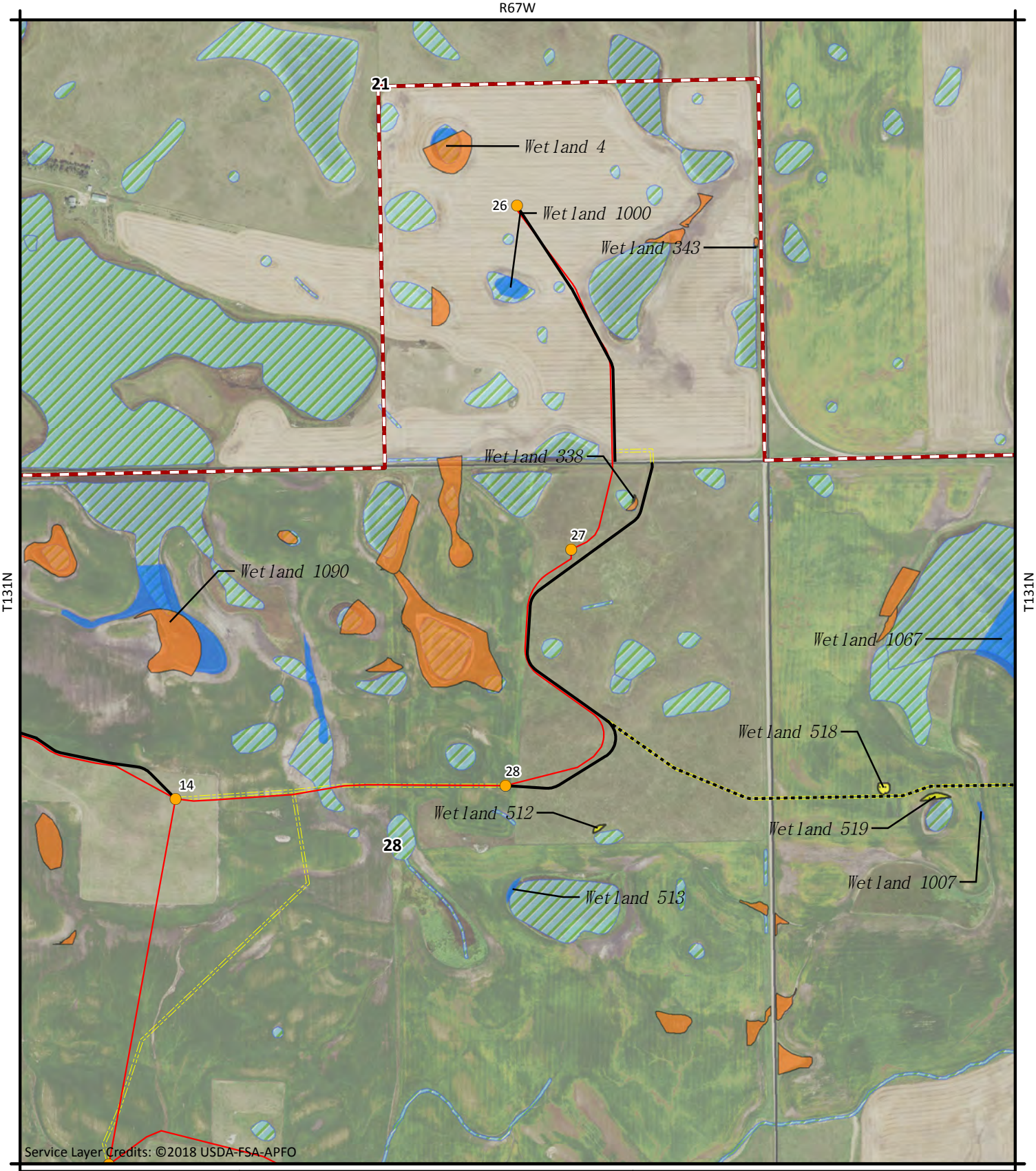

			A4	A5		
B1	B2	B3	B4	B5	B6	B7
C1	C2	C3	C4	C5	C6	
D1	D2	D3	D4	D5	D6	
		E3	E4	E5	E6	

KLJ Project Number: 1609132.1	
Date Created: 7/12/2019	Created By: JDP

Merricourt Wind Power Project
McIntosh and Dickey Counties
North Dakota

Wetland Delineation & USFWS NWI

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- Final Project Boundary
- Wetland Delineation Boundary
- Office Delineated Wetlands
- Previously Delineated Wetlands
- 2016 Field Wetlands
- NWI Wetlands
- Primary Turbine Location
- Alternate Turbine Location
- Met Towers
- Primary Access Road
- Alternate Access Road
- Temporary Access Road
- Collection Lines
- Crane Paths
- Operations and Maintenance

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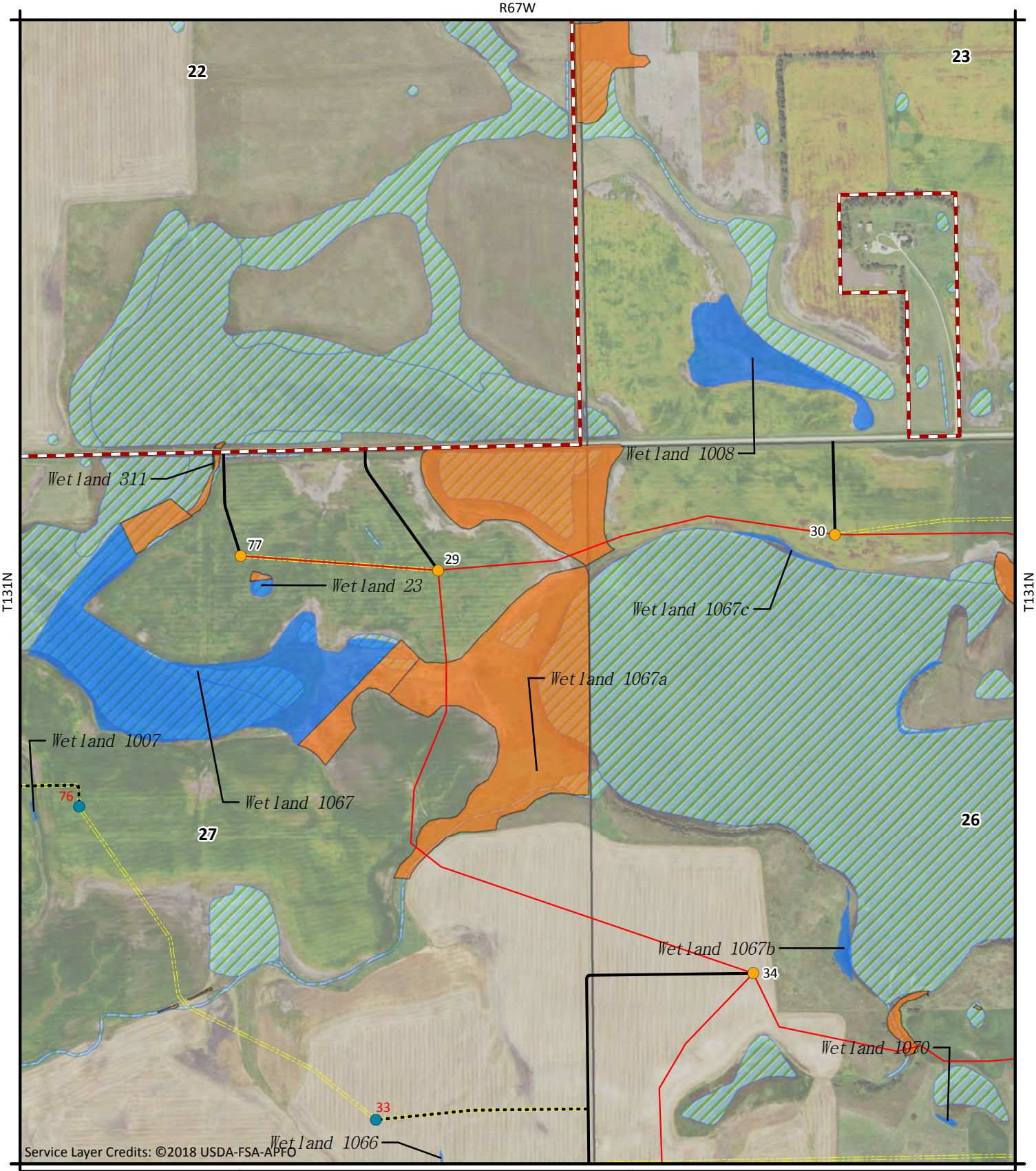

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McIntosh and Dickey Counties
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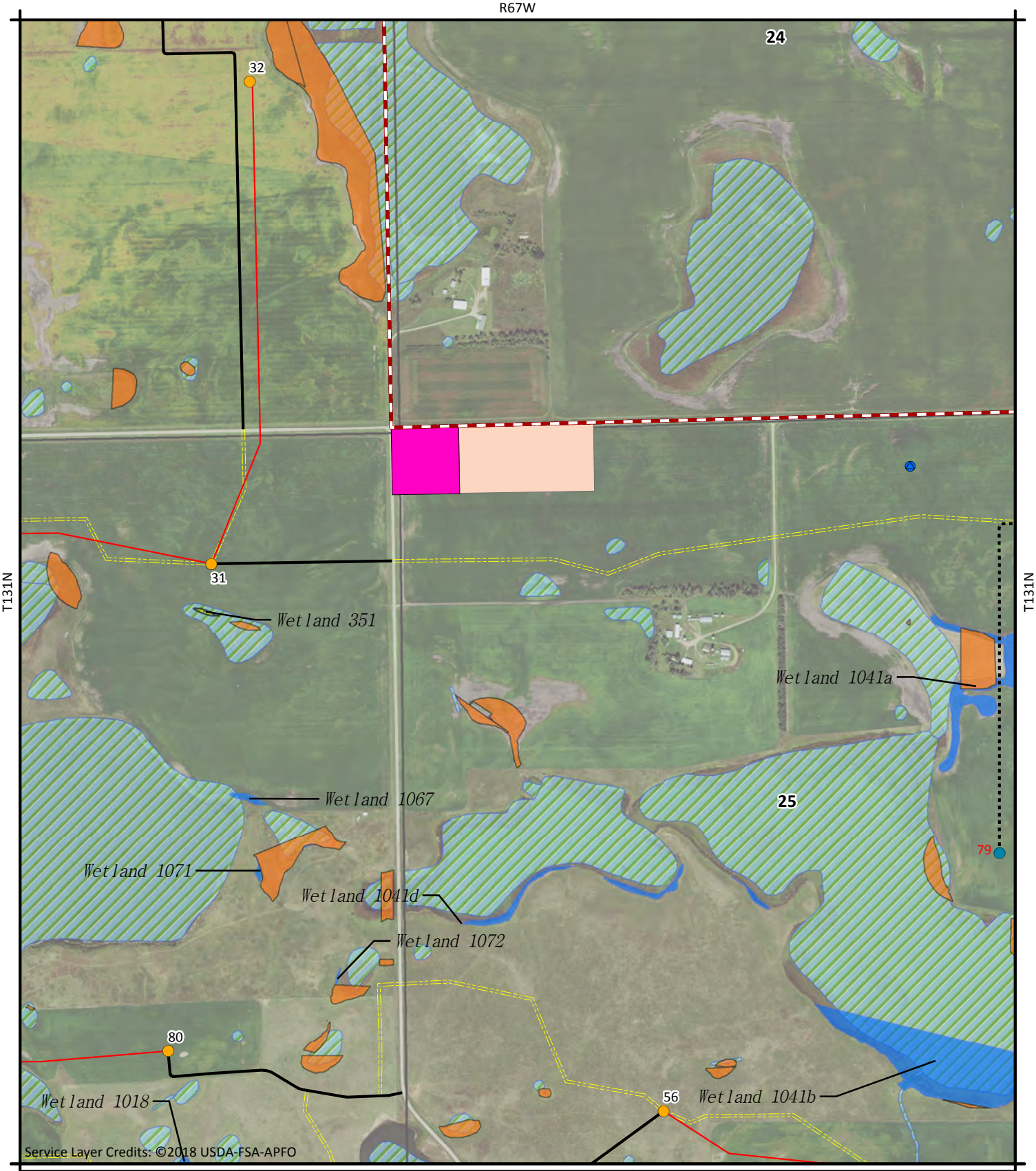

