MAP GUIDELINE

This document provides information to help Operators assemble permit maps and boundary coordinates that meet the requirements of the Opencut Mining Act (MCA Title 82, chapter 4, part 4) and its implementing rules (ARM Title 17, chapter 24, subchapter 2). The primary purpose of the maps and coordinates is to document and display the site's physical location and approved permit boundaries. The maps also display existing and proposed features of the site, the surrounding area, and the proposed operation. The maps are critical components of the permit application and constitute legal documents that become part of the permit.

Section I - Boundary Coordinate Requirements

The Opencut Mining Section accepts maps drawn accurately to scale by an Operator or consultant if the maps are based on boundary coordinates obtained using a Global Positioning System (GPS) unit and/or accompanying mapping software. Alternatively, maps must be drawn accurately to scale by a licensed land surveyor. In either case, the requirements below apply. Maps submitted must display boundaries and lines that match those created from the coordinates supplied on the Boundary Coordinate Table (BCT). The BCT is an excel spreadsheet that must be filled out with the latitude and longitude of each vertex of the proposed boundary. The BCT is then submitted to DEQ as an excel file and DEQ runs it through their software to create the proposed boundary for review with the application. Once the application is deemed complete, the operator can view the proposed boundary on DEQ's Public Facing WMA found here: https://gis.mtdeq.us/portal/apps/webappviewer/index.html?id=7b60084bc4c444a19c9a7a0867e7635a

1. **Maps and boundary coordinates must define the following areas (see attached Example 1–Site Map):**
   a. Existing permit (if not previously defined by BCT) or new proposed permit boundaries
   b. Proposed Non-Bonded Areas (note: there is no "Bonded BCT")
   c. Existing Permitted Access Roads (if not previously defined by BCT) or Proposed Permitted Access Roads
   d. Existing Phase I Release Areas (if not previously defined by BCT) or Proposed Phase I Release Areas
   e. Proposed Phase II Release Areas

2. **Boundary coordinates must be provided as necessary to define the following boundary or line segments:**
   a. Each vertex/corner (change in direction) of the permit or the new proposed permit boundary;
   b. Non-Bonded, Phase I and Phase II Release areas (each corner or change of direction);
   c. The centerline of permitted access road(s) that delineates the start and end points, and approximate locations of corners and curves. (Note: One end of the permitted access road must terminate at the permit boundary (i.e. where it meets the proposed/existing boundary) and the other end of the permitted access road must terminate at a public road.)

3. **Submit boundary coordinates to the Opencut Mining Section as follows:**
   a. Operator Provided Coordinates must be provided in **WGS 84 Decimal Degrees**. No other coordinate system will be accepted.
   b. Provide coordinates in the Microsoft Excel *Boundary Coordinate Table* available at: https://deq.mt.gov/mining/assistance (click on the "Opencut Mining Forms" tab).
   c. Coordinates must be listed in geographic sequence, so clear boundaries result from connecting Map ID #1 to Map ID #2 to Map ID #3, etc. (refer to examples below).
   d. Each operator provided coordinate and its associated Map ID # must be displayed on the Site Map. For example, P1, P2, P3, etc. for Permit boundaries; N1, N2, N3, etc., for Non-bonded boundaries, etc.
   e. Email the Microsoft Excel *Boundary Coordinate Table* to DEQOpencut@mt.gov with the "Subject" line completed as follows: **BCT (Operator-Site Name)**.

f. The Microsoft Excel table is used electronically by the Opencut Mining Section to assess and verify proposed boundaries. As a result, do not include a printout of the table in the paper application or a PDF in a digital application submitted to the Opencut Mining Section's Helena office.

