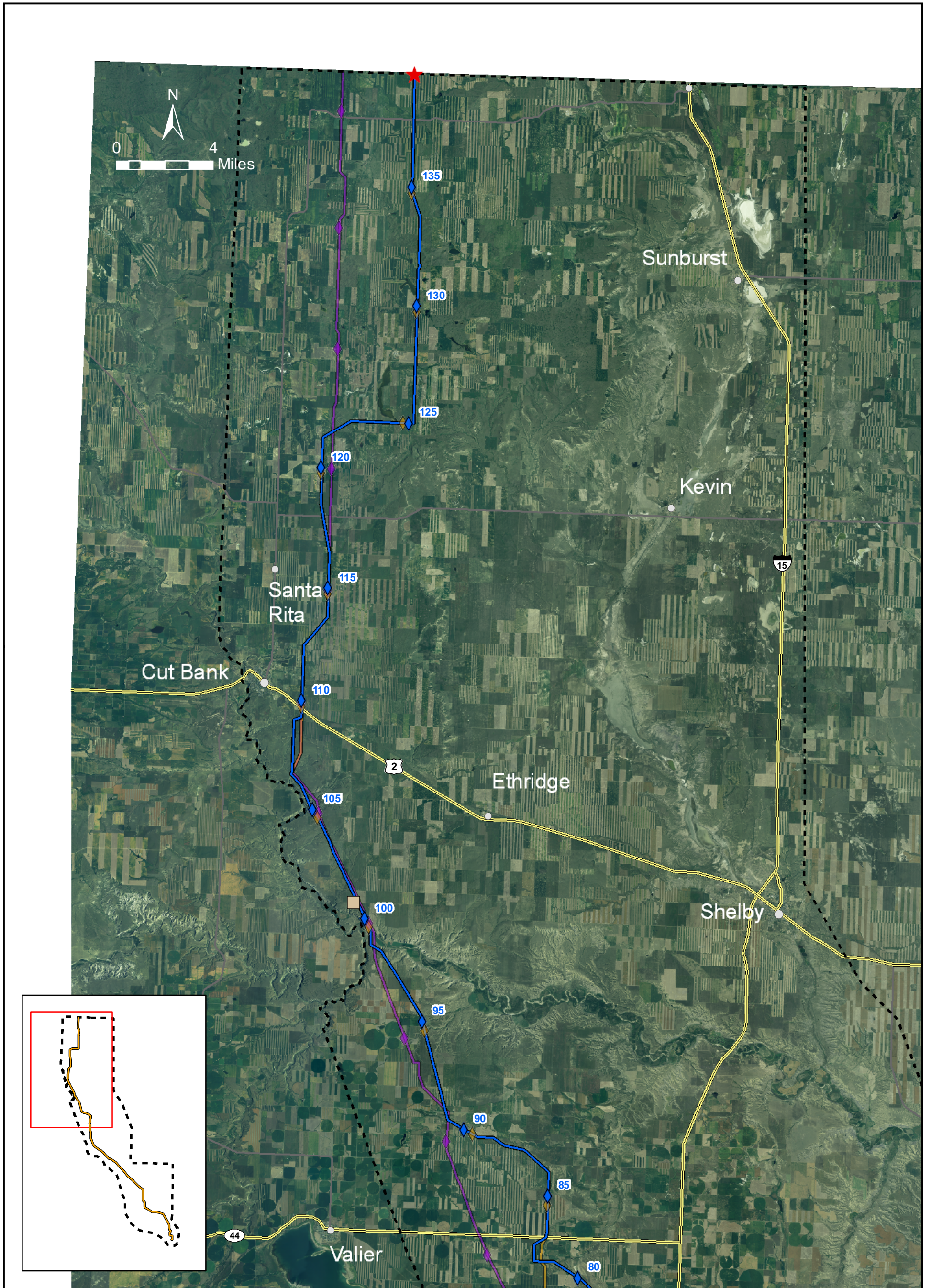


**FIGURE 2.5-3
ALTERNATIVE 4 ALIGNMENT
MIDDLE**

- | | | | | |
|---------------|--|---|--------------|---------------------|
| LEGEND | | ALT 4 - ALIGNMENT
ALT 4 MILE MARKERS | | STUDY AREA BOUNDARY |
| | | ALT 2 - ALIGNMENT
ALT 2 MILE MARKERS | | MAJOR HIGHWAYS |
| | | ALT 3 - ALIGNMENT
ALT 3 MILE MARKERS | | SECONDARY ROADS |
| | | CITIES AND TOWNS | | |
| | | ALIGNMENT END AND EXIT POINTS | | |
| | | | NOTE: | ALT = ALTERNATIVE |
| | | | | |