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Merricourt Wind Power Project
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- Laydown Yard

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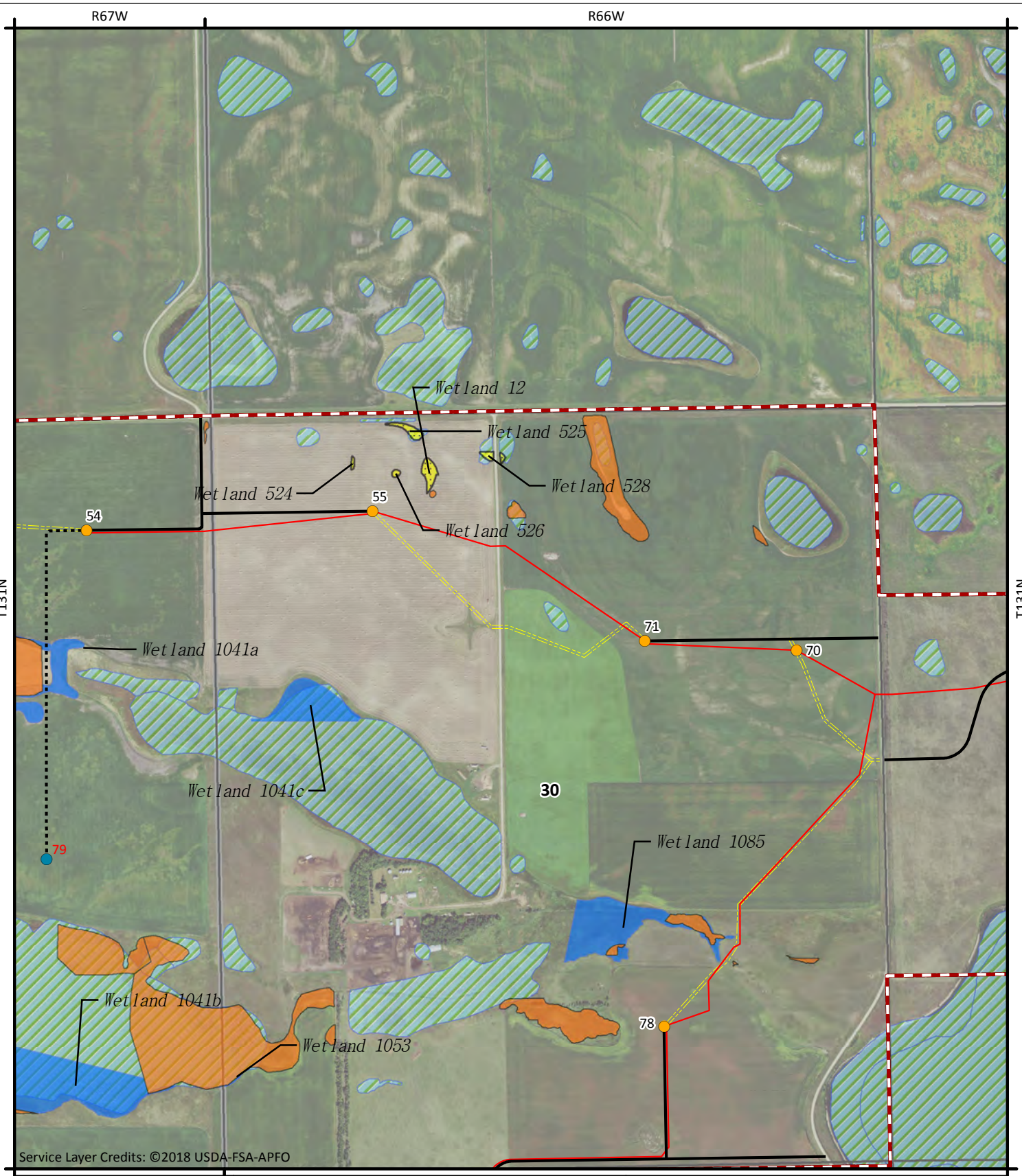

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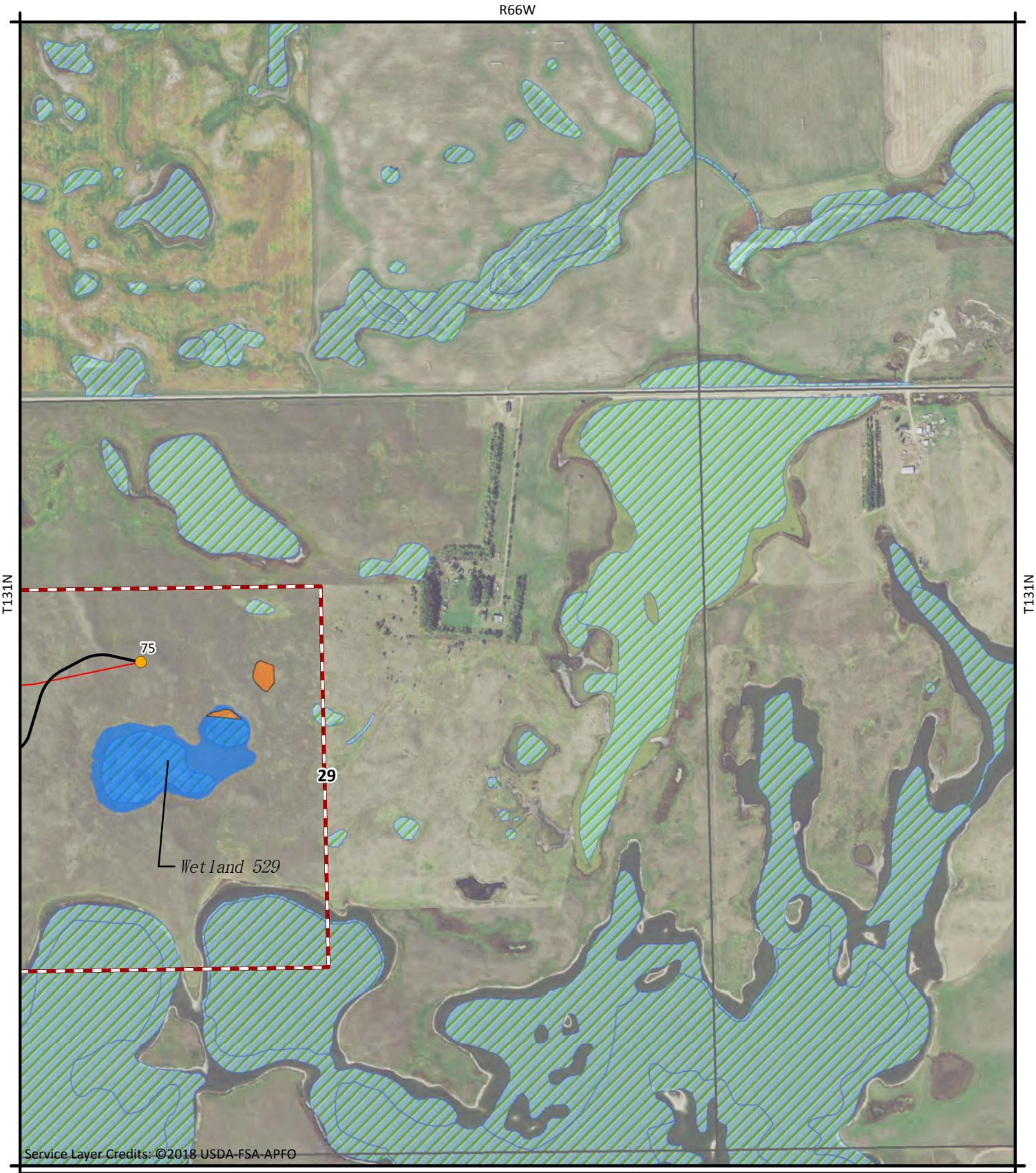