Section II - Map Criteria

1. The Opencut Mining Section requires that the Site Map, Area Map and Reclamation Map be drawn on the most current air photo base (only the Location Map is required for the *Dryland Opencut Mining Permit Application*). The most current air photo base is available at various internet websites including, but not limited to:
   - Opencut Mining Public WMA https://gis.mtdeq.us/portal/apps/webappviewer/index.html?id=7b60084bc4c444a19c9a7a0867e7635a click on the "Web Mapping Application" tab
2. Create a Site Map at a readable scale that is zoomed in as close as possible to the proposed permit boundary so the proposed boundary fills the map space and shows details within the boundary. It is more important to ensure the site map is zoomed in as close to the proposed permit boundary as possible than it is to also display the entire length of the access road on the Site Map. The entire length of access road in relation to the permit boundary can be displayed on the Area Map.
3. Create an Area Map at an appropriate scale to show all pertinent features within 1,000 feet of the proposed permit boundary and within 500 feet of any permitted access road.
4. Create a Reclamation Map to show the postmining topography (i.e. ideally with contour lines, but minimally with arrows indicating drainage/flow/sheet flow direction), each proposed postmining land use, the area(s) where it will occur, and other applicable features that will remain at the site when reclamation is completed. Ensure the Reclamation Map is zoomed in as close to the proposed permit boundary as possible.
5. Create a Location Map to show the site's location in relation to the nearest town to allow the public to locate the proposed site [MCA 82-4-432(2)(a)(iv) & 82-4-432(5)(c) & 82-4-432(14)(a)(viii)]. Label roads from the nearest town to the site. The Location Map can be shown on an aerial photo or topographic background.
6. No required map information can be within ½-inch of the sheet edge.
7. Unless submitted in electronic format through the Montana File Transfer Service (preferred), maps must be submitted on 8 ½ in x 11in paper or as otherwise approved by the Department.
8. Each map must include the information listed below.

Section III - Map Labels & Features

ALL MAPS –The map must include the following items:

1. Map Title
2. Operator Name
3. Site Name
4. Bar Scale
5. Date of Drafting
6. North Arrow
7. Legend identifying features not directly labeled on the map
   a. **Note:** Legends are a useful tool used to explain what the symbols and line types denoted on a map represent. A legend defines the symbols or colors used on the map (including dots, dashes, lines, etc.). It must be clear what each marker or line type, weight and pattern represents. Text **cannot** be used in lieu of displaying the symbol in the legend (e.g. "black line = stockpile" & "green dot = soil test pit"; are not acceptable). In addition, do not use shading or cross hatching that obscures the photo beneath on the Site or Area maps as it reduces the ability to view the aerial background. Shading and cross hatching can be used on Reclamation Maps as any aerial photo will likely not represent the future state of the site. Shading and cross hatching can also be used on Location Maps as an aerial background is not required or specifically relevant to the purpose of the map.

SITE MAP (not required for *Dryland Opencut Mining Permit Application but can be submitted to help clarify the Dryland application)* - Must show and identify the following existing and proposed features as applicable (do not use shading or cross hatching):

1. Site maps must show and identify the following existing and proposed features as applicable:
   a. permitted access roads (unless shown on Area Map due to length of access road), including the location, width, waterway crossings, and surfacing;
   b. permit boundaries;
      i. bonded area boundary;
      ii. non-bonded area boundary;
   c. Map ID # that corresponds to the BCT for each boundary or line type listed above;
   d. excess overburden and fines disposal sites;
   e. staging areas;
   f. heavy equipment parking areas;
   g. fuel storage areas;
   h. sight and sound barriers and berms;
   i. soil stockpile areas;
   j. overburden and excess overburden stockpile areas;
   k. material stockpile areas;
   l. processing facilities, including approximate locations of:
      i. crusher;
      ii. asphalt plant;
      iii. wash plants; and
      iv. concrete plant;
   m. detention/retention ponds;
   n. concrete and asphalt recycling stockpile area;
   o. soil and overburden test hole and observation point locations;
   p. water system and structures, including:
      i. supply wells;
      ii. water recycling and settling ponds;
      iii. surface water extraction points;
      iv. discharge points for water used in opencut operations; and
      v. all surface waters including, but not limited to, ponds, lakes, wetlands, and defined and/or eroded channels of waterways including, but not limited to, rivers, creeks, intermittent or perennial streams, drainages, ditches, water conveyance facilities, and other waterways;
   q. above and below ground utilities and easements within the permit boundary;
   r. roads crossing areas where opencut activities are prohibited (i.e. easements) by ARM 17.24.218(1)(g);
   s. erosion controls;
   t. historic disturbances within or adjacent to permit area boundary;
   u. any other pertinent features that are necessary to ensure compliance with the Act and rules.