**FIGURE 2.5-4
ALTERNATIVE 4 ALIGNMENT
NORTH**

- | | | | | |
|---------------|--|-------------------------------|--------------|---------------------|
| LEGEND | | ALT 4 - ALIGNMENT | | STUDY AREA BOUNDARY |
| | | ALT 4 MILE MARKERS | | MAJOR HIGHWAYS |
| | | ALT 2 - ALIGNMENT | | SECONDARY ROADS |
| | | ALT 2 MILE MARKERS | | MARIAS SUBSTATION |
| | | ALT 3 - ALIGNMENT | | |
| | | ALT 3 MILE MARKERS | | |
| | | CITIES AND TOWNS | | |
| | | ALIGNMENT END AND EXIT POINTS | | |
| | | | NOTE: | ALT = ALTERNATIVE |
| | | | | |

After paralleling Alternative 2 for about 2 miles, the Alternative 4 alignment would diverge from the Alternative 2 alignment approximately 8 miles southeast of Brady. After running directly west for approximately 3 miles, Alternative 4 would turn northwest for approximately 1½ miles, then turn directly north for approximately 18 miles, then turn directly west, heading for the Dry Fork of the Marias River. After the alignment crosses the existing WAPA 230-kV transmission line, approximately 2 miles south of Ledger, it would intersect the Dry Fork of the Marias River. The alignment would generally parallel the Dry Fork of the Marias River until it crossed Interstate 15, then head northwest along Big Flat Coulee for approximately 8 miles.

The alignment would turn west for approximately 1 mile before crossing Alternative 2, approximately 4 miles north of the Dry Fork of the Marias River crossing. The portion of the alignment along Dry Fork of the Marias and Big Flat Coulee would minimize diagonal crossing of crop land, avoid crossing crop land by traversing uncultivated land, and avoid residences and paralleling of pipelines.

After crossing Alternative 2 near milepost 81, the Alternative 4 alignment would run slightly west of the Alternative 2 alignment for about 1 mile, just north of Belgian Hill, and would be located farther away from residences. The Alternative 4 alignment in this area would reduce visual impacts, although some diagonal crossing of farmland would be required. The alignment then rejoins the Alternative 2 alignment around milepost 83.

Just south of Highway 2 near milepost 107, the Alternative 4 alignment would be located approximately ¼ mile west of Alternative 2 for a 2-mile stretch. This location would better follow property boundaries and be located farther away from residences. The Alternative 4 alignment would rejoin the Alternative 2 alignment near milepost 109 and would follow the Alternative 2 alignment north for approximately 30 miles to the border crossing.

Design Features of Alternative 4

In order to minimize impacts, the transmission line would use monopole construction design in areas used for croplands and CRP. Monopole construction design is shown in **Figure 2.3-5**. The design characteristics are summarized in **Tables 2.3-1 and 2.3-2**. The Alternative 4 alignment would cross 88.9 miles of cropland and CRP.