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Merricourt Wind Power Project
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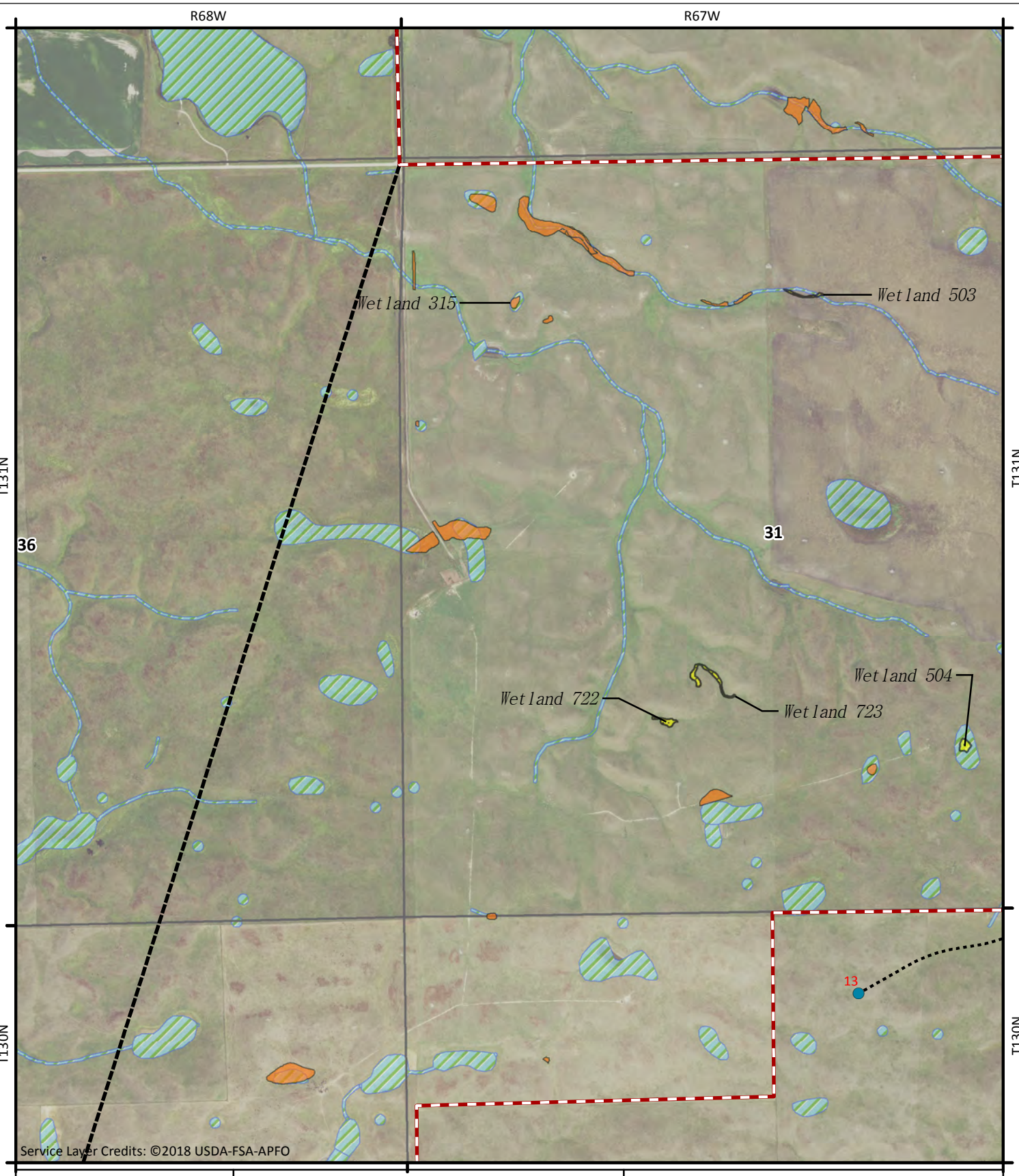

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D1	D2	D3	D4	D5	D6	
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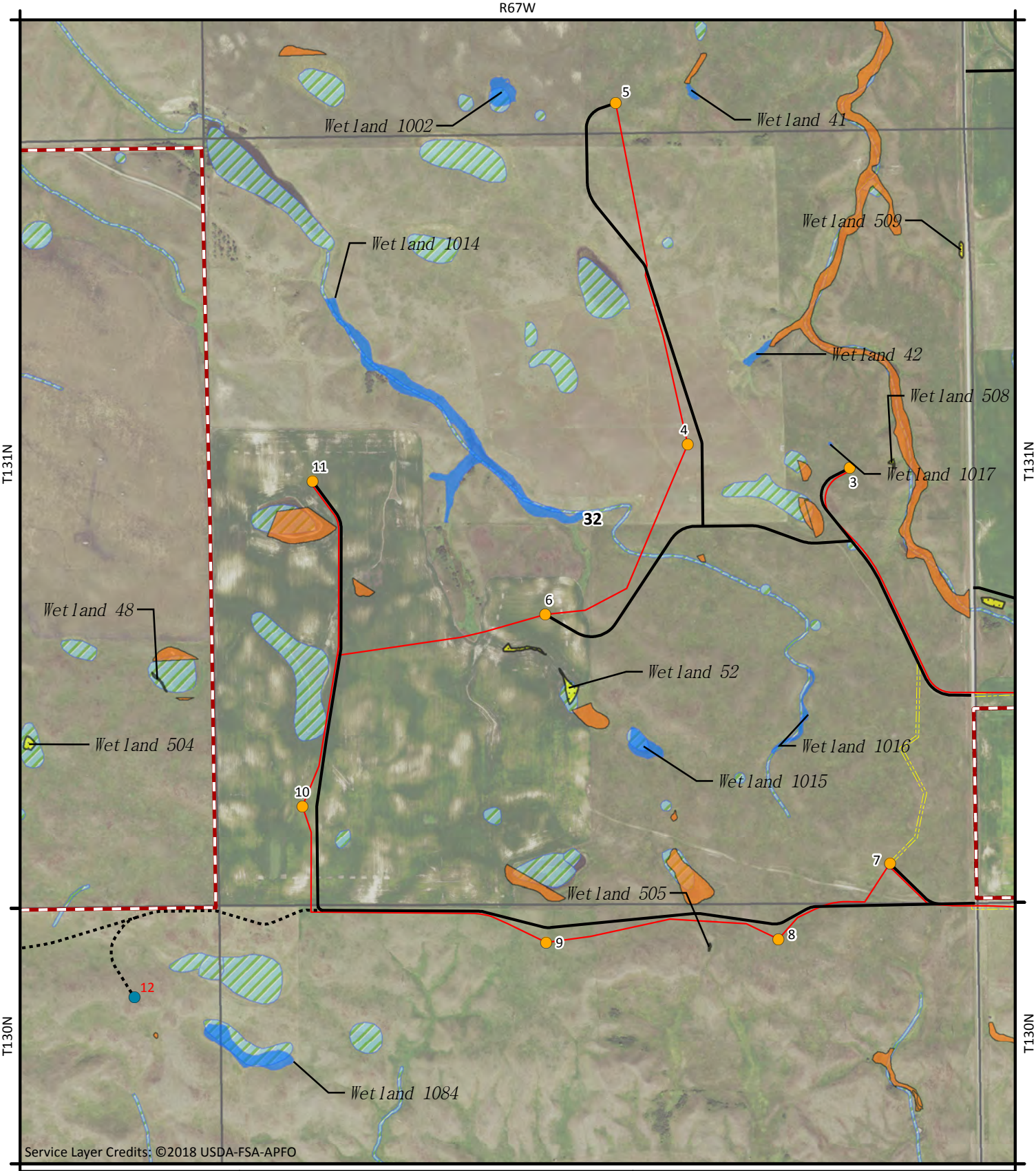

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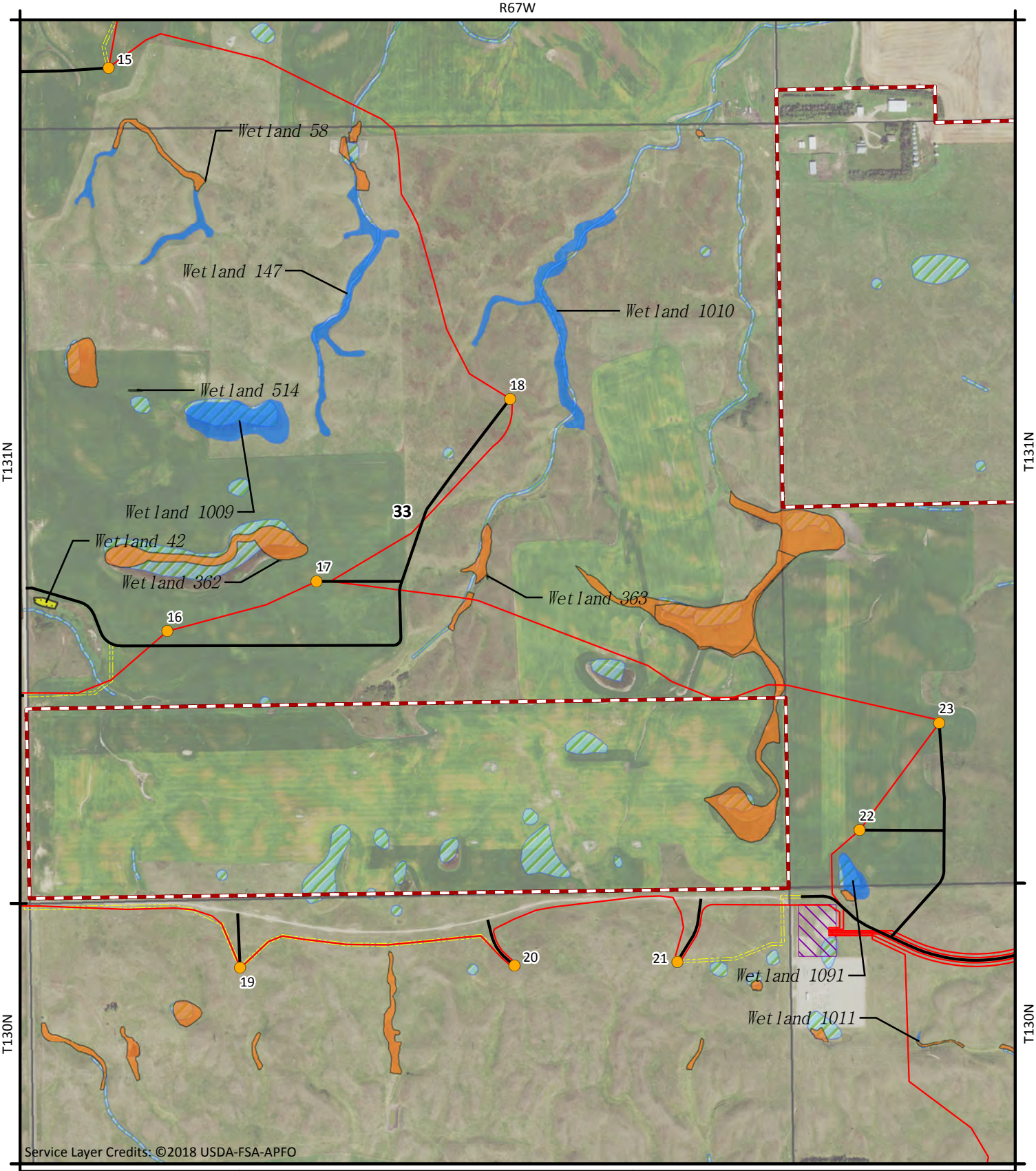