AREA MAP (not required for *Dryland Opencut Mining Permit Application but can be submitted to help clarify the Dryland application)* - Must show and identify the following features within 1,000 feet outside of the permit boundary and within 500 feet of an access road included in the permit(Do not use shading or cross hatching):

   a. roads leading to the site (include road names);
   b. permitted access roads from the public road turnoff to the permit area (if roads go beyond the area map, show the full extent on the location map) including the location, width, waterway crossings, and surfacing;
   c. access routes (if no access road will be included in the permit)
   d. water wells based on readily available information, and other water conveyance facilities;
   e. natural and man-made drainage/waterway features, with defined channels or surface water margins including, but not limited to, intermittent or perennial streams, wetlands, ponds, springs, ditches, and

impoundments. Show the defined and/or eroded channel of any such feature and any setback areas, along with a description of the use of any man-made feature;
f. other opencut operations;
g. significant geographical features;
h. residences located within 300 feet of the permit boundary; and
i. any other pertinent features that are necessary to ensure compliance with the Act and this subchapter

RECLAMATION MAP (not required for *Dryland Opencut Mining Permit Application)* - The intent of this map is to show and label features that will remain at the site when reclamation is completed (i.e. how it will look at final reclamation). A Reclamation Map is required to clearly show the following postmining reclamation features (use of shading is acceptable):

a. all postmining land uses;
b. mined area backfill sites (i.e. anywhere the floor will use backfill to achieve the necessary postmining elevation and/or anywhere backfill will be used to create final slopes);
c. landowner material stockpile areas to remain;
d. all roads or portions of roads proposed to remain open, at the request of the landowner, at the conclusion of opencut operations, including road locations, intended use, final width, and surfacing;
e. long and short axis cross-sections of any pond or depression in which water is expected to collect;
f. arrows depicting the anticipated direction of water flow across the reclaimed site (or postmining contours); and
g. any other pertinent features that are necessary to ensure compliance with the Act and this subchapter.

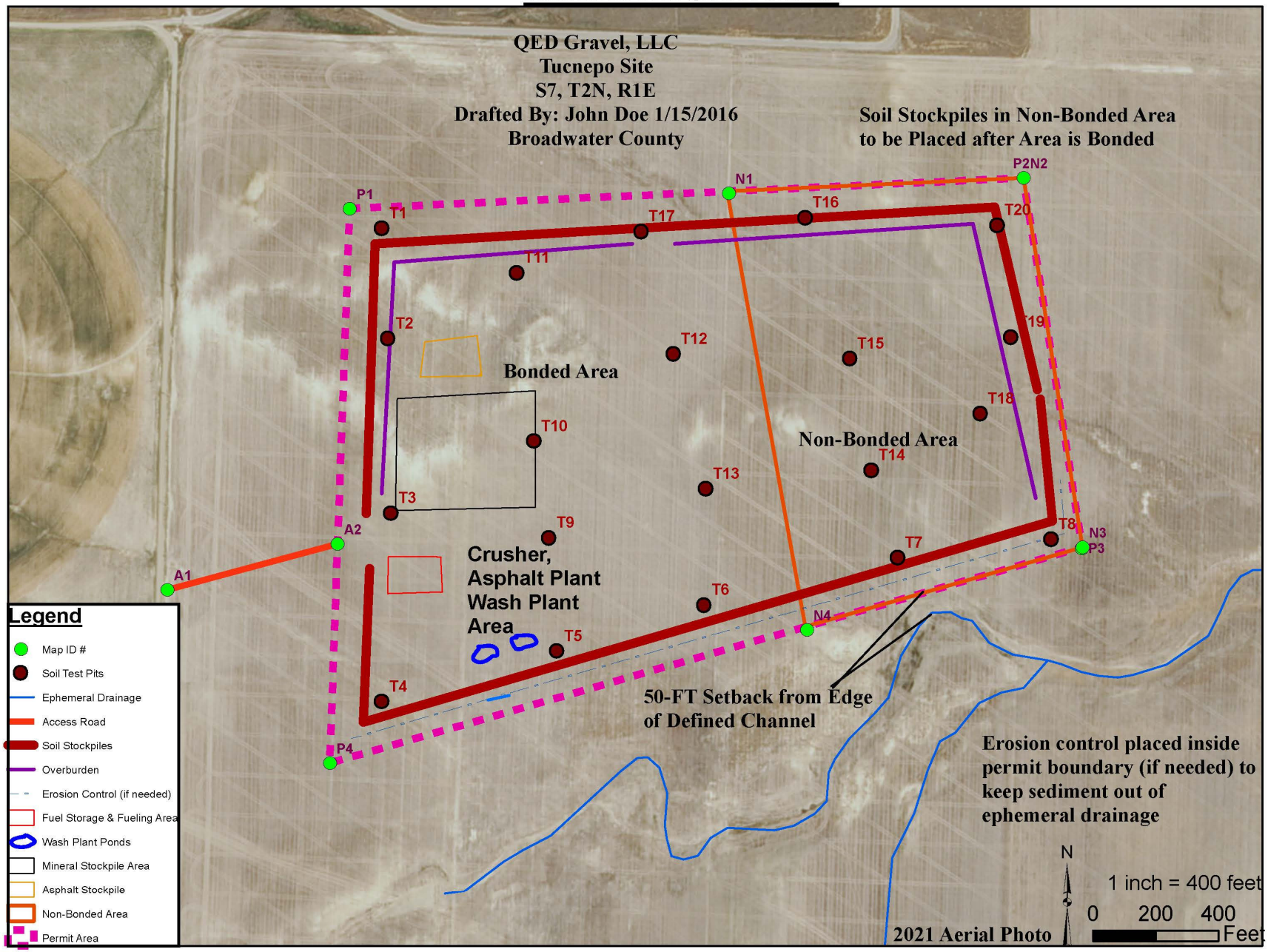
LOCATION MAP (Required for *Standard **and** Dryland Opencut Mining Permit Applications)*– The intent of this map is to meet MCA 82-4-432, which requires the operator to provide a map showing the location of the proposed operation sufficient to allow the public to locate the proposed site. The Location Map may be displayed on an aerial or topographic background and must show the site's location in relation to the nearest town or city. Roads must be labeled from the nearest town to the site on the Location Map. Use of shading is acceptable if directions to the site from the nearest town are still clear.

