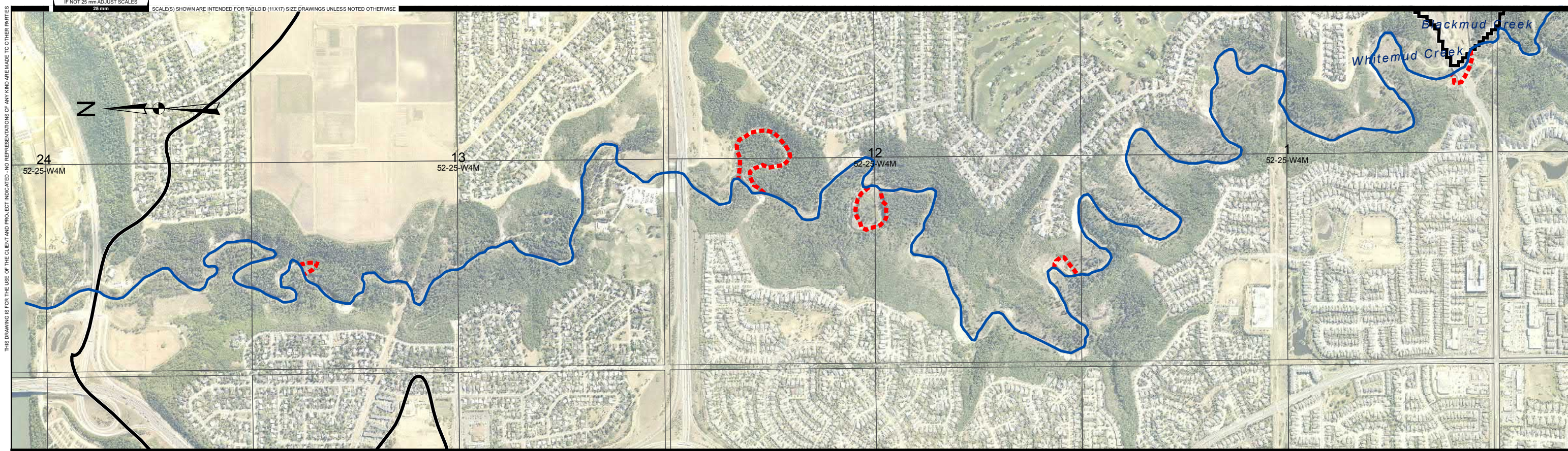


# TECHNICAL MEMORANDUM

## Appendix A – Historic Channels





P:\2016\3785\00\_Blackmud\_Whitemud\Working\_Dwg\010\_GIS\ArcMap\01\_EnvironmentalMap\_HistoricChannel\_LDD.mxd  
DATE: 10/9/2016



**Legend:**  
— Whitemud Creek (2012)  
- - - Whitemud Creek (1949)

AE PROJECT No.	2016-3785
SCALE	1:15,000
APPROVED	
DATE	2016 OCTOBER
REV	
DESCRIPTION	ISSUED FOR REPORT

**FIGURE No. A-1**  
 BLACKMUD/WHITEMUD CREEK  
 WATERSHED MANAGEMENT STUDY  
 ENVIRONMENTAL  
 HISTORIC CREEK CHANNEL  
 WHITEMUD CREEK



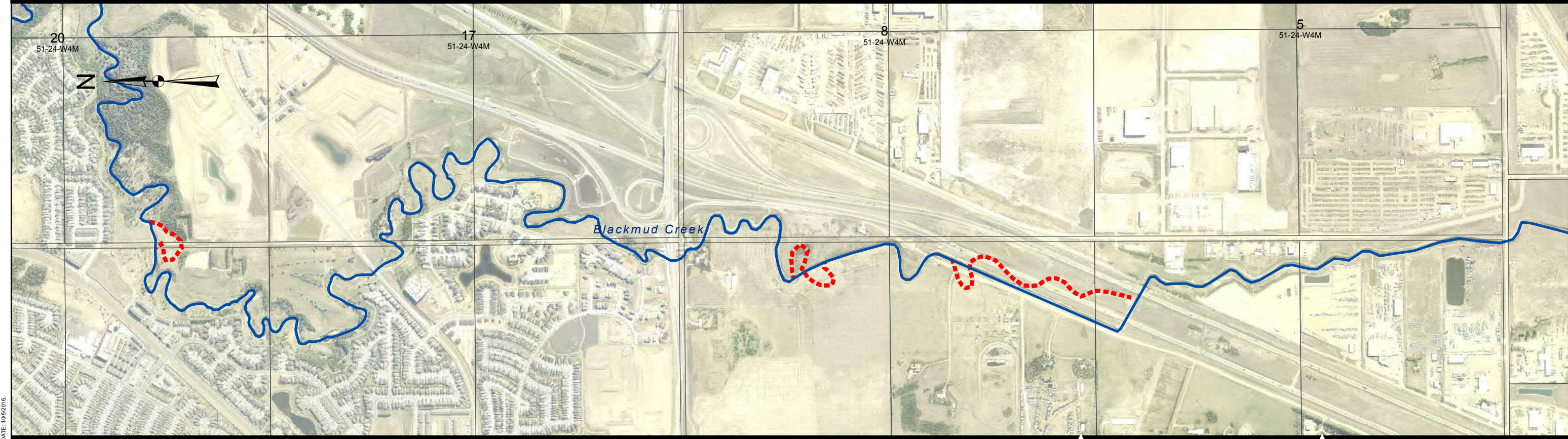
P:\2016\3785\00\_Blackmud\_Whitemud\Working\_Dwg\010\_GIS\ArcMap\01\_EnvironmentalMap\_HistoricChannel\_LDD.mxd  
 DATE: 10/29/2016



**Legend:**  
 ——— Whitemud Creek (2012)  
 - - - - - Whitemud Creek (1949)

<b>AE PROJECT No.</b>	2016-3785
<b>SCALE</b>	1:15,000
<b>APPROVED</b>	
<b>DATE</b>	2016 OCTOBER
<b>REV</b>	
<b>DESCRIPTION</b>	ISSUED FOR REPORT

**FIGURE No. A-2**  
 BLACKMUD/WHITEMUD CREEK  
 WATERSHED MANAGEMENT STUDY  
 ENVIRONMENTAL  
 HISTORIC CREEK CHANNEL  
 WHITEMUD CREEK



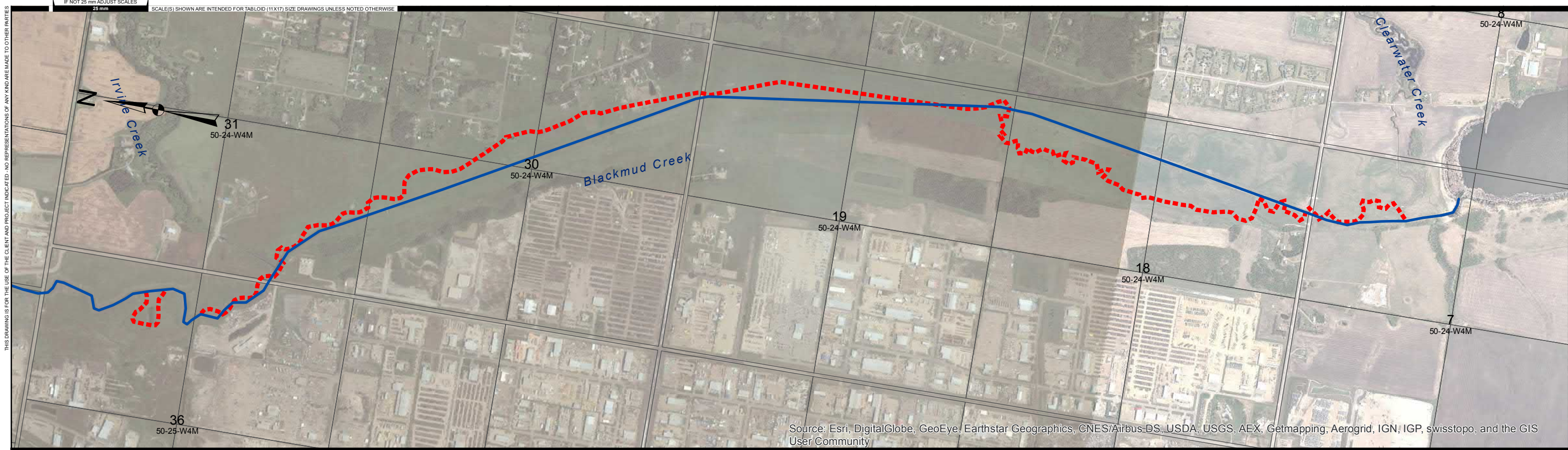
P:\2016\3785\00\_Blackmud\_Whitemud\Working\_Dwg\010\_GIS\ArcMap\01\_EnvironmentalMap\_HistoricChannel\_LDD.mxd  
DATE: 10/9/2016



**Legend:**  
— Blackmud Creek (2012)  
- - - Blackmud Creek (1949)

AE PROJECT No.	2016-3785
SCALE	1:15,000
APPROVED	
DATE	2016 OCTOBER
REV	
DESCRIPTION	ISSUED FOR REPORT

**FIGURE No. A-3**  
 BLACKMUD/WHITEMUD CREEK  
 WATERSHED MANAGEMENT STUDY  
 ENVIRONMENTAL  
 HISTORIC CREEK CHANNEL  
 BLACKMUD CREEK



P:\2016\3785\00\_Blackmud\_Whitemud\Working\_Dwg\010\_GIS\ArcMap\01\_EnvironmentalMap\_HistoricChannel\_LDD.mxd  
 DATE: 10/9/2016



- Legend:**
- Blackmud Creek (2012)
  - - - Blackmud Creek (1949)

AE PROJECT No.	2016-3785
SCALE	1:20,000
APPROVED	
DATE	2016 OCTOBER
REV	
DESCRIPTION	ISSUED FOR REPORT

**FIGURE No. A-4**  
 BLACKMUD/WHITEMUD CREEK  
 WATERSHED MANAGEMENT STUDY  
 ENVIRONMENTAL  
 HISTORIC CREEK CHANNEL  
 BLACKMUD CREEK