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- Substation

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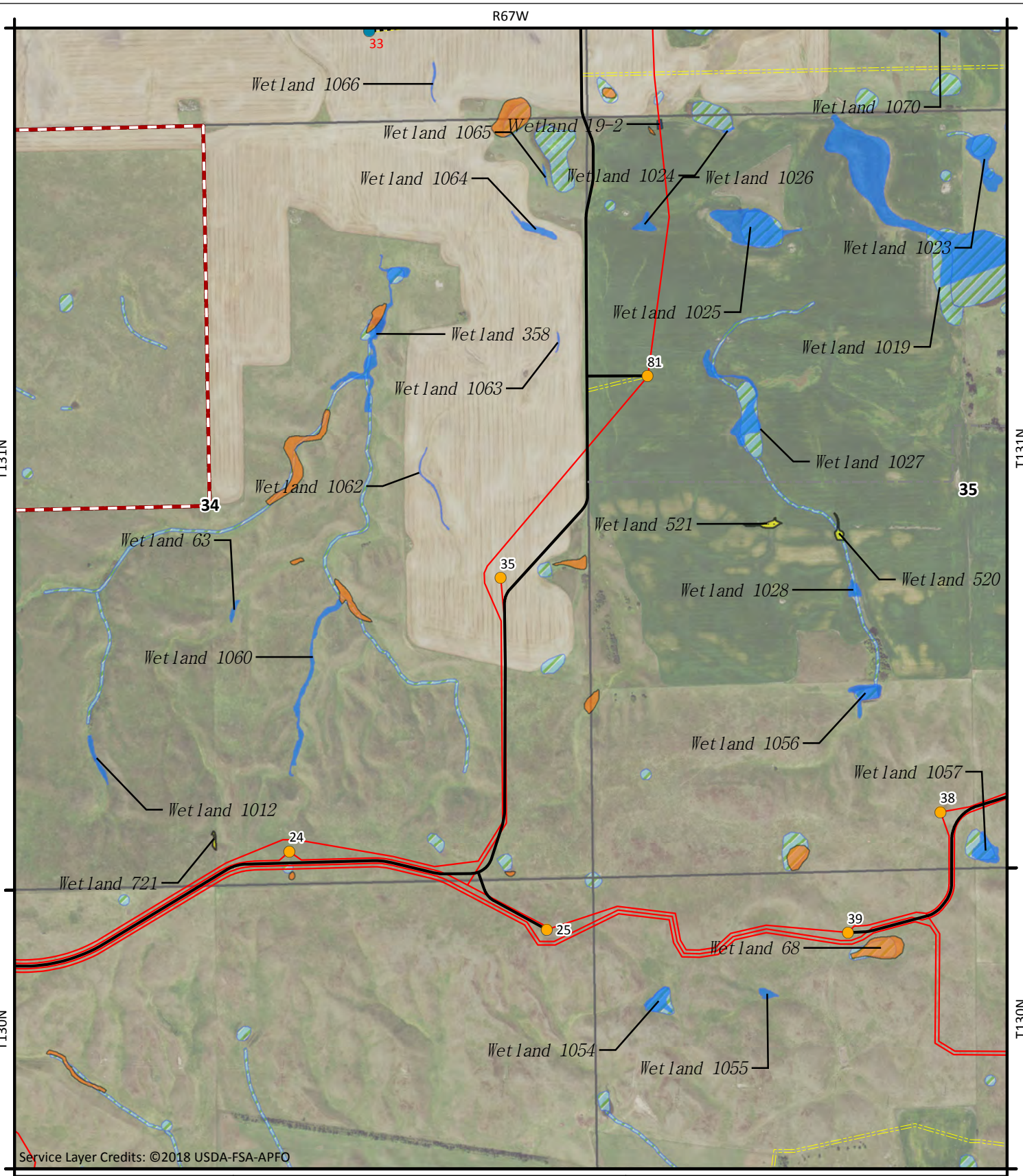

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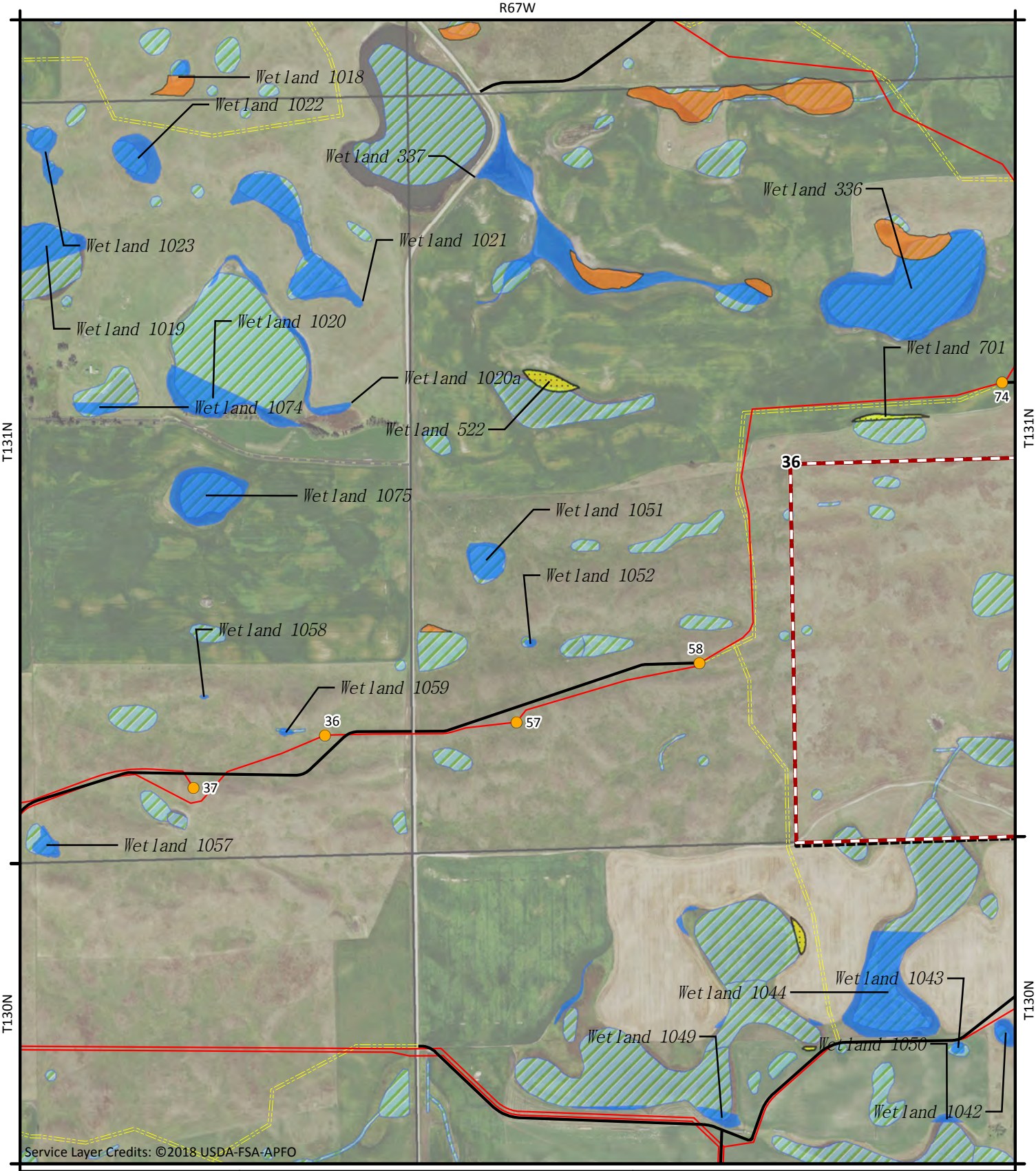

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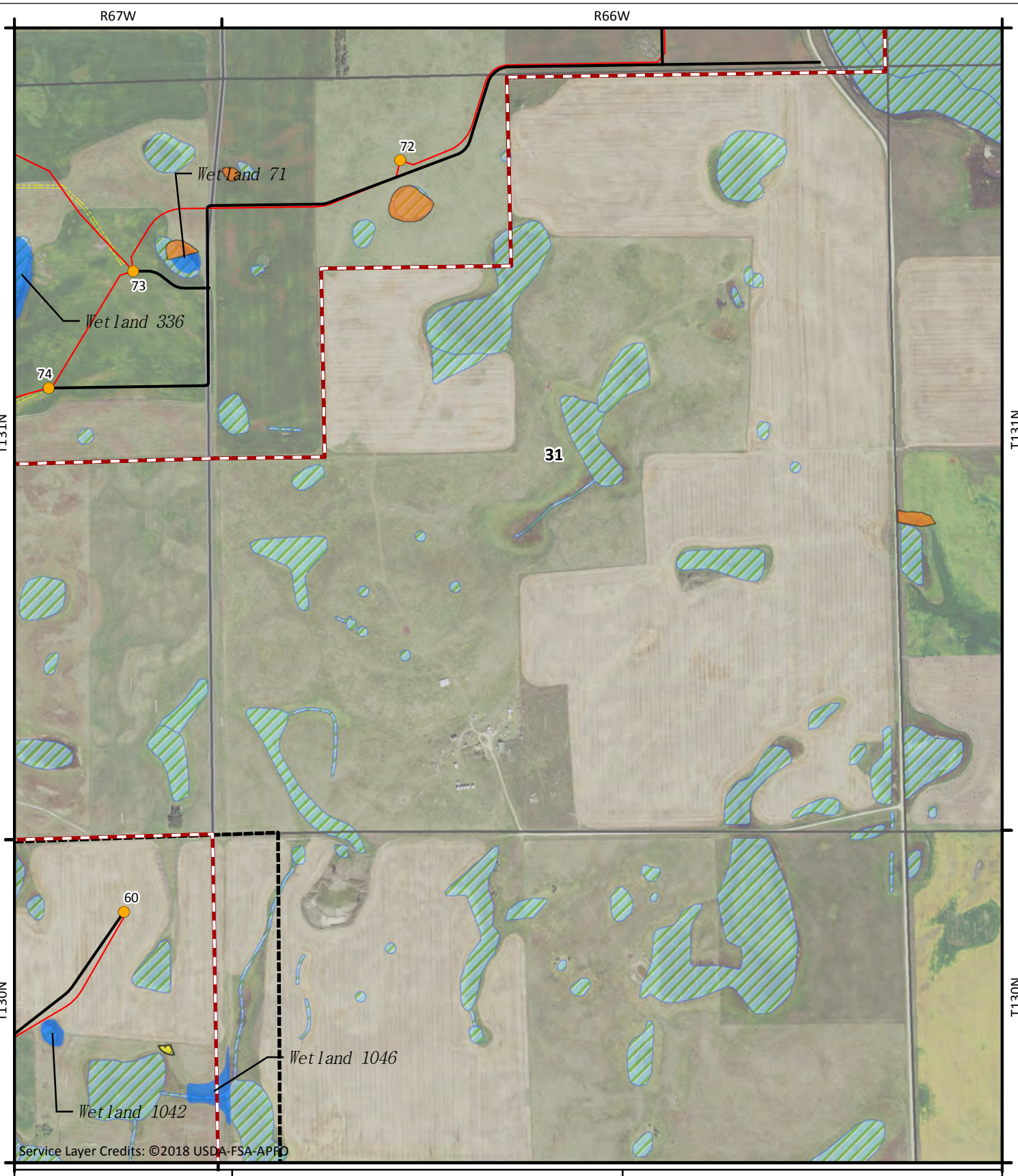