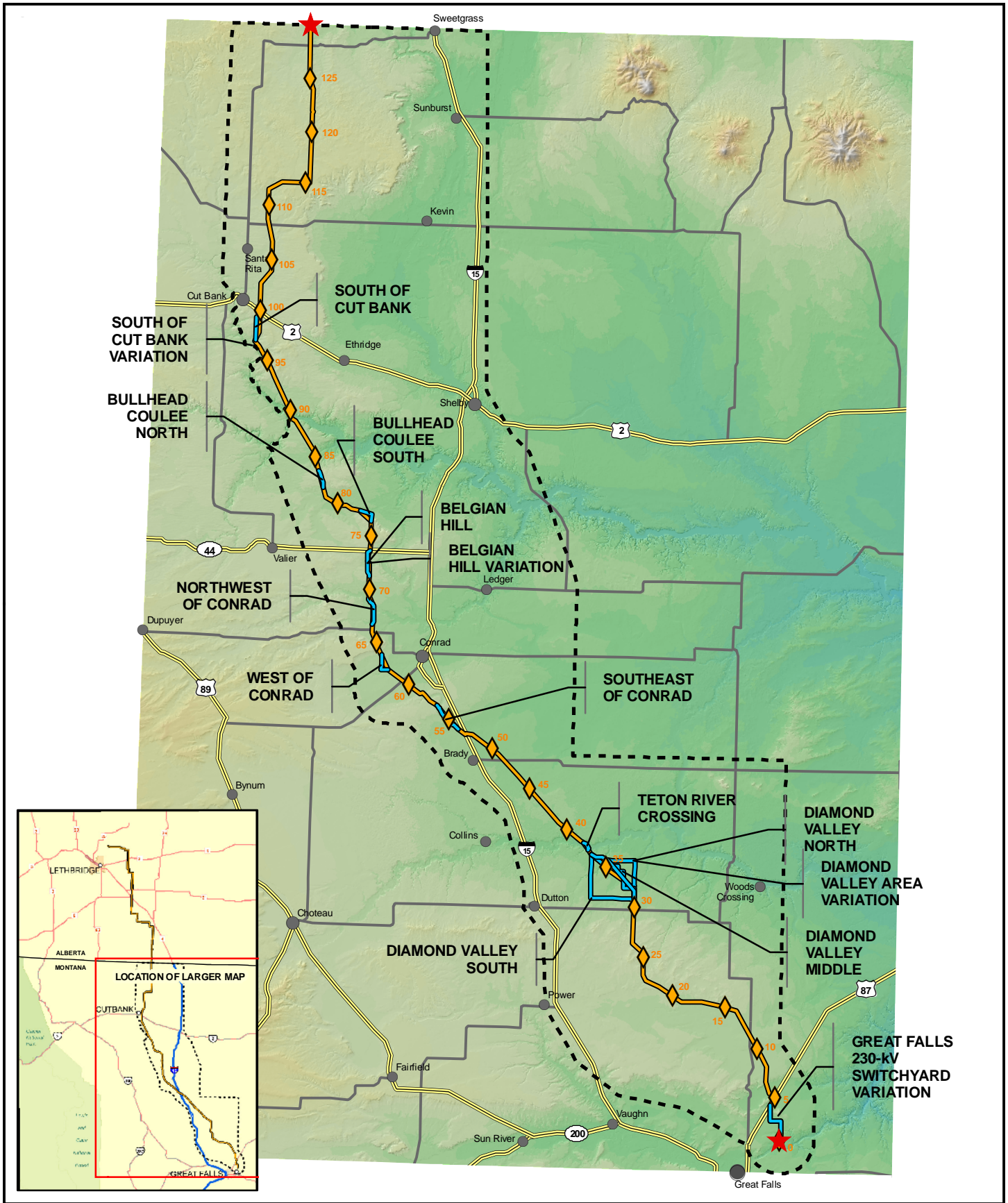
| [The revised draft](#) DEQ Environmental Specifications (**Appendix F**) identify general environmental protection measures and sensitive areas for site-specific specifications; DOE or BLM may also require some additional environmental protection measures. Bird markers would also be used where recommended within ¼ mile of wetlands. To implement this measure, FWP and FWS biologists would be invited to field verify sites identified for markings. To decrease the line's contrast and visibility, non-shiny

conductors would be used. Steel monopoles would be self-weathering to decrease contrast. In order to make the transmission line more visible to low flying aircraft navigating by the roads, ball markers would be used where the line crosses Interstate 15 and U.S. Highways 87 and 2. Marker balls would also be placed at all river crossings.

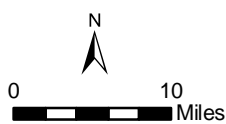
2.6 Development of Local Routing Options for Alternatives 2 and 4

Based on public comments received on the March 2007 document [and the Draft EIS](#), the agencies worked with landowners to refine Alternatives 2 and 4 to address landowner concerns related to costs, impacts to farming, impacts to other land uses, and impacts to visuals resources. They developed 11 [Local Routing Options](#) for Alternative 2, a subset of which could also be applied to Alternative 4. [Since the publication of the Draft EIS, the agencies have identified four minor variations to the Local Routing Options and one variation to a segment of Alternative 2. These variations are intended to help mitigate and minimize impacts to existing and future land uses in this area. These variations are described in Sections 2.6.1 \(Diamond Valley Area\), 2.6.5 \(Northwest of Conrad\), 2.6.6 \(Belgian Hill Area\), 2.6.8 \(South of Cut Bank\), and 2.6.9 \(Great Falls 230-kV Switchyard Area\).](#) **Figure 2.6-1** provides the general locations for the [Local Routing Options and Variations](#).

The public comments, meetings with landowners, and cost information were used to further refine and compare the [Local Routing Options](#) based on the costs to landowners to farm around structures on diagonal field crossings, costs to landowners to farm around structures on field edges, and the cost to MATL of additional line construction (Section 3.16). Other land use issues were considered, including one landowner's concern over the potential loss of income if the line is too close to allow the construction of a wind turbine on his land. The agencies also considered the potential for visual and human health impacts associated with the [Local Routing Options](#) and their proximity to residences. Potential impacts for other resources were considered but are not discussed in detail since the potential effects would differ little between the Alternative 2 alignment and the [Local Routing Options](#). The sections below describe the [Local Routing Options](#) in more detail and give the primary reasons for their development.



**FIGURE 2.6-1
LOCAL ROUTING OPTIONS
AND VARIATIONS**



- LEGEND**
- ALT 2 - PROPOSED ALIGNMENT
 - MILE MARKERS
 - LOCAL ROUTING OPTIONS
 - MAJOR HIGHWAYS
 - SECONDARY ROADS
 - STUDY AREA BOUNDARY
 - CITIES AND TOWNS
 - ALIGNMENT END AND EXIT POINTS

2.6.1 Diamond Valley Area

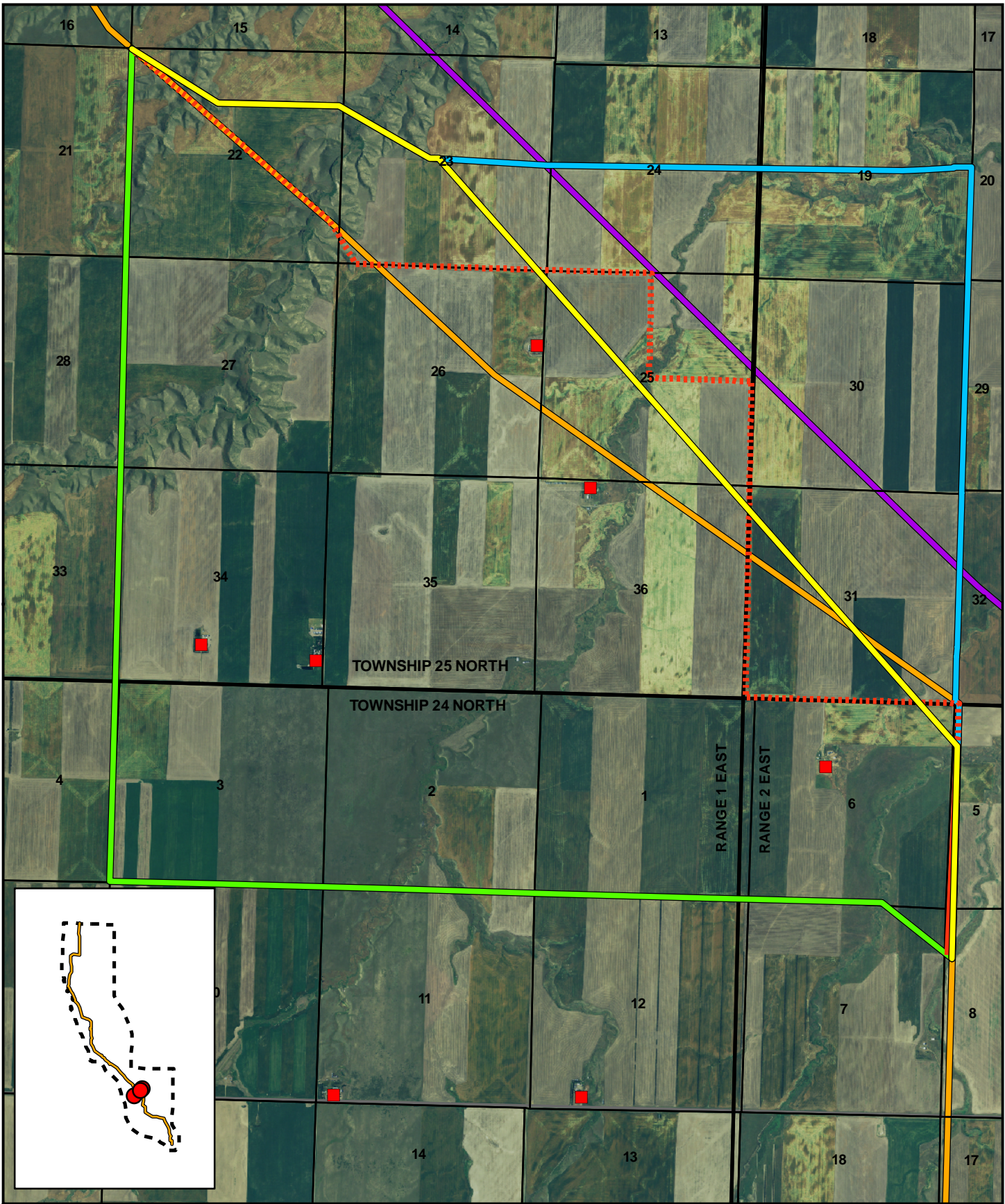
Landowner concerns with Alternative 2 in the Diamond Valley area east of Dutton focused on the amount of farmland crossed on the diagonal by Alternative 2 and the close proximity of residences. The Alternative 4 location in the Diamond Valley area was developed to avoid proximity to residences and reduce diagonal crossing of farmland. However, Alternative 4 would still diagonally cross about 3.5 miles of farmland where it would parallel NWE's existing 115-kV line and could create even more obstacles for farm equipment. The Alternative 4 portion through the Diamond Valley did not meet with local acceptance and is no longer being carried forward as a mitigating measure for Alternative 2 in this area. Three [Local Routing Options](#) were identified for the Diamond Valley area (**Figure 2.6-2**). In addition to the Diamond Valley South and Diamond Valley North options that were suggested by the local landowners, MATL identified the Diamond Valley Middle option.

The Diamond Valley South routing, although longer than other options, would be located almost entirely along section lines to minimize diagonal crossing of cultivated fields. It also would avoid residences by at least $\frac{1}{4}$ mile. In Section 7, T24N, R2E where this routing does cross a field diagonally, it is situated such that the guyed angle structures would be in range and pasture lands. This option would be approximately 1.7 miles longer than Alternative 2 and more costly to construct.

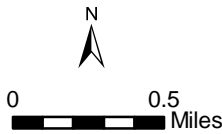
The Diamond Valley North option is similar to the Diamond Valley South option in that it would be located primarily on section and half section lines and would avoid diagonal crossing of most cultivated land. It also would avoid close proximity to residences.

This routing would cross the existing NWE 115-kV line twice, potentially creating areas in fields not sprayable by cropdusters where the two lines are in close proximity and create an acute angle. This routing would be located near a single grain bin that might have to be moved if too close to the transmission line. It would be approximately 1.6 miles longer than Alternative 2 and more costly to construct.

The Diamond Valley Middle option is being considered as an applicant-initiated option. It would be approximately 1.3 miles longer and more costly to construct compared to Alternative 2. This option would be located within $\frac{1}{2}$ mile of three residences. The Diamond Valley Middle option would create several angular approaches to the existing NWE 115-kV line (primarily Section 25 T25N, R1E) resulting in some potentially unsprayable fields if cropdusters were used.



**FIGURE 2.6-2
LOCAL ROUTING OPTION AND VARIATION
DIAMOND VALLEY AREA**



- LEGEND**
- ALT 2 - PROPOSED ALIGNMENT
 - ALT 3 - ALIGNMENT
 - DIAMOND VALLEY SOUTH
 - - - DIAMOND VALLEY MIDDLE
 - DIAMOND VALLEY NORTH
 - DIAMOND VALLEY LOCAL VARIATION
 - MAJOR HIGHWAYS
 - SECONDARY ROADS
 - SECTION LINE
 - STUDY AREA BOUNDARY
 - HOUSES WITHIN 1 MILE OF ANY ALTERNATIVE

In comments on the Draft EIS, landowners suggested a variation on Local Routing Options in the Diamond Valley area as indicated on **Figure 2.6-2**. It would better avoid one residence but would be slightly longer than Alternative 2. It would still involve crossing cultivated land with monopole structures. Compared to Alternative 2, it would cross an additional 1.3 miles of farmland (5.1 miles for Diamond Valley minor routing variation versus 3.8 miles for Alternative 2). MATL has indicated it would attempt to locate structures on field boundaries regardless of the selected route, but limitations in span length and possibly line tension would result in some structures being placed in mid-field locations.

2.6.2 Teton River Crossing Area

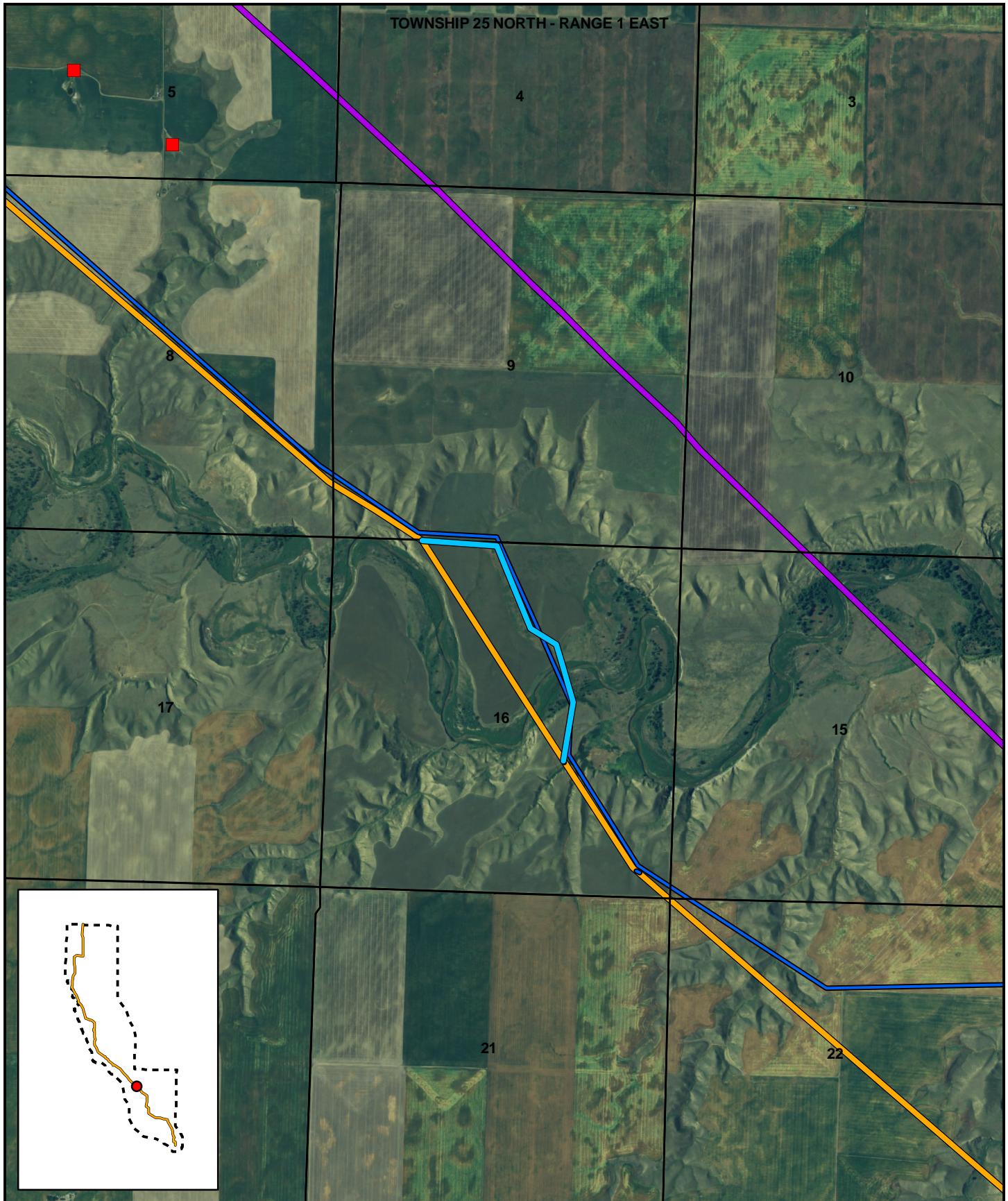
The Teton River Crossing Local Routing Option (**Figure 2.6-3**) was developed based on a landowner's concern that a structure would be located on a low terrace that is reported to have flooded in 1964 and DNRC's recommendation that the line be located at the edge of fields. The general alignment of this option is similar to Alternative 4 through this specific area. The Teton River has a meandering channel through a much broader river floodplain. The rerouting of Alternative 2 through this location would put the structure on a slightly higher elevation. The proximity to residences would be the same for this option as Alternative 2 with no occupied residences nearby. Because the Teton River Crossing routing would require more angled structures, it would be more costly to construct compared to Alternative 2.

2.6.3 Southeast of Conrad

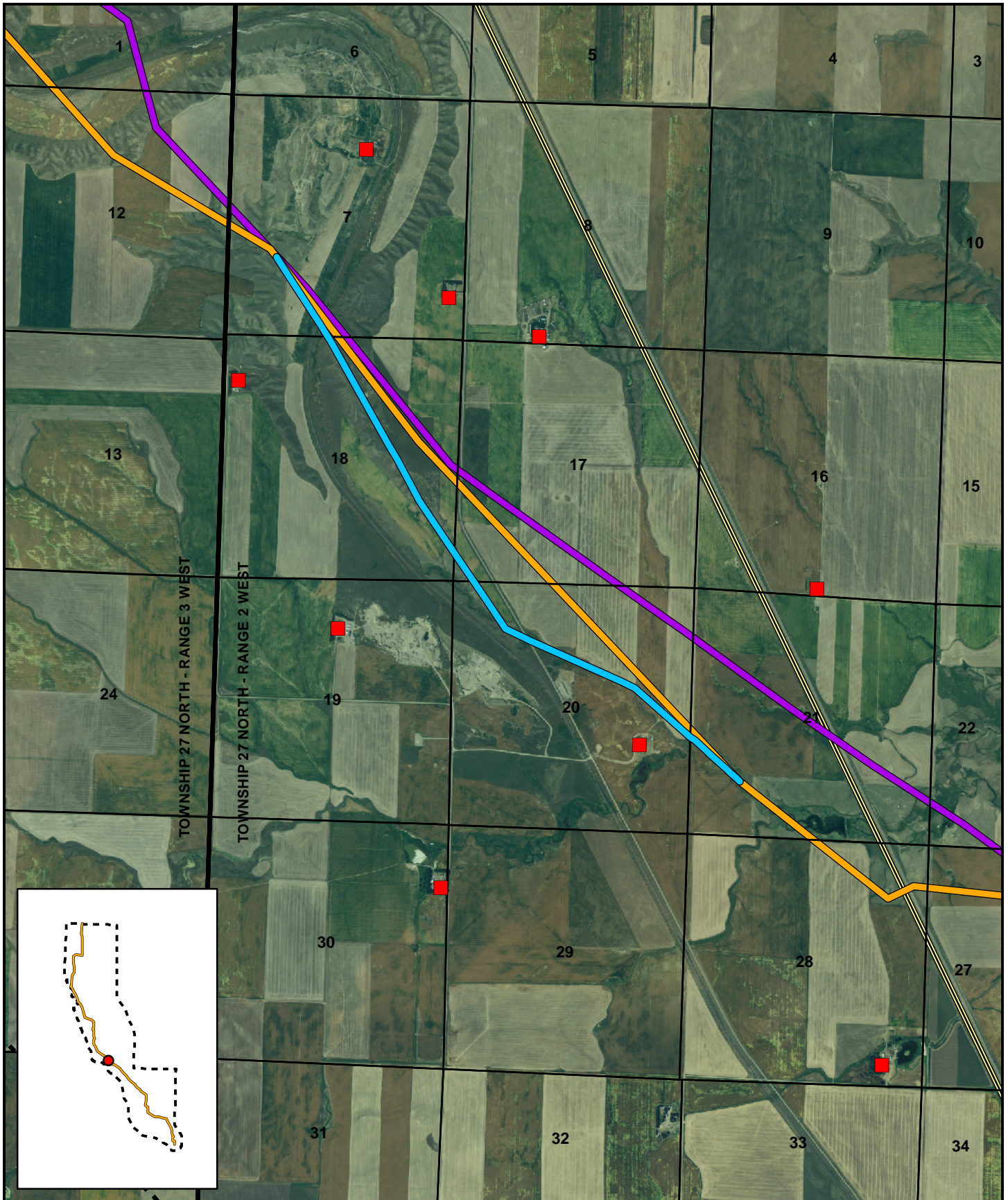
The Southeast of Conrad Local Routing Option (**Figure 2.6-4**) was proposed to decrease diagonal crossing of cultivated farmland. Most of this routing would be on range and pasture land. This option would result in less farming impacts than Alternative 2. The construction costs would be slightly greater than the costs for Alternative 2.

2.6.4 West of Conrad

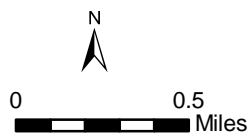
The suggested Local Routing Option west of Conrad would reduce the amount of cultivated land crossed diagonally (**Figure 2.6-5**). This option would decrease potential mid-field interference with aerial crop dusting compared to Alternative 2, but would increase edge-of-field and some mid-field interference along the southern east-west segment. The landowner suggested that monopoles be used along field edges of this Local Routing Option. When presented with a choice between H-frame structures at the edge of the field and monopoles crossing the fields diagonally, the landowner indicated that the monopole option would be preferable (Jones 2008). This routing would result in reduced farming costs to farmers due to structure locations along the edges of fields.



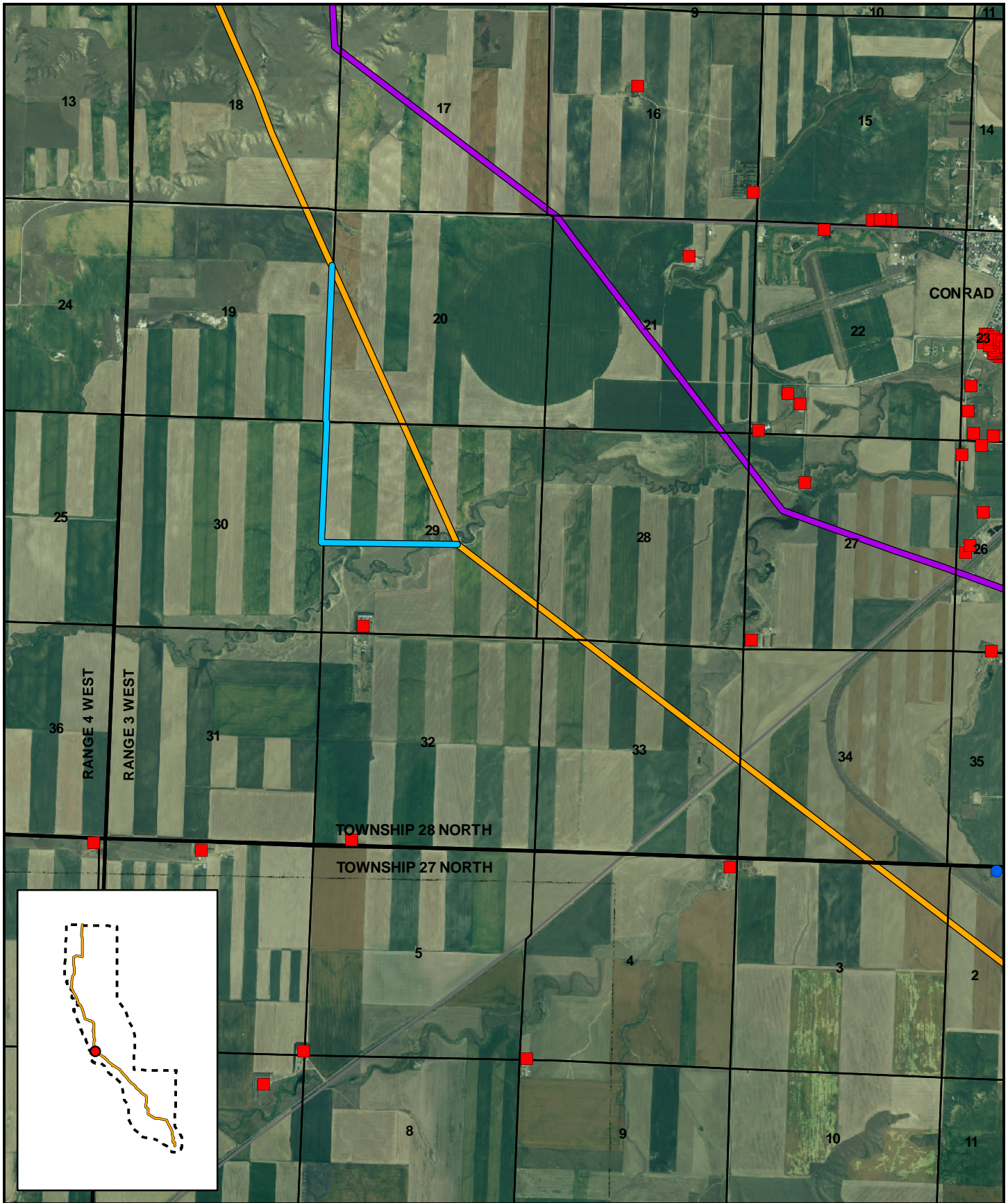
**FIGURE 2.6-3
LOCAL ROUTING OPTION AT
TETON RIVER CROSSING**



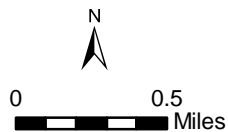
**FIGURE 2.6-4
LOCAL ROUTING OPTIONS
SOUTHEAST OF CONRAD**



- LEGEND**
- ALTERNATIVE 2 - ALIGNMENT
 - ALTERNATIVE 3 - ALIGNMENT
 - SOUTHEAST OF CONRAD
 - MAJOR HIGHWAYS
 - SECONDARY ROADS
 - SECTION LINE
 - STUDY AREA BOUNDARY
 - HOUSE
 - GRAIN SILOS



**FIGURE 2.6-5
LOCAL ROUTING OPTION
WEST OF CONRAD**



LEGEND

- ALT 2 - PROPOSED ALIGNMENT
- ALT 3 - ALIGNMENT
- WEST OF CONRAD
- MAJOR HIGHWAYS
- SECONDARY ROADS
- SECTION LINE
- STUDY AREA BOUNDARY
- HOUSE
- GRAIN SILOS

However, it would still have some structures in mid-field locations. Cost of construction would be greater than Alternative 2. MATL has indicated a willingness to implement this small, [Local Routing Option](#).

2.6.5 Northwest of Conrad

Northwest of Conrad a [Local Routing Option](#) would reduce diagonal crossing of farmland, increase placement of structures along field boundaries on both private and state land, [and increase the use of private range and pasture land instead of cropland \(Figure 2.6-6\)](#). The [Local Routing Option](#) would decrease the amount of cultivated land crossed, thereby decreasing costs to farm around structures. The line length would increase [by 0.1 mile](#).

2.6.6 Belgian Hill Area

The Belgian Hill Area [Local Routing Option as presented in the Draft EIS \(Figure 2.6-7\)](#) would [have increased](#) the distance from four residences in this area compared to Alternative 2. Alternative 4 through this area [would use the north half of this Local Routing Option](#).

[In comments on the Draft EIS, the agencies learned of plans to develop a center-pivot irrigation system in the vicinity of the Belgian Hill Local Routing Option described in the Draft EIS. As a result, the Local Routing Option has been revised \(Figure 2.6-7\). The Local Routing Option would remain about 0.5 mile from houses along Belgian Hill Road. However, it would increase the amount of cropland crossed by approximately 0.64 mile and add 0.50 mile of total line length compared to Alternative 2.](#)

2.6.7 Bullhead Coulee Area

Two [Local Routing Options](#) were suggested by landowners in the Bullhead Coulee area [\(Figure 2.6-8\)](#). One, the Bullhead Coulee South, approximately 4 to 7 miles north of the Valier Highway (State Highway 44), would avoid diagonal crossing of cropland and place the transmission line within a proposed wind farm. The landowner indicated turbines cannot be placed within 500 feet of the line. In Alternative 2 as proposed, a landowner could lose the opportunity of receiving annual payments from having a turbine located on his land. This routing option would allow placement of a wind turbine south of the line. Expected annual revenue from the turbine over the life of the line is estimated to exceed the additional cost of line construction. The turbine is part of a wind farm that has not signed agreements with MATL but plans to interconnect with another transmission line in the area.