# TECHNICAL MEMORANDUM

## Appendix B – Erosion Sites Locations





**Table B-1  
Erosion and riparian health field assessment results**

Site ID	Watercourse Name	Watercourse Position	Coordinates (X)	Coordinates (Y)	Dominant Erosion Process	Bank Side	Bank Height (m)	Bank Slope (degrees)	Feature Length (m)	Site Aspect	Dominant Vegetation	Total Vegetation Cover (%)	Invasive Cover (%)	Woody Plant Cover (%)	Deadwood Cover (%)	Deep-rooted Streambank (%)	Human Alterations (%)	Signs of Erosion	Structures at Risk	Construction Access Concerns
203	Blackmud Creek	Lower	-113.499426	53.422283	I	Left	5	90	50	W/NW	white spruce, prickly rose, grasses, perennial sow thistle	90	1	35	5	0	2	Undercut banks, slumping, uprooted vegetation	Trail at top of bank	No - existing trail to site
204	Blackmud Creek	Lower	-113.504855	53.420878	I	Left	1	10	20	E/SE	white spruce, balsam poplar, osier red dogwood, grasses, perennial sow thistle, creeping thistle	90		35	10	90	0	Undercut banks, driftwood impeding flow	No	Yes - animal trail
205	Blackmud Creek	Lower	-113.505049	53.419918	I	Left	8	40-90	2	E/NE	white spruce, mountain ash, wolf willow, prickly rose, osier red dogwood, grasses, perennial sow-thistle, creeping thistle	80	2	67	1	0	7	Undercut banks, slumping, uprooted vegetation	Trail at top of bank, 25 m away, private yard 27 m away, house 70 m away	No - small equipment can access from top of bank
206	Blackmud Creek	Lower	-113.503289	53.418651	I	Left	8	30	30	E	white spruce, white birch, prickly rose, Saskatoon, buckbrush	90	0	63	10	0	1	Slumping	Trails	No
208	Blackmud Creek	Lower	-113.499095	53.417837	I	Right	4	N/A	N/A	W	white spruce, mountain ash, Saskatoon, osier red dogwood, perennial sow thistle, creeping thistle, grasses	95	35	41	30	80	10	Undercut banks, slumping, seepage, erosion at toe, bedrock exposure, uprooted vegetation - site is a dry stream bed	No	No - need to clear path, barb wire present
209	Blackmud Creek	Lower	-113.501082	53.41813	ID	Left	2-4	60-90	40	SE	white birch, trembling aspen, white spruce, wolf willow, prickly rose, osier red dogwood, willow spp., buckbrush, grasses, creeping thistle	99	1	65	1	0	0	Undercut banks, slumping, erosion at toe, uprooted vegetation	No	No - small equipment access from top of bank
210	Blackmud Creek	Lower	-113.501291	53.41759	I	Left & Right	8	25	10	E	trembling aspen, balsam poplar, white spruce, white birch, osier red dogwood, prickly rose, willow spp., buckbrush, Saskatoon, grasses, creeping thistle	100	5	90	1	30	5	Weir impeding flow, minor slumping	Trail 25 m away	No - small equipment access from top of bank
213	Blackmud Creek	Lower	-113.507537	53.414724	I	Right	2	45	10		white spruce, white birch, grasses	95	0	105	1	50	0	Undercut banks, slumping	Laydown yard	Yes - 70 m of natural area to cross
216	Blackmud Creek	Lower	-113.512092	53.415865	ID	Left	8	45	20	S	white spruce, prickly rose, wolf willow, Saskatoon, buckbrush, grasses, meadow thistle	100	1	60	0	40	10	Slumping	House	No
222	Blackmud Creek	Lower	-113.518372	53.413748	N/A	Right	6	45	N/A	NW	white spruce, willow spp., wolf willow, osier red dogwood, buckbrush, grasses, perennial sow thistle, meadow thistle	95	2	50	5	50	1	No signs of erosion, old livestock access path naturally re-growing	No	No

Site ID	Watercourse Name	Watercourse Position	Coordinates (X)	Coordinates (Y)	Dominant Erosion Process	Bank Side	Bank Height (m)	Bank Slope (degrees)	Feature Length (m)	Site Aspect	Dominant Vegetation	Total Vegetation Cover (%)	Invasive Cover (%)	Woody Plant Cover (%)	Deadwood Cover (%)	Deep-rooted Streambank (%)	Human Alterations (%)	Signs of Erosion	Structures at Risk	Construction Access Concerns
223	Blackmud Creek	Lower	-113.520405	53.413468	I	Left	3	60	30	E	buckbrush, grasses	95	0	1	5	0	2	Slumping, uprooted vegetation	Condos 40 m away	No
224	Blackmud Creek	Lower	-113.51916	53.410984	N/A	Right	8	30	N/A	SW	white spruce, pin cherry, Saskatoon, mountain ash, grasses, perennial sow thistle, creeping thistle	100	2	13	1	95	1	No signs of erosion, area is a drainage channel	No	N/A
225	Blackmud Creek	Lower	-113.521082	53.409856	S	Right	2	90	100	S/SW	balsam poplar, white spruce, trembling aspen, prickly rose, wolf willow, buckbrush, grasses	100	0	51	1	100	0	Undercut banks, slumping, erosion at toe, uprooted vegetation	No	Yes - must cross creek or through riparian vegetation
226	Blackmud Creek	Lower	-113.521095	53.406968	ID	Right	5	40	40	NE	white spruce, buckbrush, grasses, perennial sow thistle, meadow thistle	95	3	60	1	95	2	Slumping	Trail and private yards 30 m away	No
227	Blackmud Creek	Lower	-113.518883	53.408159	N/A	Right	N/A	N/A	N/A	S/SE	balsam poplar, prickly rose, osier red dogwood, grasses, meadow thistle	100	2	7	1	100	2	* No erosion - bank burrow built by beaver	No	No
228	Blackmud Creek	Lower	-113.516158	53.406407	I	Right	4	90	40	S	white spruce, trembling aspen, prickly rose, osier red dogwood, grasses	60	0	65	1	50	1	Undercut banks, bedrock exposure, uprooted vegetation	No	No
229	Blackmud Creek	Lower	-113.515944	53.405948	I	Left	1	0	15	SE	white spruce, prickly rose, osier red dogwood, grasses	95	0	30	1	95	0	Undercut banks, slumping	No	No
231	Blackmud Creek	Lower	-113.51252	53.404425	I	Left	3	40-90	15	N/S	buckbrush, grasses, creeping thistle	90	20	20	0	50	2	Fence impeding flow, undercut banks, slumping	No	No
232	Blackmud Creek	Lower	-113.512584	53.403991	I	Right	3	40-90	15	N/S	buckbrush, grasses, creeping thistle	90	20	20	0	50	2	Fence impeding flow, undercut banks, slumping	No	No
233	Blackmud Creek	Lower	-113.51161	53.403113	I	Left	3	40-90	15	E	buckbrush, grasses, creeping thistle	90	20	20	0	50	0	Undercut banks, slumping	No	No
234	Blackmud Creek	Lower	-113.5126	53.40266	I	Left	3	40-90	15	E	buckbrush, grasses, creeping thistle	90	20	20	0	50	2	Fence impeding flow, undercut banks, slumping	Potential to Flood Farmland	No
235	Blackmud Creek	Lower	-113.513676	53.399852	I	Right	3	25	100	N	balsam poplar, buckbrush, osier red dogwood, grasses, meadow thistle	95	10	25	0	95	25	Undercut banks, slumping, erosion at toe	Stormwater Pond 40 m away	No
236	Blackmud Creek	Lower	-113.51555	53.401215	I	Left	8	40	5	E	prickly rose, buckbrush, grasses	95	0	40	0	60	20	Slumping, erosion at toe	Road 25 m away	No
237	Blackmud Creek	Lower	-113.515898	53.398643	I	Left	2	30	20	SE	balsam poplar, blue spruce, buckbrush, prickly rose, osier red dogwood, grasses, creeping thistle	99	3	17	2	80	20	Slumping	House 30 m away, trail 20 m away	No
238	Blackmud Creek	Lower	-113.517656	53.397051	I	Left	5	45	30	E	balsam poplar, trembling aspen, white spruce, wild red raspberry, osier red dogwood, Saskatoon,	95	1	52	1	90	45	Slumping	Trail 14 m away	No

Site ID	Watercourse Name	Watercourse Position	Coordinates (X)	Coordinates (Y)	Dominant Erosion Process	Bank Side	Bank Height (m)	Bank Slope (degrees)	Feature Length (m)	Site Aspect	Dominant Vegetation	Total Vegetation Cover (%)	Invasive Cover (%)	Woody Plant Cover (%)	Deadwood Cover (%)	Deep-rooted Streambank (%)	Human Alterations (%)	Signs of Erosion	Structures at Risk	Construction Access Concerns
											prickly rose, buckbrush, grasses, stinging nettle, creeping thistle									
238a	Blackmud Creek	Lower	-113.517656	53.397051	S	Left	5	45	30	E	balsam poplar, trembling aspen, white spruce, wild red raspberry, osier red dogwood, Saskatoon, prickly rose, buckbrush, grasses, stinging nettle, creeping thistle	95	1	52	1	90	45	Slumping	Trail 14 m away	No
300 (Private Property Eroded Site)	Blackmud Creek	Lower	-113.5151620	53.444718	I	Left	1	90	17	W	willow spp., grasses	100	0	1	0	0	50	Undercut banks, slumping, erosion at toe	House 30 m away	No - through private backyard
BM0 03	Blackmud Creek	Lower	-113.5336874	53.4516481	ID	Right	25	70	75	SE	white spruce, trembling aspen, balsam poplar, willow spp., buckbrush, pin cherry, wolf willow, Saskatoon, grasses	85	0	72	15	50	10	* dft pile impeding flow, slumping, erosion at toe, bedrock exposure, uprooted vegetation	Parking lot 10 m away, condos 30 m away	Yes - mass wasting, steep slope, access from road
BM0 04	Blackmud Creek	Lower	-113.5309257	53.45100575	SD	Right	25	65-90	50	SW	trembling aspen, prickly rose, buckbrush, pin cherry, grasses	50	0	50	5	0	2	Slumping, erosion at toe, bedrock exposure	Condos 65 m away, Road 40 m away	Yes - mass wasting, steep slope, access from road
BM0 05	Blackmud Creek	Lower	-113.5292689	53.44931049	SD	Right	30	50-90	75	S	trembling aspen, buckbrush, pin cherry, grasses	60	0	50	10	0	2	Slumping, erosion at toe, bedrock exposure	Trails/park upslope	Yes - mass wasting, steep slope, access from road/trail
BM0 06	Blackmud Creek	Lower	-113.5264431	53.4488058	S	Right	30	45-90	225	S/SE/SW	white spruce, trembling aspen, Saskatoon, prickly rose, buckbrush, pin cherry, grasses, flowers	60	0	60	5	15	2	Slumping, erosion at toe, bedrock exposed, uprooted vegetation	Trails 30 m away	Yes - mass wasting, steep slope, access from road/trail
BM0 07	Blackmud Creek	Lower	-113.5235107	53.44812626	S	Right	30	70-90	200	S/SE	trembling aspen, buckbrush, Saskatoon, pin cherry, red osier dogwood, grasses	60	0	30	5	0	40	Slumping, erosion at toe, bedrock exposed, uprooted vegetation	House 36 m away, road 22 m away	Yes - mass wasting, access from road
BM0 11	Blackmud Creek	Lower	-113.5141962	53.44618536	ID	Right	6	70	50	W	trembling aspen, white spruce, prickly rose, buckbrush, grasses, caraganah	60	20	41	0	0	5	Slumping	Road and houses 25 - 35 m away	Yes
BM0 13	Blackmud Creek	Lower	-113.5123294	53.44499418	S	Left	18	70	100	E	white spruce, trembling aspen, prickly rose, pin cherry, grasses, perennial sow thistle	70	0	60	1	0	2	No erosion issues recorded	No	Yes
BM0 14	Blackmud Creek	Lower	-113.51073979400	53.44117156700	SD	Left	15	45	75	E	balsam poplar, buckbrush, prickly rose, trembling aspen, grasses, perennial sow thistle	100	1	10	0	100	100	* Recent & Past Slumping	Park, private yards and trail within 25 m	No
BM0 23 / 211	Blackmud Creek	Lower	-113.50365710200	53.41675993300	I	Left	8			S	willow spp., prickly rose, buckbrush, grasses, sedges	90	0	15	10	65	1	Slumping	No	No