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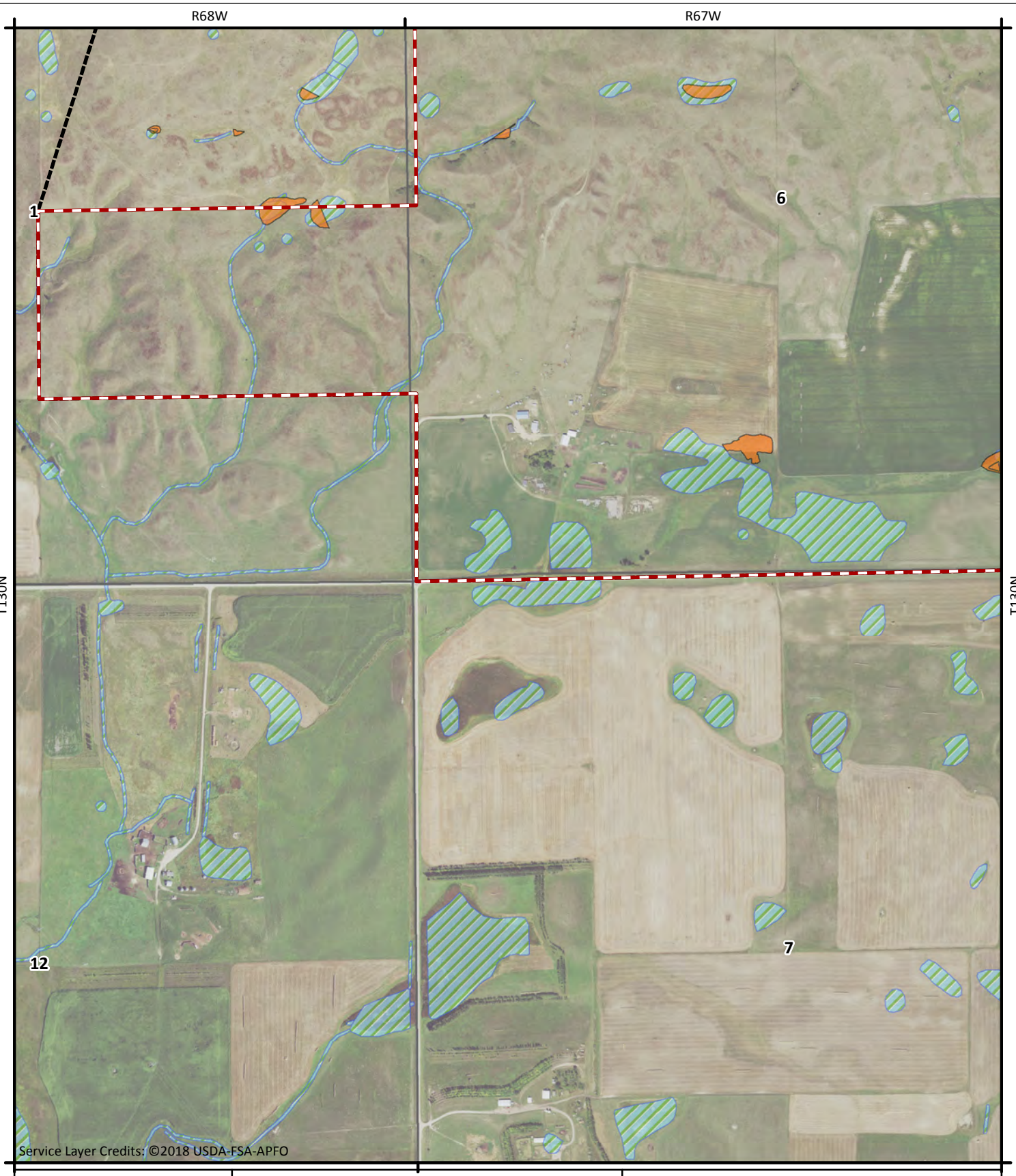

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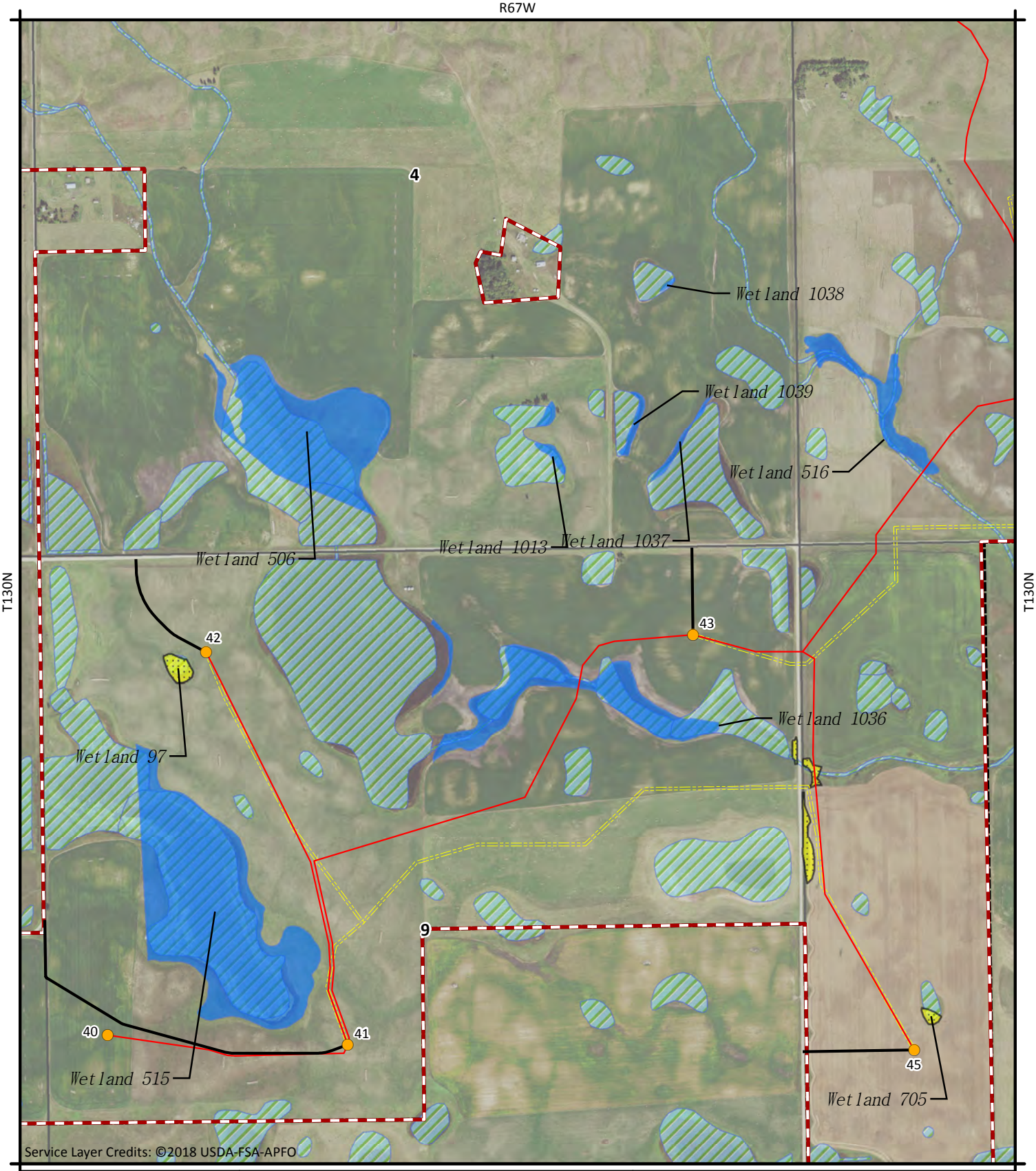