LEGENDS – Legends are a useful tool used to explain what the symbols and line types denoted on a map represent. If a legend is used, the Operator must display the symbol or line type that denotes a feature or features on the map with text explaining what the symbol or line type is. Text cannot be used in lieu of displaying the symbol in the legend (e.g. "black line = stockpile" & "green dot = soil test pit"; are not acceptable). Refer to the below example for a proper way to utilize a legend:

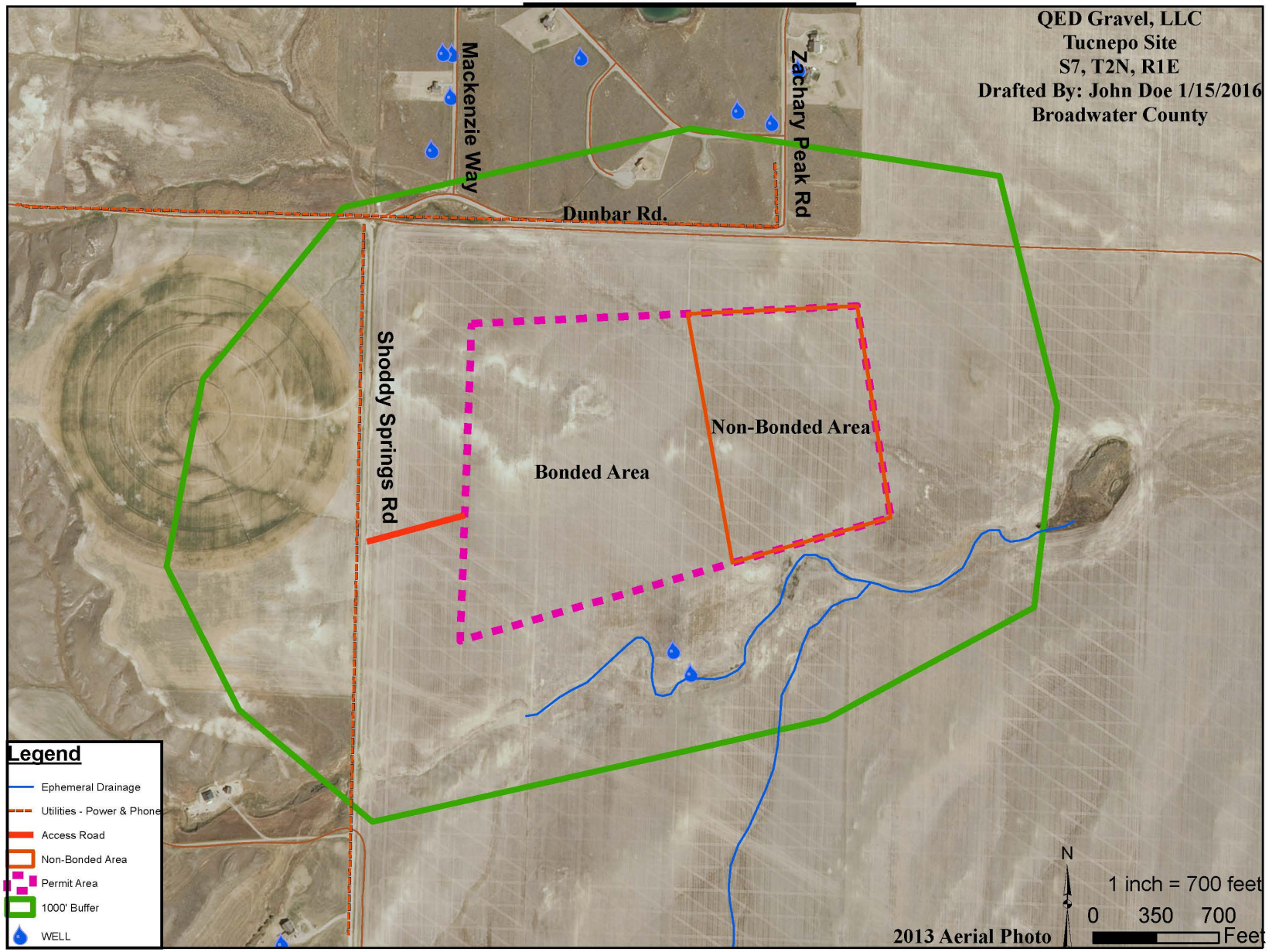

Legend
Soil Test Pit
Highwall
Utilities
Stockpile
Pond
Map ID#
Permitted Access Road
Setback
Proposed Permit
Permit
Proposed Non-Bonded
Non-Bonded

DEQ OPENCUT MINING SECTION • PO BOX 200901 • HELENA MT 59620-0901 • PHONE: 406-444-4970 • Email: DEQOpencut@mt.gov