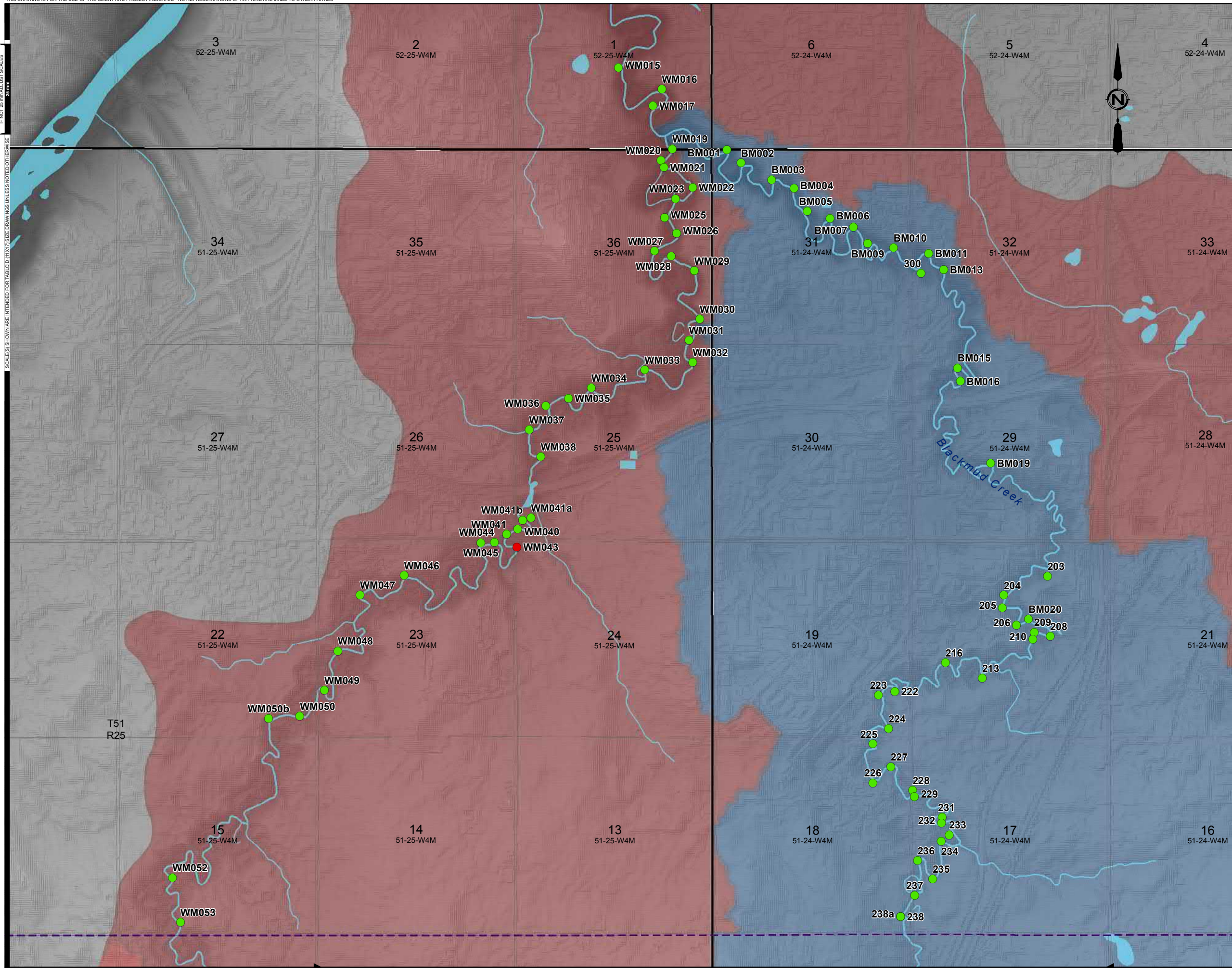
Site ID	Watercourse Name	Watercourse Position	Coordinates (X)	Coordinates (Y)	Dominant Erosion Process	Bank Side	Bank Height (m)	Bank Slope (degrees)	Feature Length (m)	Site Aspect	Dominant Vegetation	Total Vegetation Cover (%)	Invasive Cover (%)	Woody Plant Cover (%)	Deadwood Cover (%)	Deep-rooted Streambank (%)	Human Alterations (%)	Signs of Erosion	Structures at Risk	Construction Access Concerns
BM0 24 / 212	Blackmud Creek	Lower	- 113.50607053 400	53.416202374 00	I	Left	8	70	50	S	white spruce, trembling aspen, buckbrush, prickly rose, osier red dogwood, grasses	80	0	31	5	0	2	Slumping	Trail 35 m away	No
BM0 25 / 214	Blackmud Creek	Lower	- 113.50812832 100	53.416417073 00	I	Left	8	55	20	S	white spruce, buckbrush, prickly rose, Saskatoon, grasses, creeping thistle	95	1	25	1	50	2	Slumping	House 50 m away, trail 25 m away	No
BM0 26 / 215	Blackmud Creek	Lower	- 113.51104042 600	53.415801176 00	SD	Left	1.5	5		SE	white spruce, buckbrush, prickly rose, grasses, creeping thistle	100	1	100	3	80	0	Slumping	Trail 45 m away	Yes
BM0 28 / 217	Blackmud Creek	Lower	- 113.51674153 400	53.414463064 00	I	Right	2	70-80	10	N	white spruce, grasses	10	0	1	0	0	20	Slumping	Road 15 m away	No
BM0 29	Blackmud Creek	Lower	- 113.51874196 000	53.414776954 00	ID	Left	6	45	30	E	white spruce, trembling aspen, balsam poplar, prickly rose, grasses, perennial sow thistle	80	1	33	5	50	2	Slumping	Trail 16 m away	No
BM0 30 / 221	Blackmud Creek	Lower	- 113.51793073 800	53.414139405 00	ID	Right	5	60-90	100	SW	white spruce, prickly rose, grasses, creeping thistle	70	5	10	0	0	5	Undercut Banks, Slumping, Erosion at Toe	No	No
WM 006	Whitemud Creek	Lower	- 113.55533629 100	53.486138871 00	SD	Right	15	70	40	S/SW	grasses, prairie sedge, creeping thistle	45	1	0	0	0	0	Undercut banks, slumping, erosion at toe	No	No - slope could be concern
WM 007	Whitemud Creek	Lower	- 113.55262434 300	53.485472563 00	I	Right	6	70	15 + 20	W	balsam poplar, white spruce, white birch, pin cherry, red osier dogwood, prickly rose, aster spp., grasses, common tansy, perennial sow thistle, creeping thistle	50	6	16	20	0	5	Erosion at toe, bedrock exposure, uprooted vegetation	Outfall	No
WM 007b	Whitemud Creek	Lower	- 113.55459090 000	53.484077100 00	I	Left	4	90	10	SE	trembling aspen, white spruce, willow spp., prickly rose, buckbrush, Saskatoon, red osier dogwood, pincherry, grasses, asters, common tansy, perreniel sow thistle, creeping thistle	85	4	85	1	50	95	Slumping, uprooted vegetation	Campground, Road, Outfall	No
WM 009	Whitemud Creek	Lower	- 113.55346864 000	53.476821773 00	SD	Right	40	45	140	S/SW	trembling aspen, buckbrush, prickly rose, grasses, prairie sage, perennial sow thistle	20	2	8	10	0	5	Slumping, Erosion at toe	Upslope House	No - slope could be concern
WM 009b	Whitemud Creek	Lower	-113.555417	53.473466	ID	Right	15	70	45	W/NW	white spruce, lodgepole pine, trembling aspen, prickly rose, red osier dogwood, alder, Saskatoon, grasses	20	0	17	2	0	2	Slumping	Trails 35 m away	Yes - Steep banks and forested, but trail present
WM 010 (W M00 9b on field	Whitemud Creek	Lower	- 113.56381509 500	53.472690074 00	ID	Left	40	70-90	160	E/SE	trembling aspen, white spruce, prickly rose, buckbrush, wolf willow, grasses	20	0	18	1	100	0	Slumping, erosion at toe, bedrock exposure, uprooted vegetation	House 30 m away	No - access through private backyards and trail

Site ID	Watercourse Name	Watercourse Position	Coordinates (X)	Coordinates (Y)	Dominant Erosion Process	Bank Side	Bank Height (m)	Bank Slope (degrees)	Feature Length (m)	Site Aspect	Dominant Vegetation	Total Vegetation Cover (%)	Invasive Cover (%)	Woody Plant Cover (%)	Deadwood Cover (%)	Deep-rooted Streambank (%)	Human Alterations (%)	Signs of Erosion	Structures at Risk	Construction Access Concerns
form )																				
WM 011	Whitemud Creek	Lower	-113.55728435500	53.46887009100	S	Right	40	50	100	S/SW	blue spruce, trembling aspen, manitoba maple, Saskatoon, buckbrush, prickly rose, grasses	15	2	8	1	0	25	Slumping, erosion at toe, bedrock exposure, uprooted vegetation	Upslope House 20 m away	Yes - steep and private dwelling
WM 012	Whitemud Creek	Lower	-113.55190254900	53.46688567800	SD	Right	30	40	90	W/SW	trembling aspen, white spruce, white birch, prickly rose, buckbrush, pin cherry, red osier dogwood, Saskatoon, grasses, perennial sow thistle	80	1	41	1	0	5	Slumping	Upslope House 35 m away	Yes - access through backyards only
WM 012b	Whitemud Creek	Lower	-113.549349	53.464442	S	Left	30	45	90	E	white spruce, white birch, trembling aspen, alder spp., red osier dogwood, prickly rose, willow spp., bearberry	34	0	33	5	0	5	Slumping, seepage, uprooted vegetation	Upslope House setback 35 m from top of ridge	No - paved trail behind residences
WM 013	Whitemud Creek	Lower	-113.54934887900	53.46444162100	SD	Right	29	70	260	S	balsam poplar, trembling aspen, white spruce, willow, red osier dogwood, buckbrush, grasses	75	0	25	0	50	30	Slumping	Upslope house nearby	No - access through ROW or yard
WM 037	Whitemud Creek	Lower	-113.563781	53.43312483	SD	Left	3	5	0	E/SE	prickly rose, alder sp., red osier dogwood, willow spp., buckbrush, sedges, grasses	100	15	65	0	100	100	Outfall with heavy riprap	Outfall and drainage utilities	No
WM 041	Whitemud Creek	Lower	-113.5665289	53.42538527	ID	Left	12	60	95	S/SE	trembling aspen, balsam poplar, white spruce, buckbrush, prickly rose, grasses, perennial sow thistle, creeping thistle	40	4	17	20	0	5	Undercut banks, slumping, seepage, erosion at toe, uprooted vegetation	20 m downstream of Ellerslie Road, Clearing/ Future Development, Road	No
WM 041a	Whitemud Creek	Lower	-113.563506	53.426593	S	Right	10	30	100	all	white spruce, trembling aspen, prickly rose, osier red dogwood, grasses, common tansy	5	0	0	1	100	100	Bedrock exposure, uprooted vegetation	Anthony Henday Highway	No
WM 041b	Whitemud Creek	Lower	-113.564552	53.426418	S	Right	2-4	5	40	NW	white spruce, trembling aspen, prickly rose, osier red dogwood, grasses	20	5	1	1	100	100	Bedrock exposure	Anthony Henday Highway	
WM 044	Whitemud Creek	Lower	-113.5680724	53.42477329	ID	Left	8	70	150	S/SW	trembling aspen, red osier dogwood, wolf willow, grasses, perennial sow thistle	50	1	9	2	0	25	Slumping	Ellerslie Road < 2 m away	No
WM 045	Whitemud Creek	Lower	-113.569746	53.42472282	ID	Left	15	unknwn	unknwn	S/SE	trembling aspen, red osier dogwood, wolf willow, grasses, perennial sow thistle	50	1	9	2	0	25	Slumping	Ellerslie Road < 2 m away	No
WM 048	Whitemud Creek	Lower	-113.5874583	53.41670584	ID	Left	18	60-90	130	S/SE	trembling aspen, white spruce, wolf willow, prickly rose, pin cherry, grasses, perennial sow thistle, lamb's quarters	20	1	19	1	15	5	Slumping, erosion at toe, bedrock exposure	Private yard - house set 30 m back from top of ridge, Barn near ridge	Landowner concern

IF NOT AS SHOWN IN THIS DRAWING, ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE NOTED

SCALE(S) SHOWN ARE INTENDED FOR TABLED (1:1) SIZE DRAWINGS UNLESS NOTED OTHERWISE

P:\2016\3785\00\_Blackmud\Working\_Dwg\010\_GIS\Act\Map01\_Environmental\Maping\_ErosionSiteLocations.mxd  
 DATE: 10/5/2016