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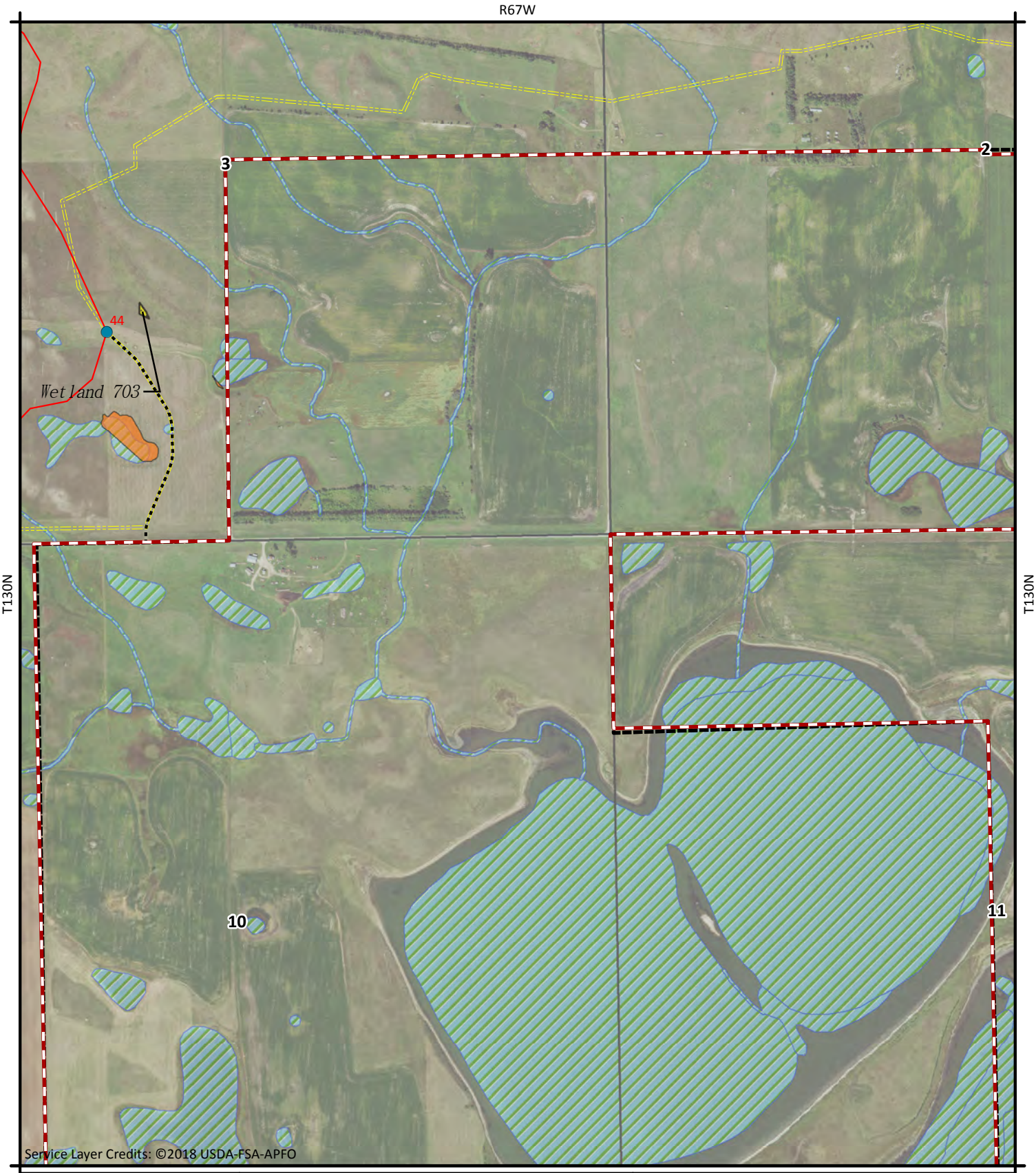

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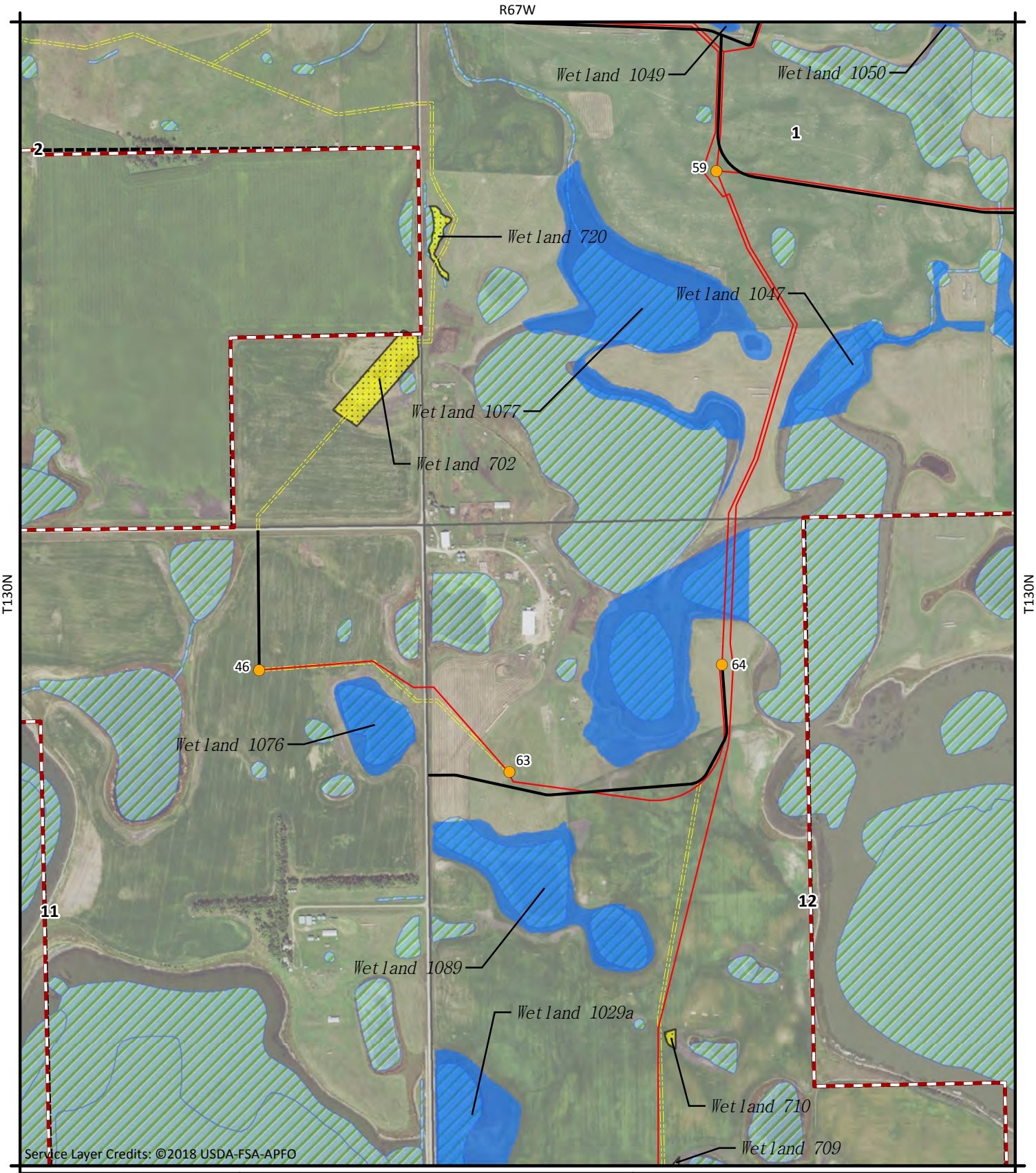

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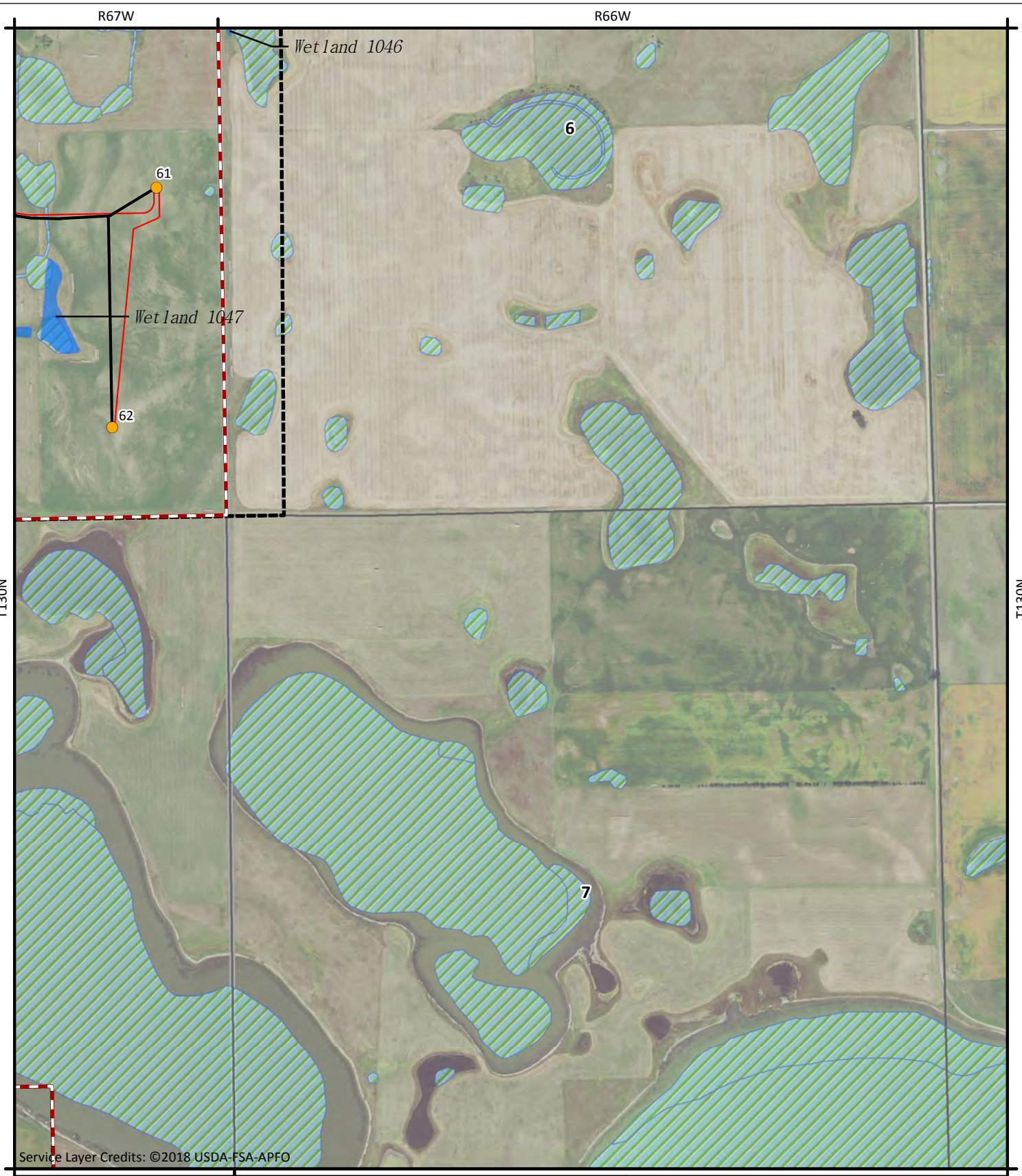