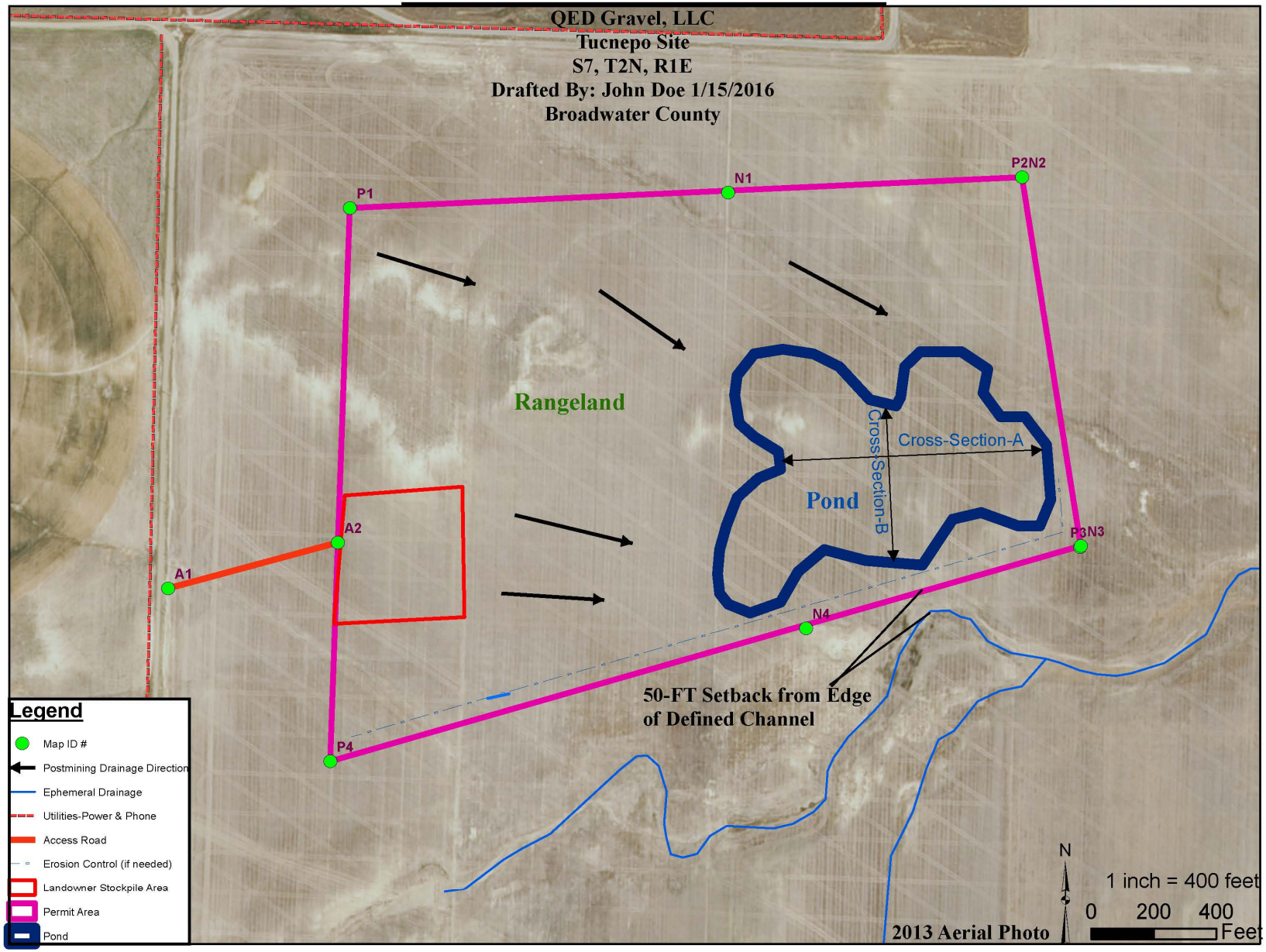
EXAMPLE SITE MAP



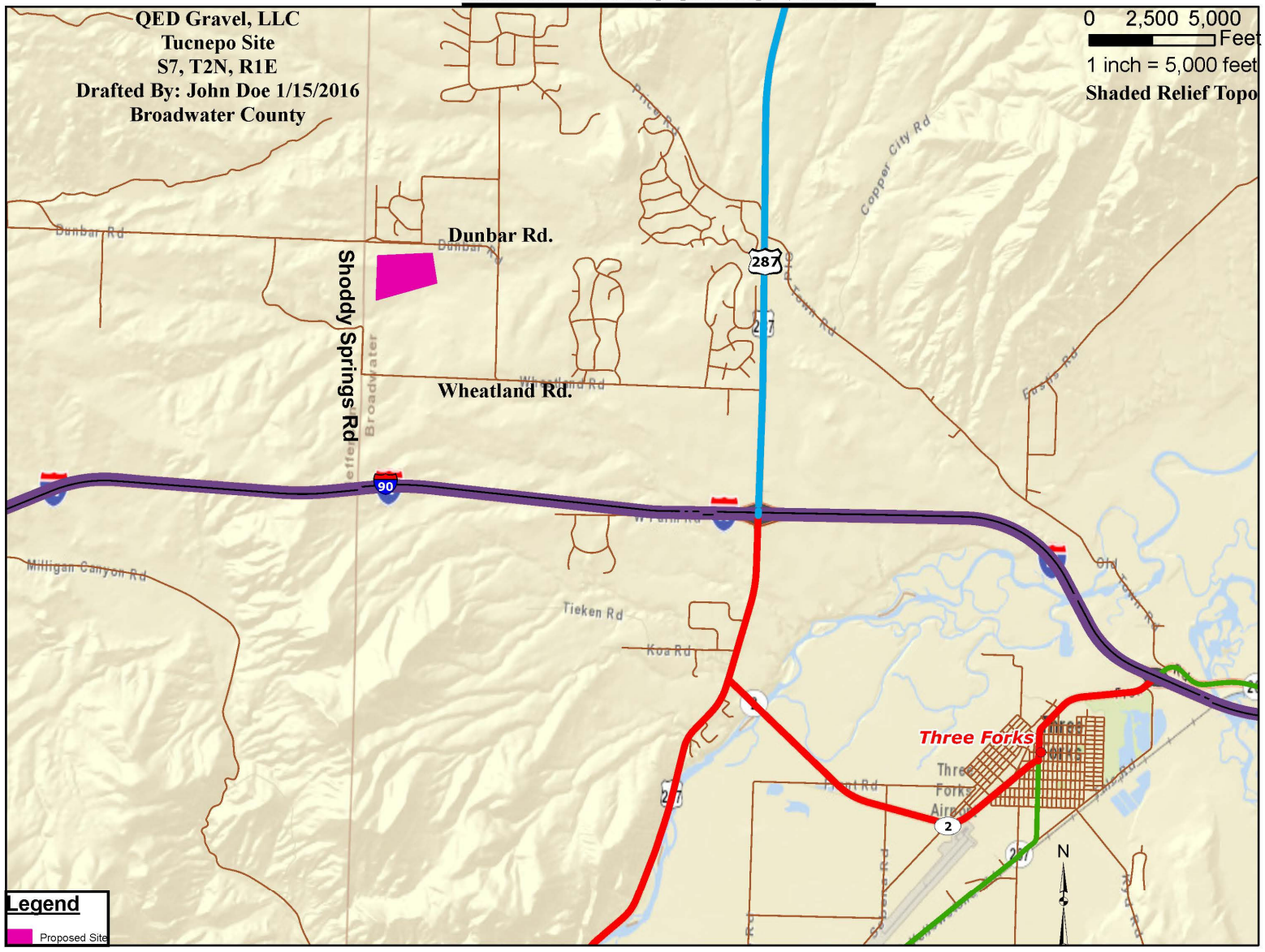
EXAMPLE AREA MAP



EXAMPLE RECLAMATION MAP



EXAMPLE LOCATION MAP



Shading is appropriately used on this map to emphasize the site location

Example 5 – Boundary Coordinate Table

OPERATOR PROPOSED PERMIT BOUNDARY COORDINATES TABLE

Purpose of this Boundary Coordinate Table: **Permit Application**

1) Use this form to submit coordinates to delineate the **Operator Proposed Permit Boundary**.

2) One Operator Proposed Permit Boundary Coordinate Table form cannot be submitted to depict multiple Permit Boundaries. If delineating multiple Permit Boundaries, use separate Operator Proposed Permit Boundary tables to identify each separate Permit Boundary.

3) When providing coordinates for an **Amended** Permit boundary, you must include coordinates that delineate the ***entire*** new Operator Proposed Permit Boundary (i.e. one proposed boundary that encompasses both the existing permitted boundary and proposed amendment area).

4) If **Bonded** and **Non-Bonded** area is present, complete the **Operator Proposed Non-Bonded Boundary Coordinate** table **in addition** to the **Operator Proposed Permit Boundary Coordinates** table (i.e. this form).

5) All boundaries are created automatically by a computer program therefore, all coordinates **must** be in geographic sequence, so that the Operator Proposed Permit Boundary is created by connecting Map ID #P1 to Map ID #P2 