**Legend:**

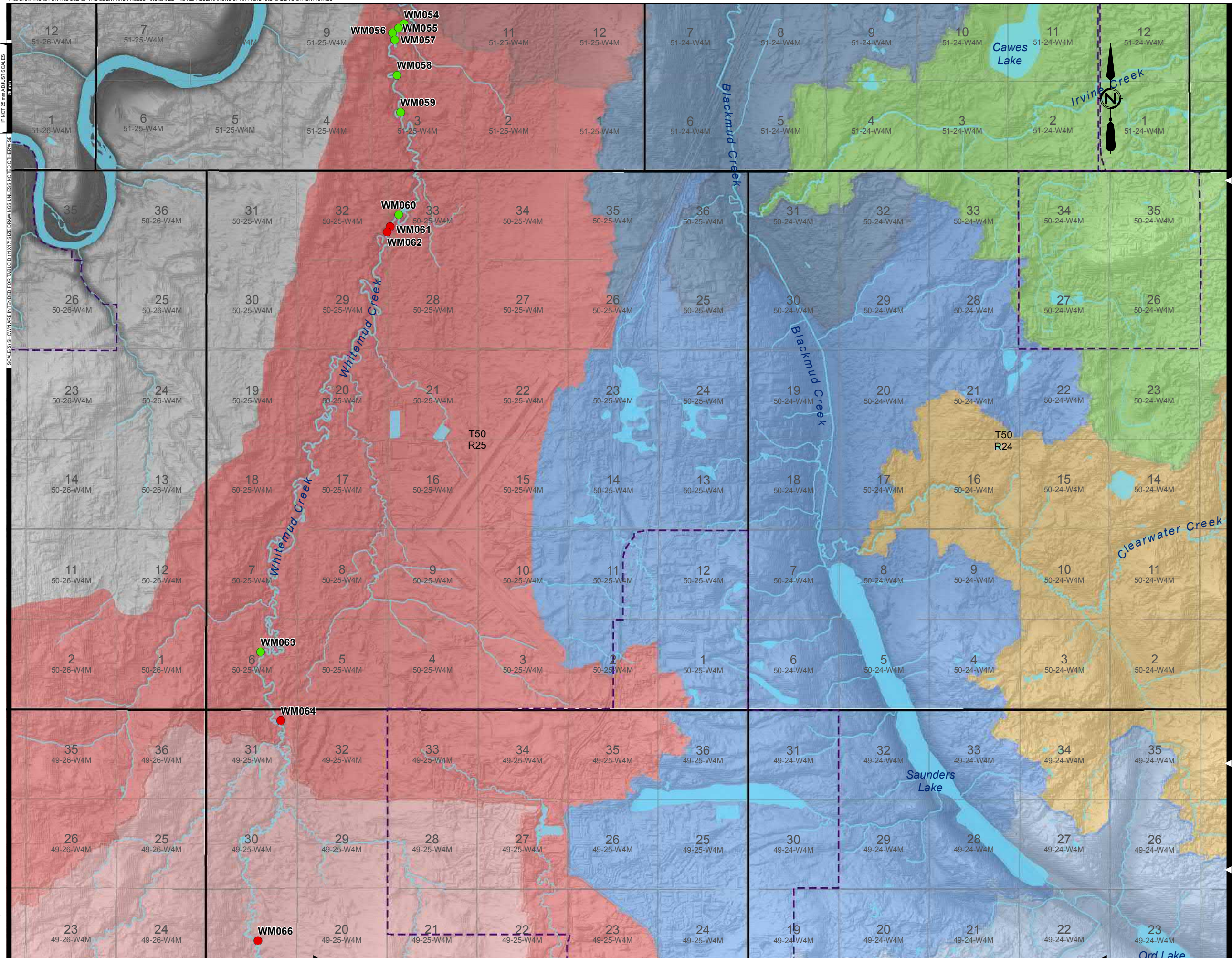
- Erosion Site Location
- Visited
  - Not Visited
- Watershed - SubAreas
- Blackmud-Lower
  - Blackmud-Middle
  - Blackmud-Upper
  - Clearwater-Lower
  - Clearwater-Upper
  - Irvine-Lower
  - Irvine-Upper
  - Whitemud-Lower
  - Whitemud-Middle
  - Whitemud-Upper

**FIGURE No. B-1**

BLACKMUD/WHITEMUD CREEK  
WATERSHED MANAGEMENT STUDY

EROSION SITE LOCATIONS

AE PROJECT No.	2016-3785
SCALE	1:30,000
APPROVED DATE	2016 OCTOBER
REV DESCRIPTION	ISSUED FOR REPORT



- Legend:**
- Erosion Site Location**
- Visited
  - Not Visited
- Watershed - SubAreas**
- Blackmud-Lower
  - Blackmud-Middle
  - Blackmud-Upper
  - Clearwater-Lower
  - Clearwater-Upper
  - Irvine-Lower
  - Irvine-Upper
  - Whitemud-Lower
  - Whitemud-Middle
  - Whitemud-Upper

**FIGURE No. B-2**  
**BLACKMUD/WHITEMUD CREEK**  
**WATERSHED MANAGEMENT STUDY**  
**EROSION SITE LOCATIONS**

<b>AE PROJECT No.</b>	2016-3785
<b>SCALE</b>	1:65,000
<b>APPROVED DATE</b>	2016 OCTOBER
<b>REV DESCRIPTION</b>	ISSUED FOR REPORT