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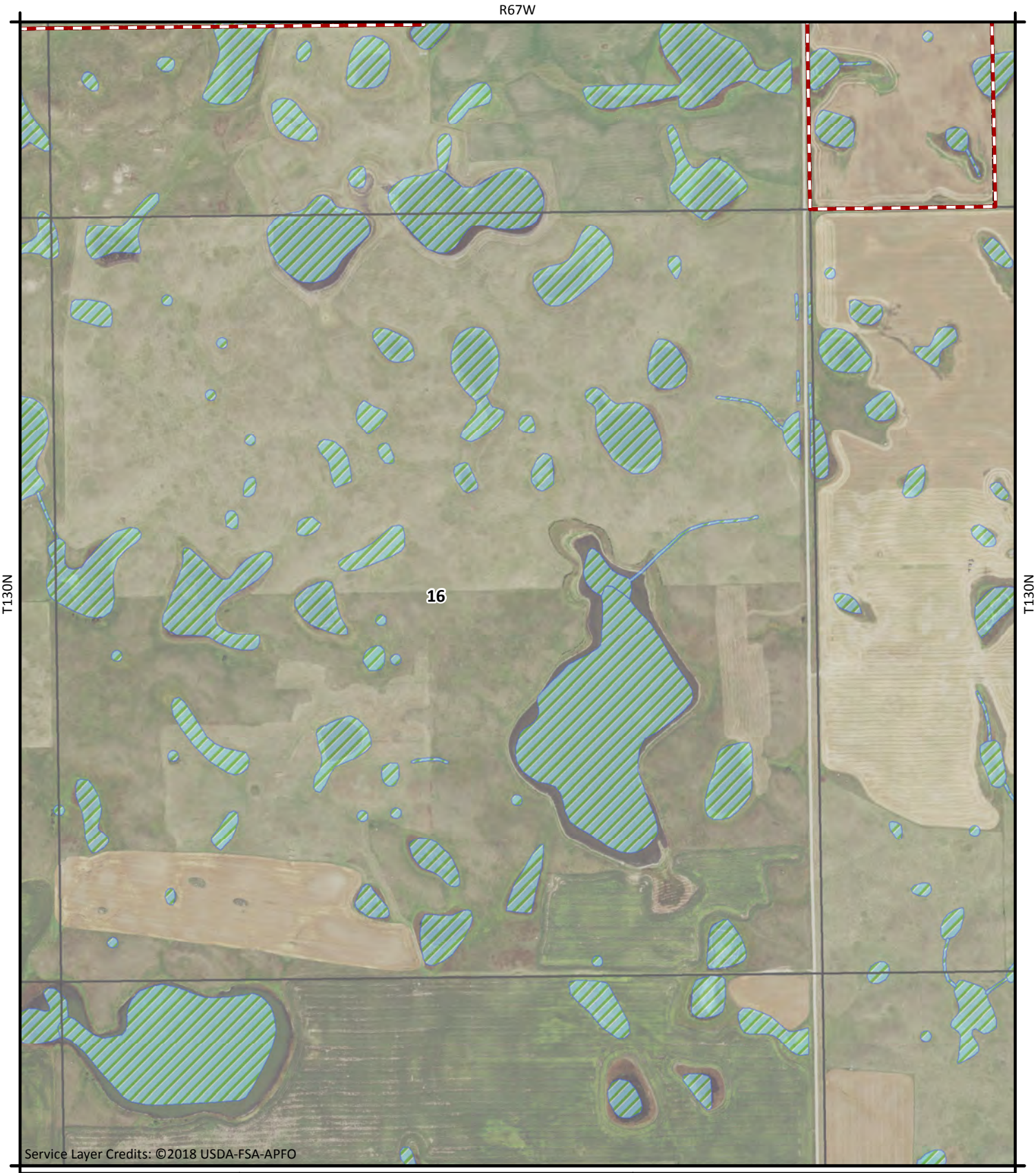

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- Alternate Turbine Location
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- Primary Access Road
- Alternate Access Road
- Temporary Access Road
- Collection Lines
- Crane Paths
- Operations and Maintenance

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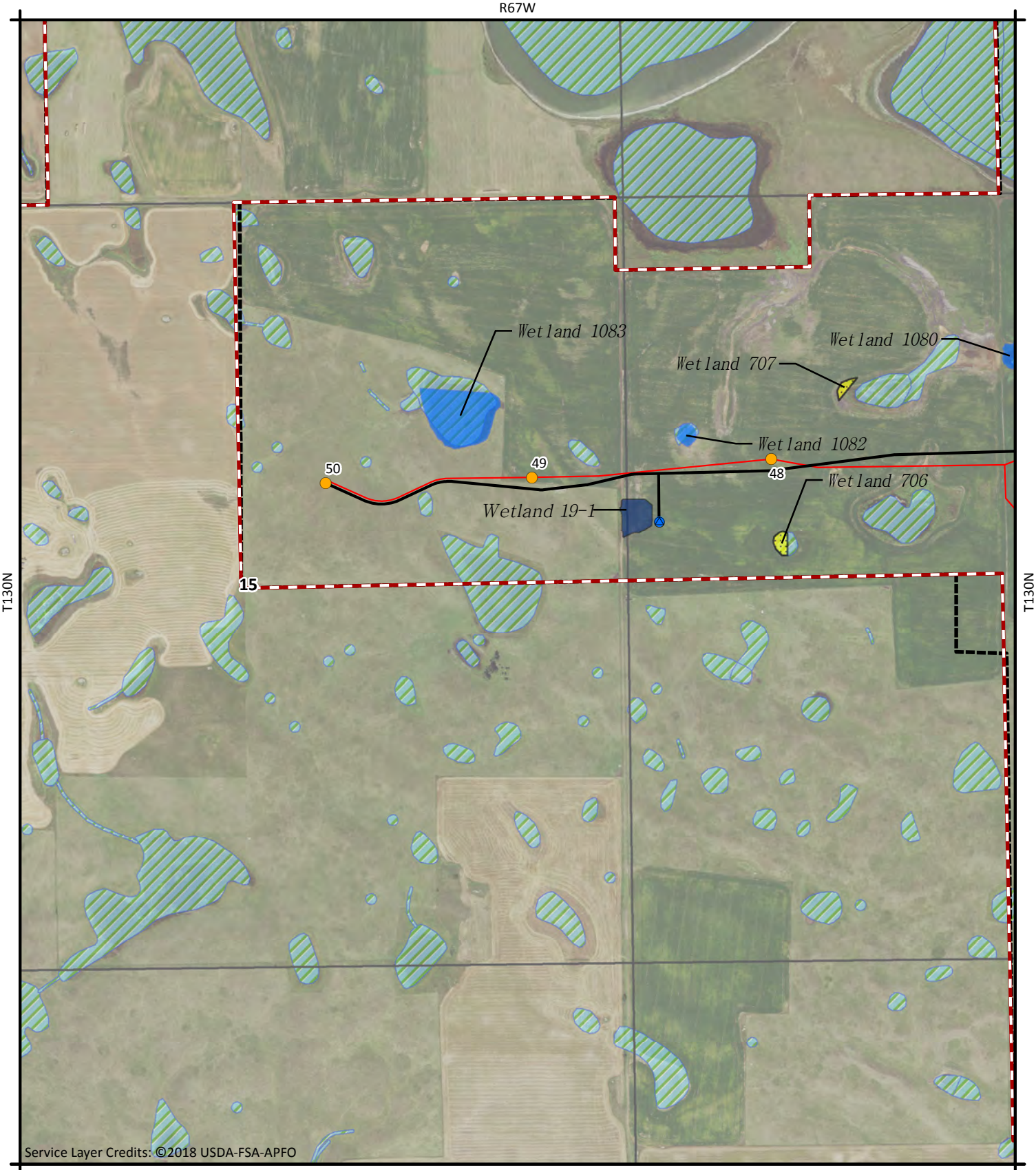

			A4	A5		
B1	B2	B3	B4	B5	B6	B7
C1	C2	C3	C4	C5	C6	
D1	D2	D3	D4	D5	D6	
		E3	E4	E5	E6	

KLJ Project Number: 1609132.1
Date Created: 7/12/2019 | Created By: JDP

Merricourt Wind Power Project
McIntosh and Dickey Counties
North Dakota

Wetland Delineation & USFWS NWI

N W E S

0 300 600 1,200 Feet

KLJ

1:11,000

- Final Project Boundary
- Wetland Delineation Boundary
- Office Delineated Wetlands
- Previously Delineated Wetlands
- 2016 Field Wetlands
- 2019 Field Wetlands
- NWI Wetlands
- Primary Turbine Location
- Alternate Turbine Location
- Met Towers
- Primary Access Road
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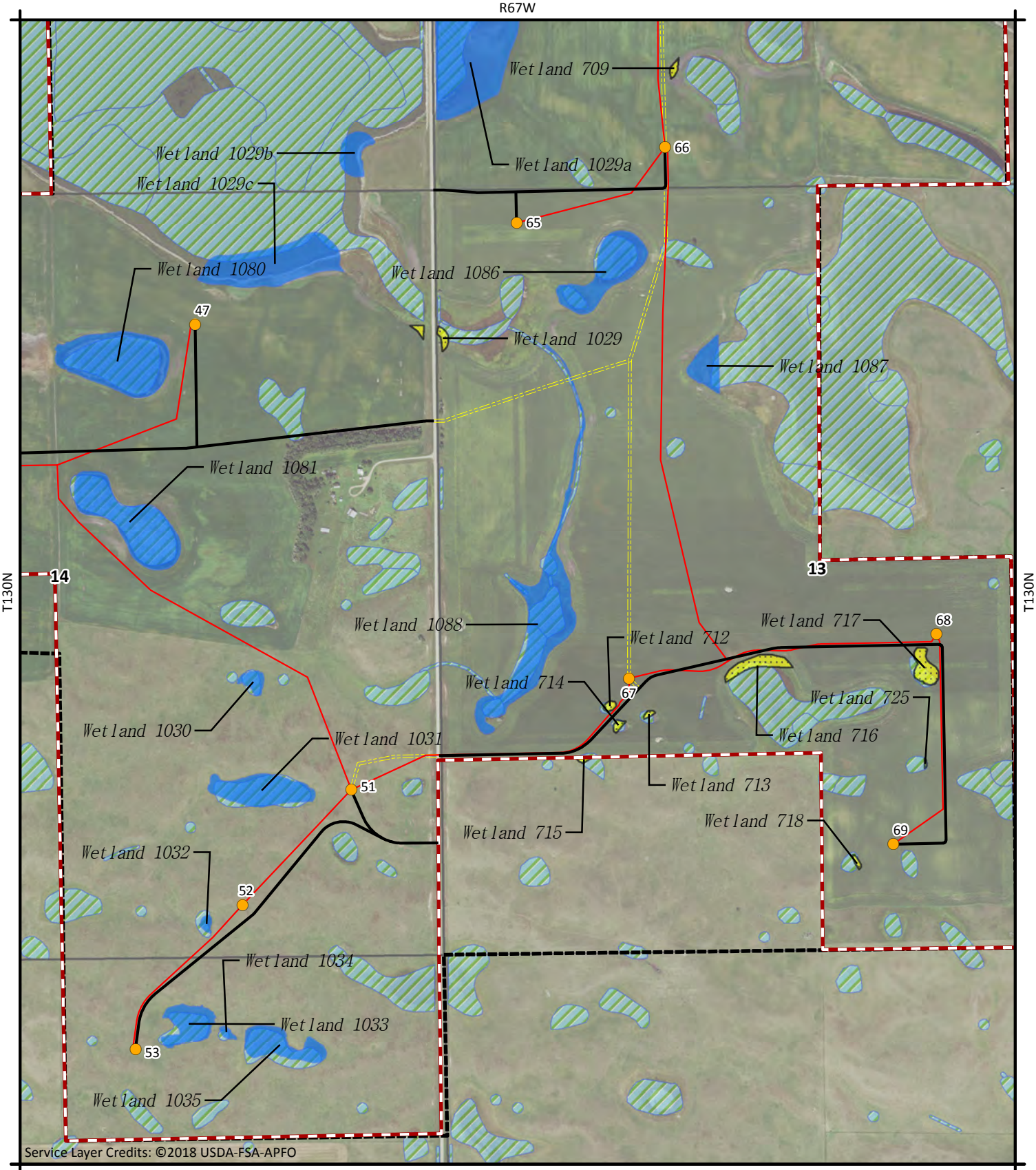