to Map ID #P3, etc. The last Map ID # in the BCT would connect to the first Map ID# to complete the boundary. The Map ID# for each coordinate (e.g. P1, P2, P3 etc.) must be shown on the site map. Coordinates must be submitted in **Decimal Degrees** and **WGS 84** datum and include a negative longitude to plot in Montana.

6) Provide only those coordinates needed to delineate the proposed boundary. **Do Not** provide coordinates for any other features (e.g. screen, test holes, asphalt plant, etc.), and **Do Not** leave blank rows in between coordinates in the BCT. Providing coordinates for additional features or leaving spaces will result in a boundary that cannot be drawn and the BCT will be deemed incomplete and/or deficient.

7) Only put numerical coordinates in the Latitude or Longitude boxes (i.e. no "N" or "W"), or this BCT will not be accepted. Coordinates must be in decimal degree format and provided to the fifth decimal point.
Example: Latitude 46.58946 & Longitude -112.00480.

8) Email the completed Microsoft Excel table to: DEQopencut@mt.gov with "Subject" line: **BCT (Operator-Site Name)**. Do **not** include a printed version of this table with the paper application submitted to the Program's Helena office.

Operator Name: Qed Gravel, LLC

Site Name: Tucnepo

Permit # (if not a new app) 9999 **Date:** 1/15/2016

MAP ID#	LATITUDE	LONGITUDE	DESCRIPTION (not required)
P1	45.94554	-111.65813	
P2	45.94596	-111.64966	
P3	45.94274	-111.64883	
P4	45.94068	-111.65817	
P5		-	
P6			
P7		-	
P8		-	
P9		-	
P10		-	
P11		-	
P12		-	
P13		-	
P14		-	
P15		-	
P16		-	
P17		-	
P18		-	
P19		-	
P20		-	

OPERATOR PROPOSED ACCESS ROAD COORDINATES TABLE

1) Use this form to submit coordinates to delineate an **Access Road.** An access road would only be permitted if the Landowner requested the access road to be permited on the Landowner Consultation form.

2) One Operator Proposed Access Road Coordinate Table form cannot be submitted to depict multiple roads. If delineating multiple Access Roads, use separate Operator Proposed Access Road tables to identify each separate access road.

3) When providing coordinates for an **Access Road**, you must include coordinates that delineate the centerline of the Access Road. The Operator Proposed Access Road Boundary Coordinate Table would be used to delineate the road from the nearest public access to its connection to the permit boundary.

4) Do NOT use this form to delineate internal roads. This form is for Operator Proposed Permitted Access Roads only.

5) All roads are created automatically by a computer program therefore, all coordinates **must** be in geographic sequence, so that the Operator Proposed Access Road boundary is created by connecting Map ID #A1 to Map ID #A2 to Map ID #A3, etc. The Map ID# for each coordinate (e.g. A1, A2, A3 etc.) must be shown on the site map. Coordinates must be submitted in Decimal Degrees and WGS 84 datum and include a negative longitude to plot in Montana.

6) Provide only those coordinates needed to delineate the proposed boundary. **Do Not** provide coordinates for any other features (e.g. internal road, etc.), and **Do Not** leave blank rows in between coordinates in the BCT. Providing coordinates for additional features or leaving spaces will result in a boundary that cannot be drawn and the BCT will be deemed incomplete and/or deficient.

7) Only put numerical coordinates in the Latitude or Longitude boxes (i.e. no "N" or "W"), or this BCT will not be accepted. Coordinates must be in decimal degree format and provided to the fifth decimal point.
Example: Latitude 46.58946 & Longitude -112.00480.

8) Email the completed Microsoft Excel table to: DEQopencut@mt.gov with "Subject" line: **BCT (Operator-Site Name)**. Do **not** include a printed version of this table with the paper application submitted to the Program's Helena office.

Operator Name:	QED Gravel, LLC		
Site Name:	Tucnepo		
Permit # (if not a new app)	9999	**Date:**	1/15/2016

MAP ID#	LATITUDE	LONGITUDE	DESCRIPTION (not required)
A1	45.94217	-111.66027	
A2	45.94257	-111.65815	
A3		-	
A4		-	
A5		-	
A6		-	
A7		-	
A8		-	
A9		-	
A10		-	
A11		-	
A12		-	
A13		-	
A14		-	
A15		-	
A16		-	
A17		-	
A18		-	
A19		-	
A20		-	

OPERATOR PROPOSED NON-BONDED BOUNDARY COORDINATE TABLE

Private Operators bonding the entire site would **not** use this table.
Counties and other Government agencies not required to post a bond would **not** use this table.
Use the **Operator Proposed Permit Boundary Coordinate** table to depict the operator proposed permit boundary.

1) Use this form to submit coordinates to delineate the Operator Proposed Non-Bonded boundary only. By default, the remaining area would be the Bonded area.

2) One Operator Proposed Non-Bonded Boundary Coordinate Table form cannot be submitted to depict multiple Non-Bonded boundaries. If delineating multiple Non-Bonded boundaries, use separate Operator Proposed Non-Bonded Boundary Coordinate Tables to identify each separate Non-Bonded boundary.

3) This table must be submitted in conjunction with the Operator Proposed Permit Boundary Coordinate Table, which delineates the entire proposed permit boundary, except when the existing permit boundary is not changing. If the permit boundary is already defined by coordinates and isn't changing, do not resubmit an Operator Proposed Permit Boundary Coordinates Table.

4) All boundaries are created automatically by a computer program therefore, all coordinates **must** be in geographic sequence, so that the Operator Proposed Permit Boundary is created by connecting Map ID #N1 to Map ID #N2 to Map ID #N3, etc. The last Map ID # in the BCT would connect to the first Map ID# to complete the boundary. The Map ID# for each coordinate (e.g. N1, N2, N3 etc.) must be shown on the site map. Coordinates must be submitted in **Decimal Degrees** and **WGS 84** datum and include a negative longitude to plot in Montana.

5) Provide only those coordinates needed to delineate the proposed boundary. **Do Not** provide coordinates for any other features (e.g. screen, test holes, asphalt plant, etc.), and **Do Not** leave blank rows in between coordinates in the BCT. Providing coordinates for additional features or leaving spaces will result in a boundary that cannot be drawn and the BCT will be deemed incomplete and/or deficient.

6) Only put numerical coordinates in the Latitude or Longitude boxes (i.e. no "N" or "W"), or this BCT will not be accepted. Coordinates must be in decimal degree format and provided to the fifth decimal point.
Example: Latitude 46.58946 & Longitude -112.00480.

7) Email the completed Microsoft Excel table to: DEQopencut@mt.gov with "Subject" line: **BCT (Operator-Site Name)**. Do **not** include a printed version of this table with the paper application submitted to the Program's Helena office.

Operator Name:	Qed Gravel, LLC
Site Name:	Tucnepo
Permit # (if not a new app)	9999
Date:	1/15/2016

MAP ID#	LATITUDE	LONGITUDE	DESCRIPTION (not required)
N1	45.94578	-111.65339	
N2	45.94596	-111.64966	
N3	45.94274	-111.64883	
N4	45.94199	-111.65226	
N5		-	
N6			
N7		-	
N8		-	
N9		-	
N10		-	
N11		-	
N12		-	
N13		-	
N14		-	
N15		-	
N16		-	
N17		-	
N18		-	