# TECHNICAL MEMORANDUM

## Appendix C – Erosion Site Photos







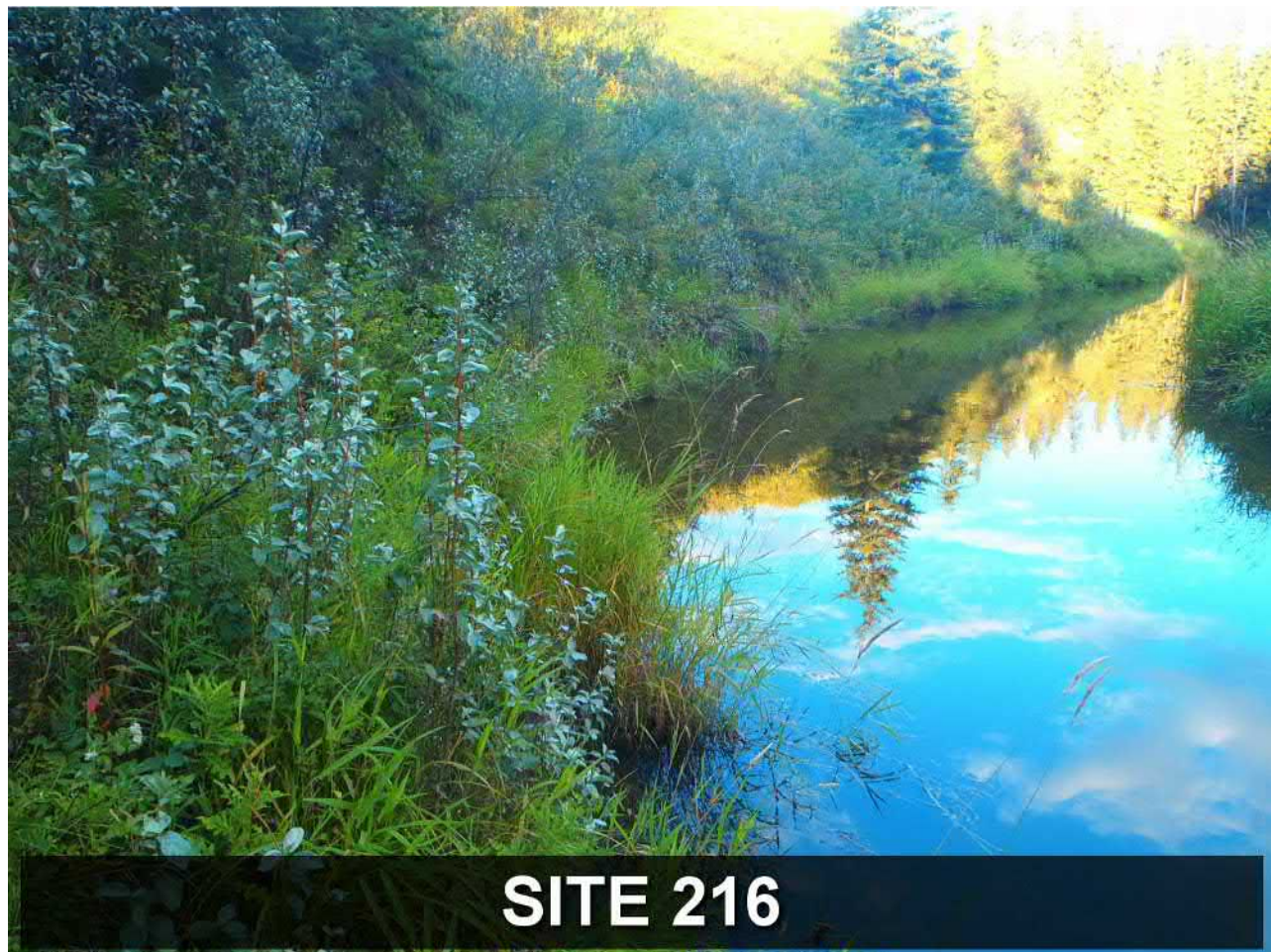
























**SITE 231**



**SITE 232**





**SITE 235**



**SITE 236**



**SITE 237**

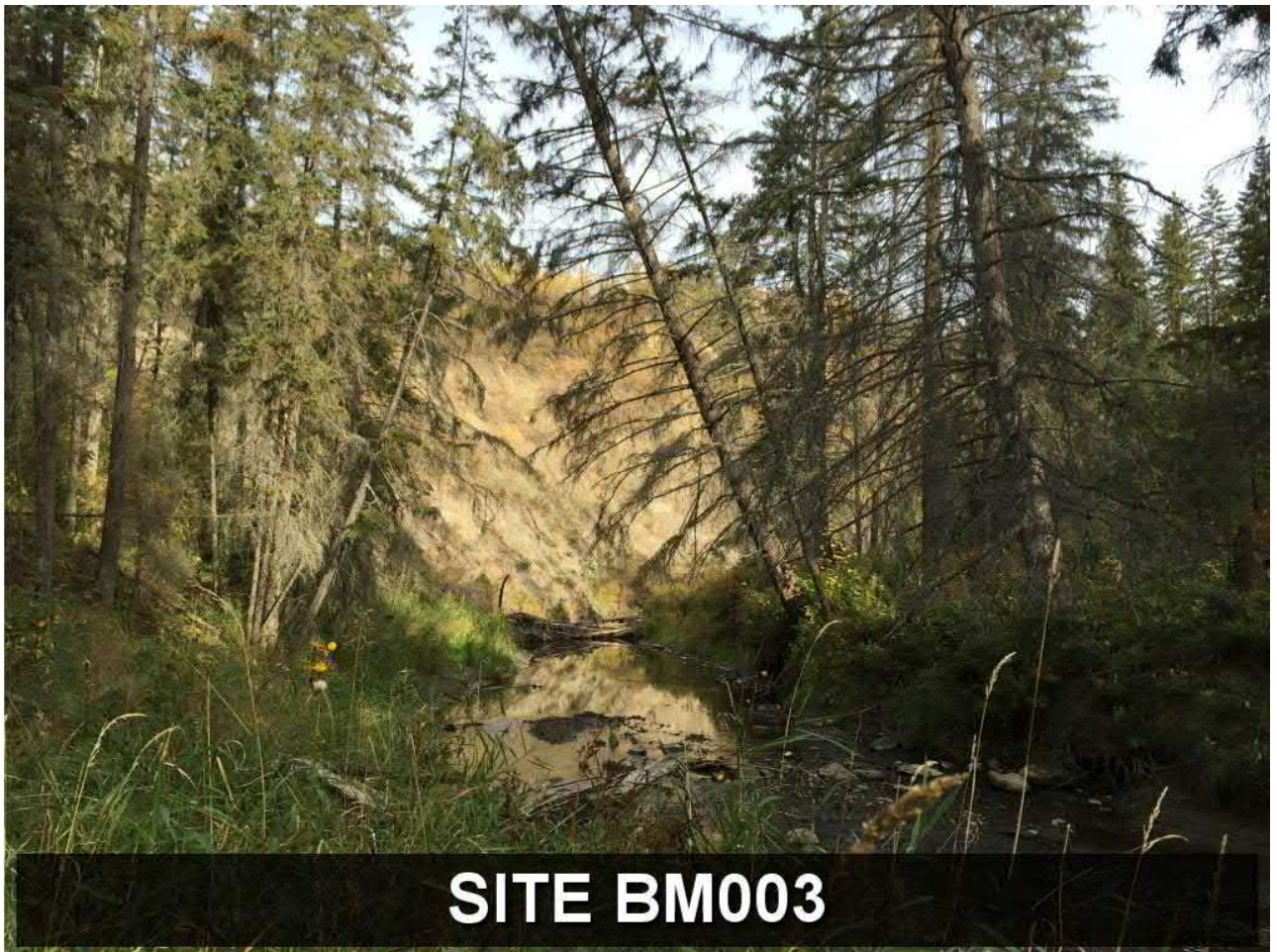


**SITE 238**





**SITE 300**



**SITE BM003**

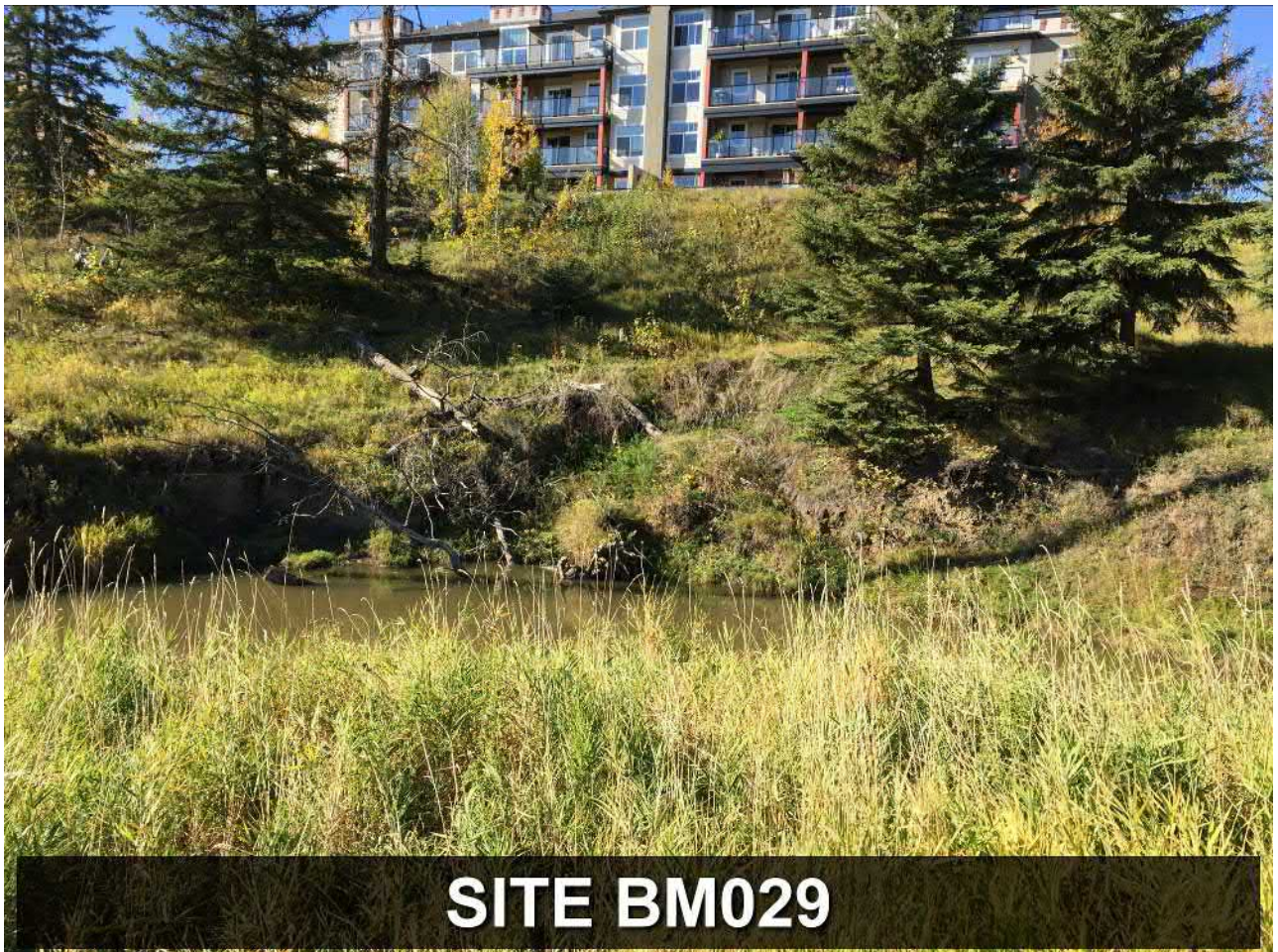








**SITE BM014**



**SITE BM029**





**SITE WM007b**

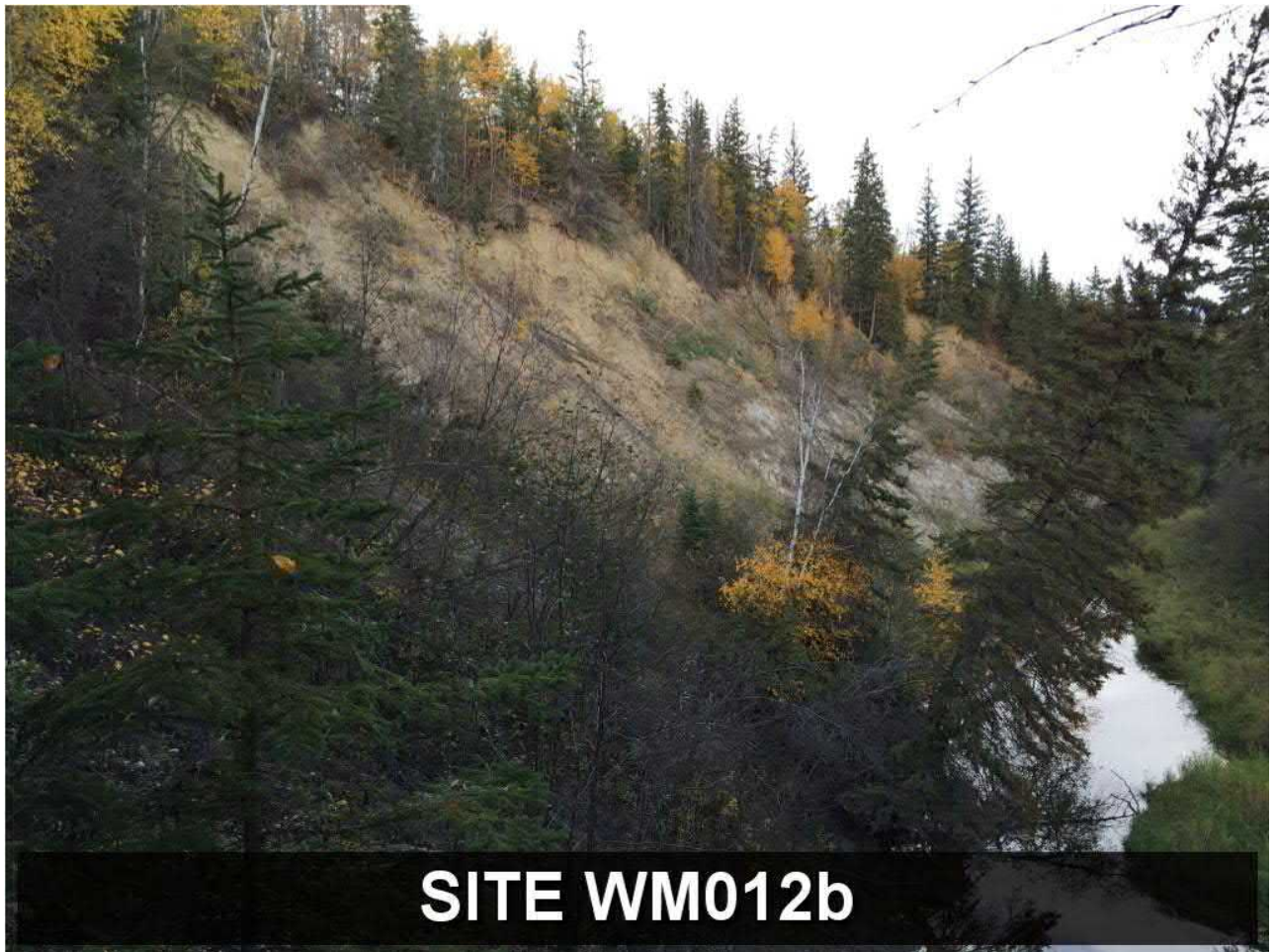


**SITE WM009**













**SITE WM041a**



**SITE WM041b**





**SITE WM048**

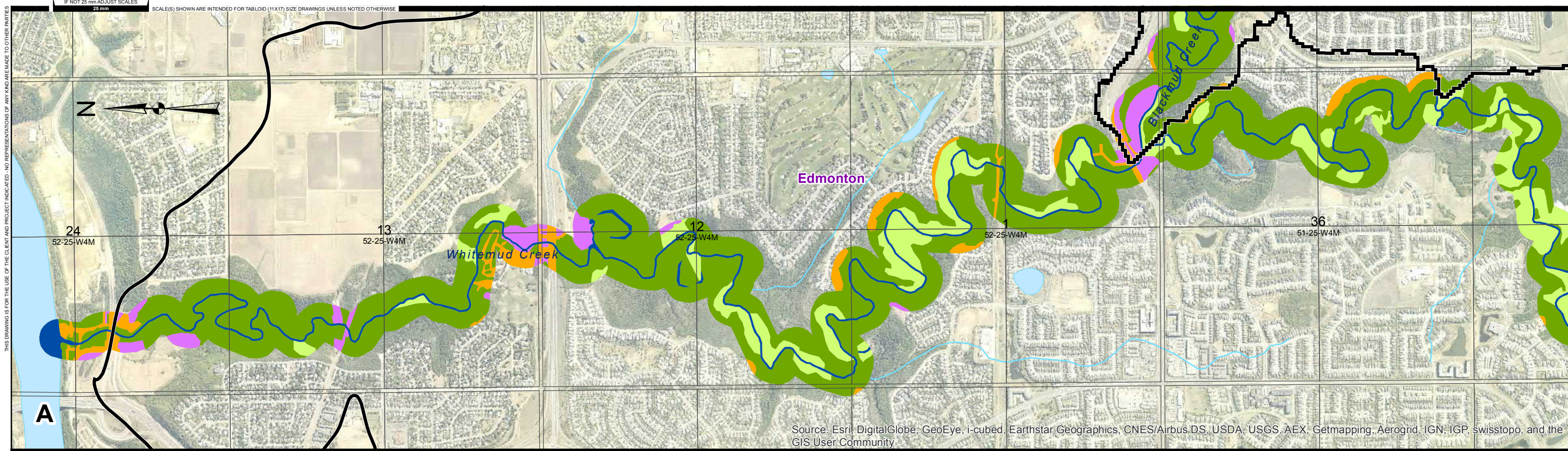
# TECHNICAL MEMORANDUM

## Appendix D – Riparian Characteristic Maps

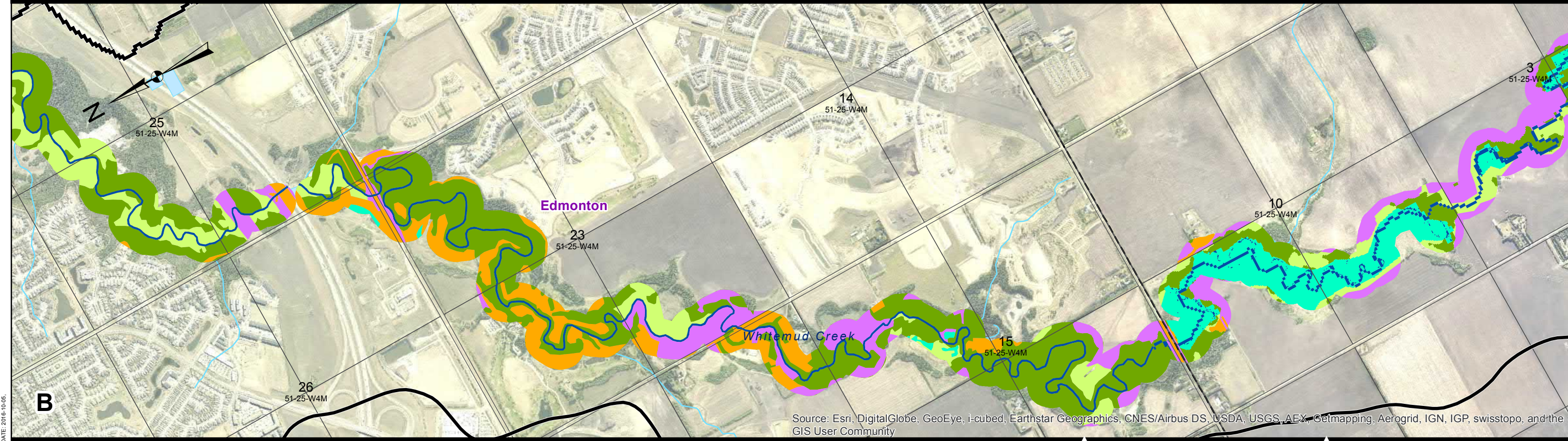




IF NOT 25 mm ADJUST SCALES  
25 mm  
SCALE(S) SHOWN ARE INTENDED FOR TABLOID (11X17) SIZE DRAWINGS UNLESS NOTED OTHERWISE



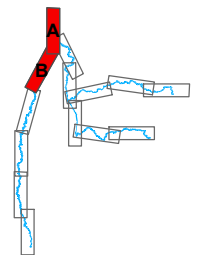
Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

**Legend:**

- Developed
- Semi-Natural
- Open Natural
- Forested
- Wetland
- Open Water

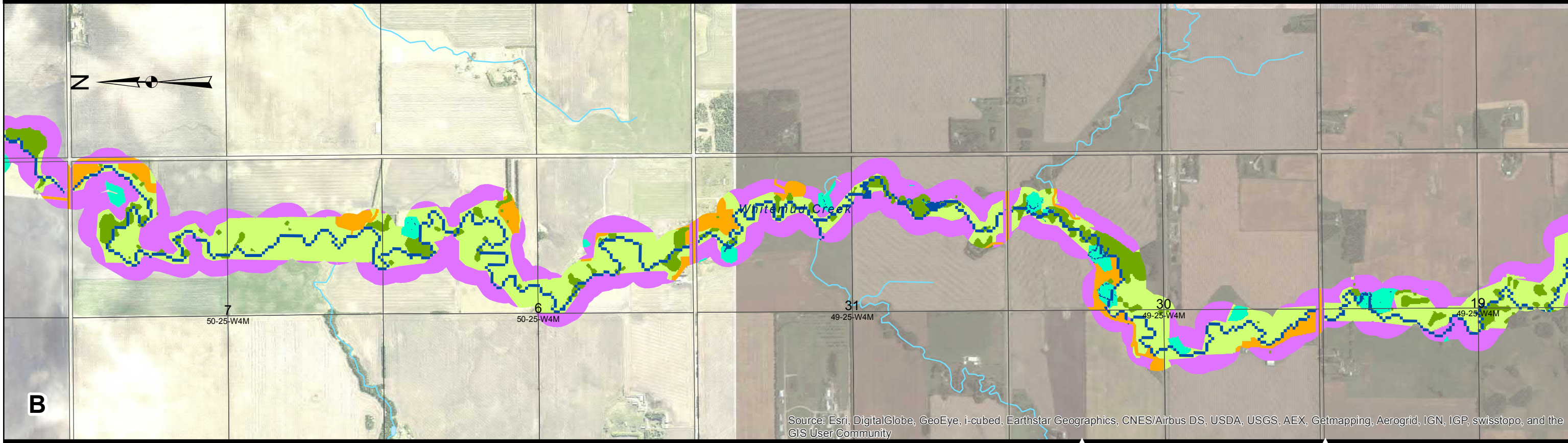
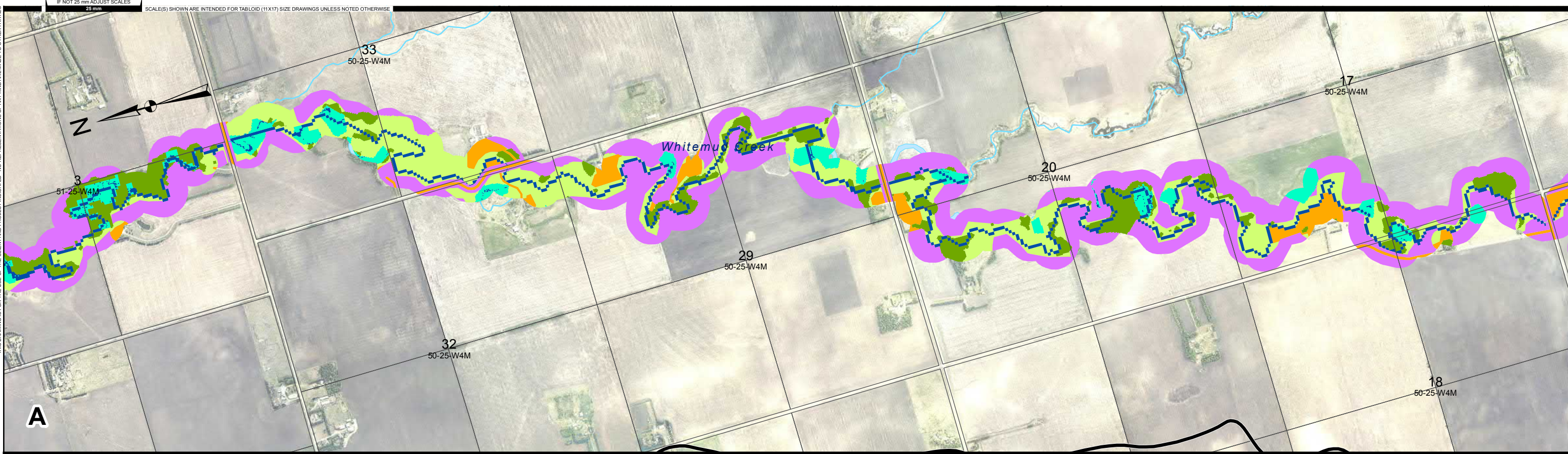


AE PROJECT No.	2016-3785
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**FIGURE No. D-1**  
BLACKMUD/WHITEMUD CREEK  
WATERSHED MANAGEMENT STUDY  
ENVIRONMENTAL  
RIPARIAN CHARACTERISTICS  
WITHIN 100 m OF CREEKS

I:\admin\fs-1\hnp\2016\3785\00\_Blackmud\_Whitemud\Working\_Dwg\010\_GIS\AcMap01\_EnvironmentalMap\_AM\_LandCover\_100m\_DDF.mxd  
 DATE: 2016-10-05

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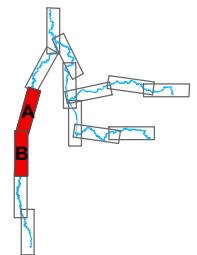


Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



**Legend:**

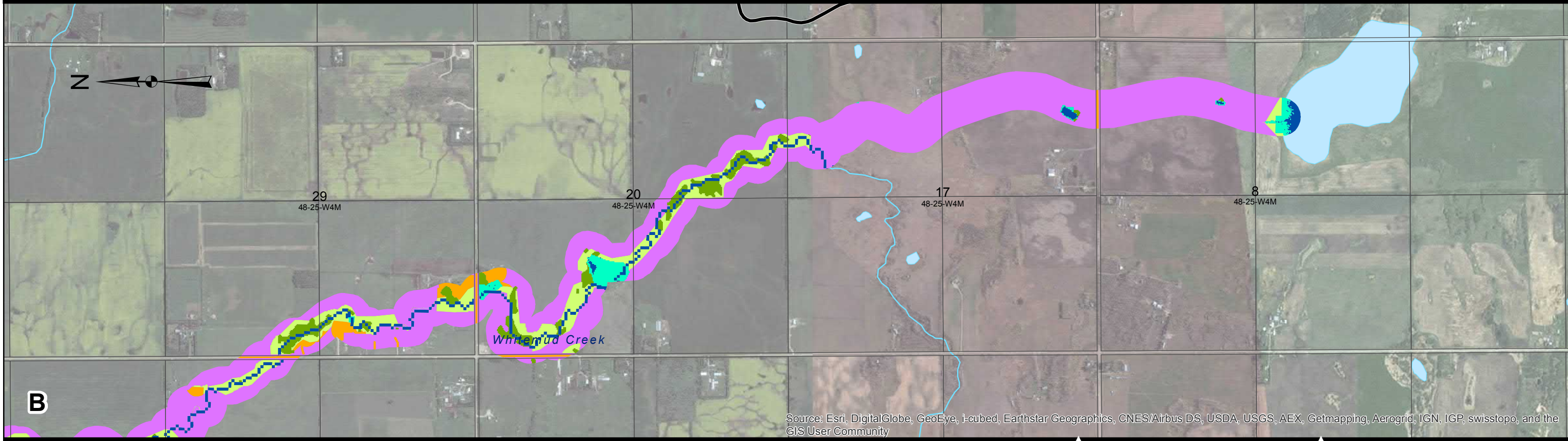
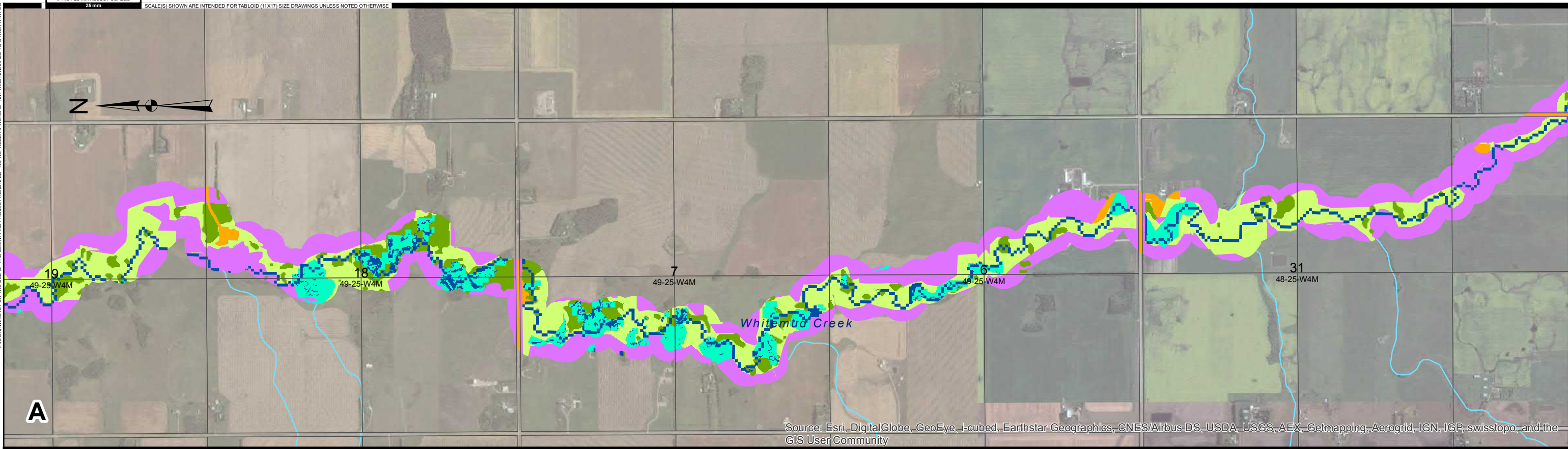
- Developed
- Semi-Natural
- Open Natural
- Forested
- Wetland
- Open Water



<b>AE PROJECT No.</b>	2016-3785
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<b>REV</b>	
<b>DESCRIPTION</b>	ISSUED FOR REPORT

**FIGURE No. D-2**  
 BLACKMUD/WHITEMUD CREEK  
 WATERSHED MANAGEMENT STUDY  
 ENVIRONMENTAL  
 RIPARIAN CHARACTERISTICS  
 WITHIN 100 m OF CREEKS

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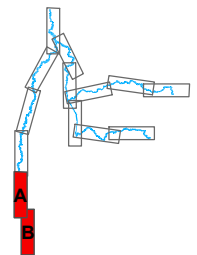


I:\admin\fs-01\proj\2016\3785\00\_Blackmud\_Whitemud\Working\_Dwg\010\_GIS\AcMap01\_EnvironmentalMap\_AM\_LandCover\_100m\_DDF.mxd  
DATE: 2016-10-06



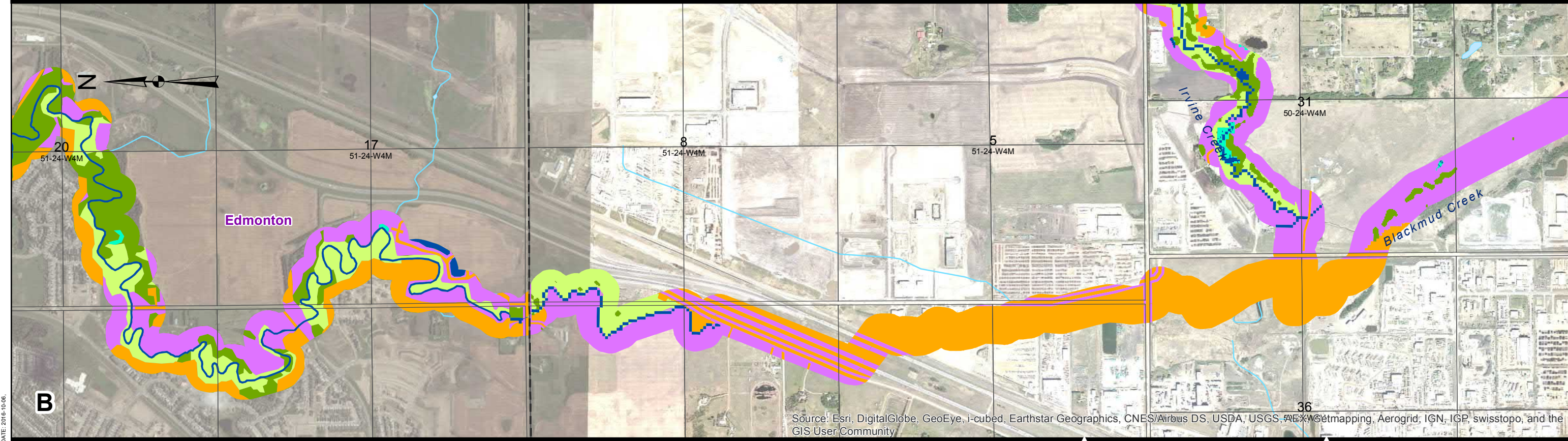
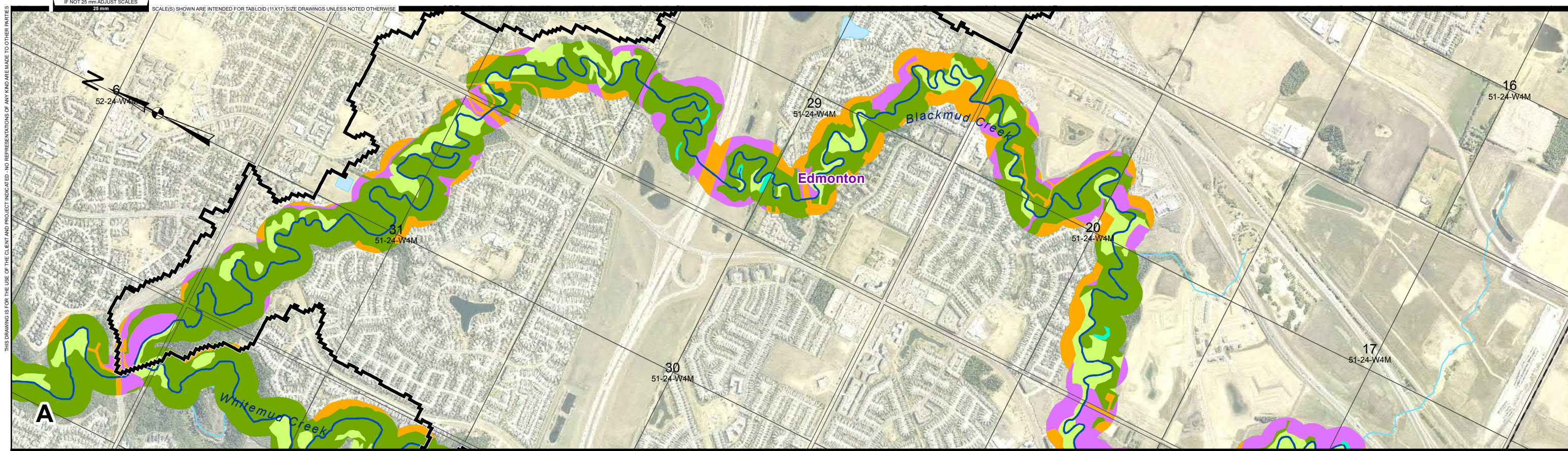
**Legend:**

- Developed
- Semi-Natural
- Open Natural
- Forested
- Wetland
- Open Water



<b>AE PROJECT No.</b>	2016-3785
<b>SCALE</b>	1:20,000
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<b>DATE</b>	2016 OCTOBER
<b>REV</b>	
<b>DESCRIPTION</b>	ISSUED FOR REPORT

**FIGURE No. D-3**  
BLACKMUD/WHITEMUD CREEK  
WATERSHED MANAGEMENT STUDY  
ENVIRONMENTAL  
RIPARIAN CHARACTERISTICS  
WITHIN 100 m OF CREEKS



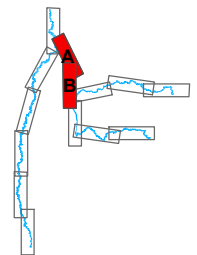
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 DATE: 2016-10-06

Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, IGP, swisstopo, and the GIS User Community



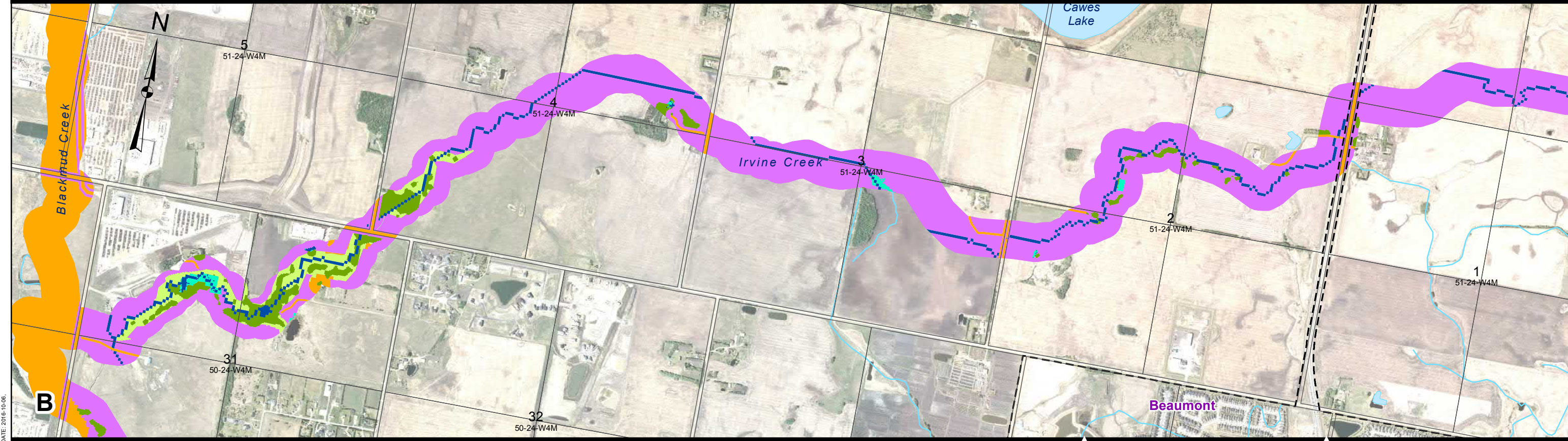
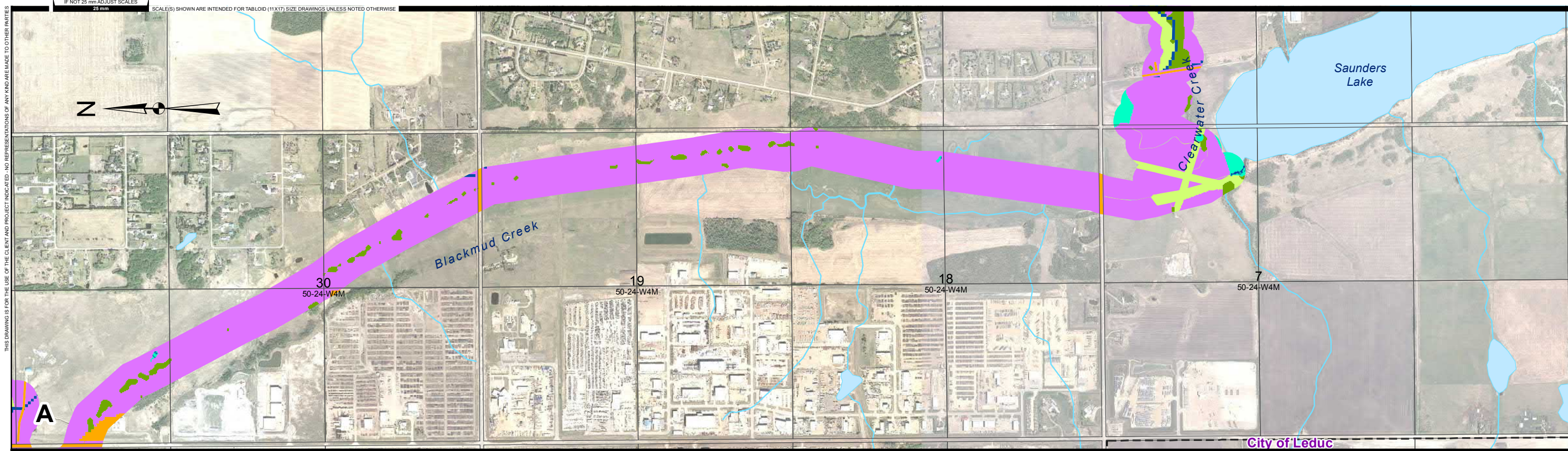
**Legend:**

- Developed
- Semi-Natural
- Open Natural
- Forested
- Wetland
- Open Water



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**FIGURE No. D-4**  
 BLACKMUD/WHITEMUD CREEK  
 WATERSHED MANAGEMENT STUDY  
 ENVIRONMENTAL  
 RIPARIAN CHARACTERISTICS  
 WITHIN 100 m OF CREEKS

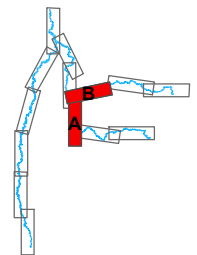


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DATE: 2016-10-06



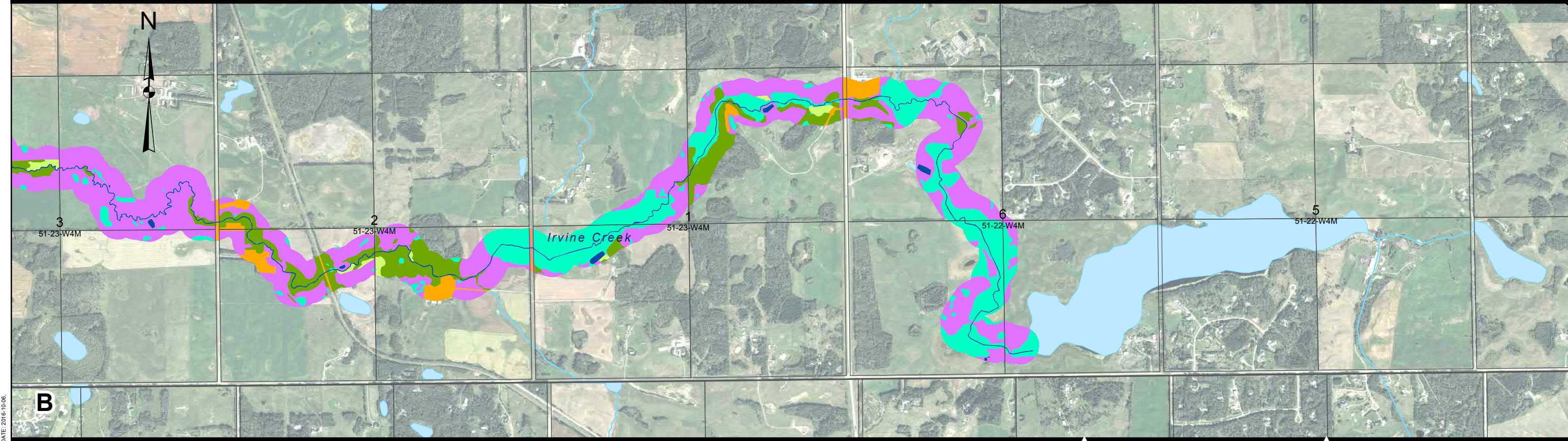
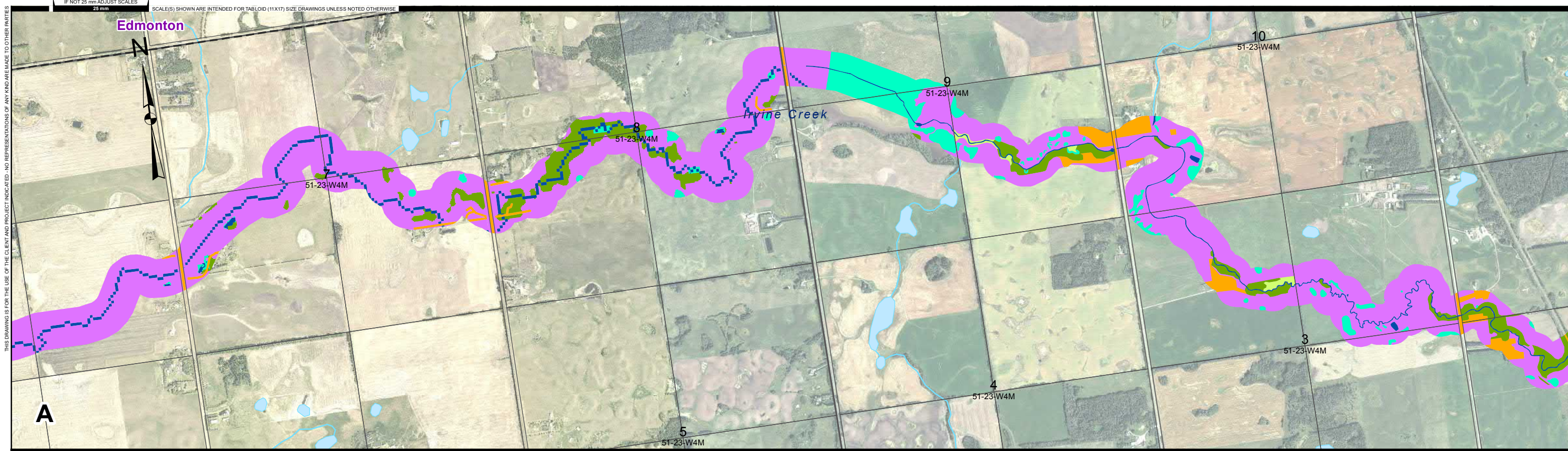
**Legend:**

- Developed
- Semi-Natural
- Open Natural
- Forested
- Wetland
- Open Water



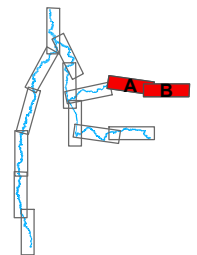
AE PROJECT No.	2016-3785
SCALE	1:20,000
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DATE	2016 OCTOBER
REV	
DESCRIPTION	ISSUED FOR REPORT

**FIGURE No. D-5**  
BLACKMUD/WHITEMUD CREEK  
WATERSHED MANAGEMENT STUDY  
ENVIRONMENTAL  
RIPARIAN CHARACTERISTICS  
WITHIN 100 m OF CREEKS



**Legend:**

- Developed
- Semi-Natural
- Open Natural
- Forested
- Wetland
- Open Water



AE PROJECT No.	2016-3785
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DESCRIPTION	ISSUED FOR REPORT

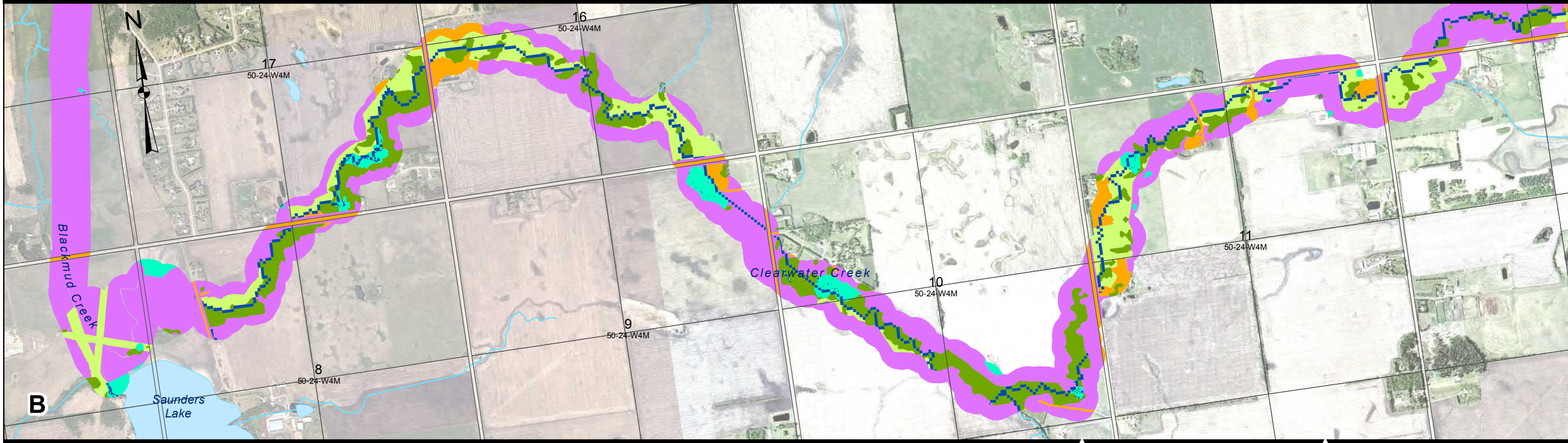
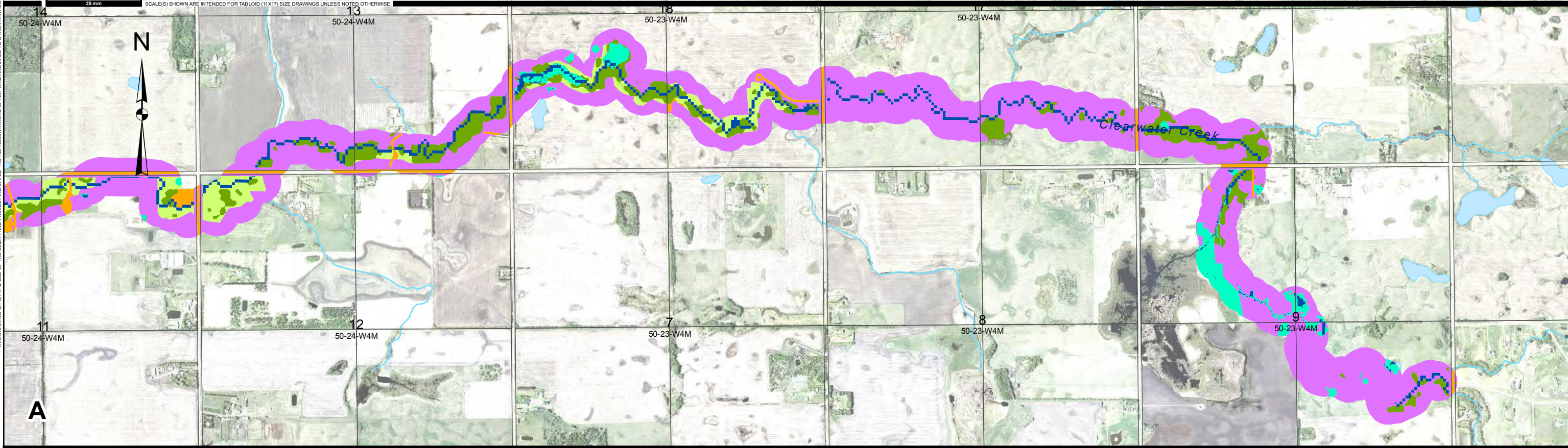
**FIGURE No. D-6**  
BLACKMUD/WHITEMUD CREEK  
WATERSHED MANAGEMENT STUDY  
ENVIRONMENTAL  
RIPARIAN CHARACTERISTICS  
WITHIN 100 m OF CREEKS

I:\admin\fs-01\projects\2016\3785\00\_Blackmud\_Whitemud\Working\_Dwg\010\_CIS\AcMap01\_EnvironmentalMap\_AM\_LandCover\_100m\_DDF.mxd  
 DATE: 2016-10-06

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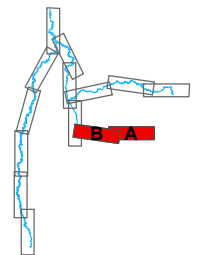
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**Legend:**

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- Semi-Natural
- Open Natural
- Forested
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**FIGURE No. D-7**  
BLACKMUD/WHITEMUD CREEK  
WATERSHED MANAGEMENT STUDY  
ENVIRONMENTAL  
RIPARIAN CHARACTERISTICS  
WITHIN 100 m OF CREEKS