			A4	A5		
B1	B2	B3	B4	B5	B6	B7
C1	C2	C3	C4	C5	C6	
D1	D2	D3	D4	D5	D6	
		E3	E4	E5	E6	

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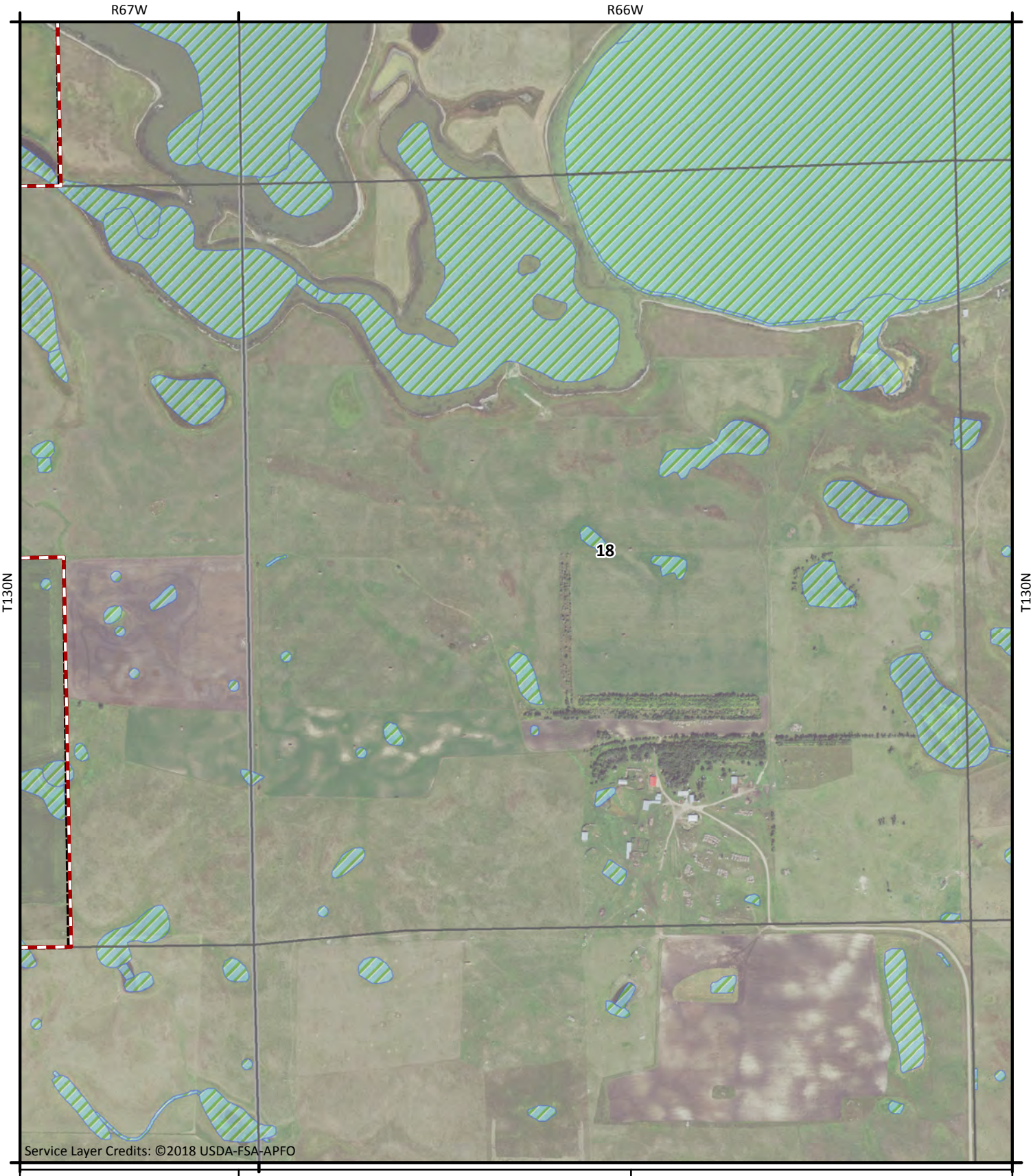

			A4	A5		
B1	B2	B3	B4	B5	B6	B7
C1	C2	C3	C4	C5	C6	
D1	D2	D3	D4	D5	D6	
		E3	E4	E5	E6	

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Date Created: 7/12/2019	Created By: JDP

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Wetland 19-1

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Merricourt - 2019 City/County: _____ Sampling Date: 7-2-19

Applicant/Owner: _____ State: _____ Sampling Point: 1/2

Investigator(s): JC Section, Township, Range: _____

Landform (hillslope, terrace, etc.): dep / hillslope Local relief (concave, convex, none): CC/CV Slope (%): 0/10

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: NAD 83

Soil Map Unit Name: _____ NWI classification: PEMA

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? 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 [X]	No [ ]	**Is the Sampled Area within a Wetland?** Yes [ ] No [ ]
Hydric Soil Present?	Yes [X]	No [ ]	
Wetland Hydrology Present?	Yes [X]	No [ ]	

Remarks: w) dip in cropped field - Mostly bare ground due to planting while wet? Obvious spray effect - most plants (other than corn) dead

u) DP taken outside of SA - wanted to take outside of field for less compaction

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15 ft radius)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		

Herb Stratum (Plot size: 5 ft radius)			
1. Foxtail Barley	5	Y	FACW
2.			
3.			
4.			
5.			
6. Brome	80		
7. KCB	15		
8. Common Barley	5		
9.			
10.			
	0 = Total Cover		

Woody Vine Stratum (Plot size: 30 ft radius)			
1.			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 95/0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding 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 = 0
FACW species		x 2 = 0
FAC species		x 3 = 0
FACU species		x 4 = 0
UPL species		x 5 = 0
Column Totals:	0 (A)	0 (B)

Prevalence Index = B/A = NaN

Hydrophytic Vegetation Indicators:

- [X] 1 - Rapid Test for Hydrophytic Vegetation
- [ ] 2 - Dominance Test is >50%
- [ ] 3 - Prevalence Index is ≤3.0[1]
- [ ] 4 - 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 [X] No [ ]

Remarks:

SOIL

Sampling Point: 1/2

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR2/1	100					SiL	
10-17	2.5Y 7/1	100			D	M	SL	
0-8	10YR3/2	100					SiL	
8-16	10YR 3/1	100					SiL	

[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 F**)
- ☐ 1 cm Muck (A9) (**LRR F, G, H**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ☐ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ☐ 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)
- ☐ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR I, J**)
- ☐ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ☐ Dark Surface (S7) (**LRR G**)
- ☐ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ 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:

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)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Dry-Season Water Table (C2)
- ☐ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ☐ Presence of Reduced Iron (C4)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☑ Surface Soil Cracks (B6)
- ☑ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☑ FAC-Neutral Test (D5)
- ☐ Frost-Heave Hummocks (D7) (**LRR F**)

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 19-2

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: MMCrk 2019 City/County: _____ Sampling Date: 7-2-19

Applicant/Owner: _____ State: _____ Sampling Point: 5/4

Investigator(s): _____ Section, Township, Range: _____

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): CC/CV Slope (%): _____

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: NAD 83

Soil Map Unit Name: _____ NWI classification: PEMC

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 ☐	**Is the Sampled Area within a Wetland?** Yes ☐ No ☐
Hydric Soil Present?	Yes ☐	No ☐	
Wetland Hydrology Present?	Yes ☐	No ☐	

Remarks: WL located between 2 cropped fields

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft radius)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5 ft radius)			
1. Grass	30		
2. Cin Sedge	20		
3.			
4.			
5.			
6. Bmm	20		
7. Pcal	20		
8. Thasac	10		
9.			
10.			
	0 = Total Cover		
Woody Vine Stratum (Plot size: 30 ft radius)			
1.			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 50/0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding 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 = 0
FACW species		x 2 = 0
FAC species		x 3 = 0
FACU species		x 4 = 0
UPL species		x 5 = 0
Column Totals:	0 (A)	0 (B)

Prevalence Index = B/A = NaN

Hydrophytic Vegetation Indicators:

☐ 1 - Rapid Test for Hydrophytic Vegetation

☐ 2 - Dominance Test is >50%

☐ 3 - Prevalence Index is ≤3.0[1]

☐ 4 - 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: 3/4

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 2/1	50	10YR 4/4	50	D	M	SiL	
6-11	10YR 2/1	90	10YR 6/3	7	D	M	SiL	
			10YR 4/6	3	C	M		

[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 F)**
- ☐ 1 cm Muck (A9) **(LRR F, G, H)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ☐ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ☐ 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)
- ☐ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR I, J)**
- ☐ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ☐ Dark Surface (S7) **(LRR G)**
- ☐ High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 73)**
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ 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:

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)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
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- ☐ Inundation Visible on Aerial Imagery (B7)
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- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Dry-Season Water Table (C2)
- ☐ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ☐ Presence of Reduced Iron (C4)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☒ Drainage Patterns (B10)
- ☐ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☒ Geomorphic Position (D2)
- ☒ FAC-Neutral Test (D5)
- ☐ Frost-Heave Hummocks (D7) **(LRR F)**

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: