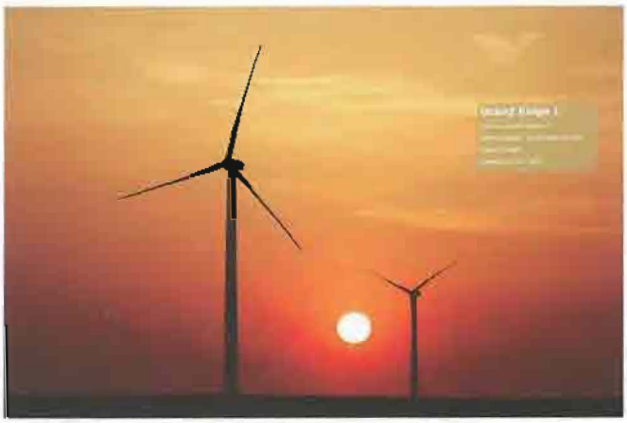
California Ridge Wind Farm

Champaign County, IL

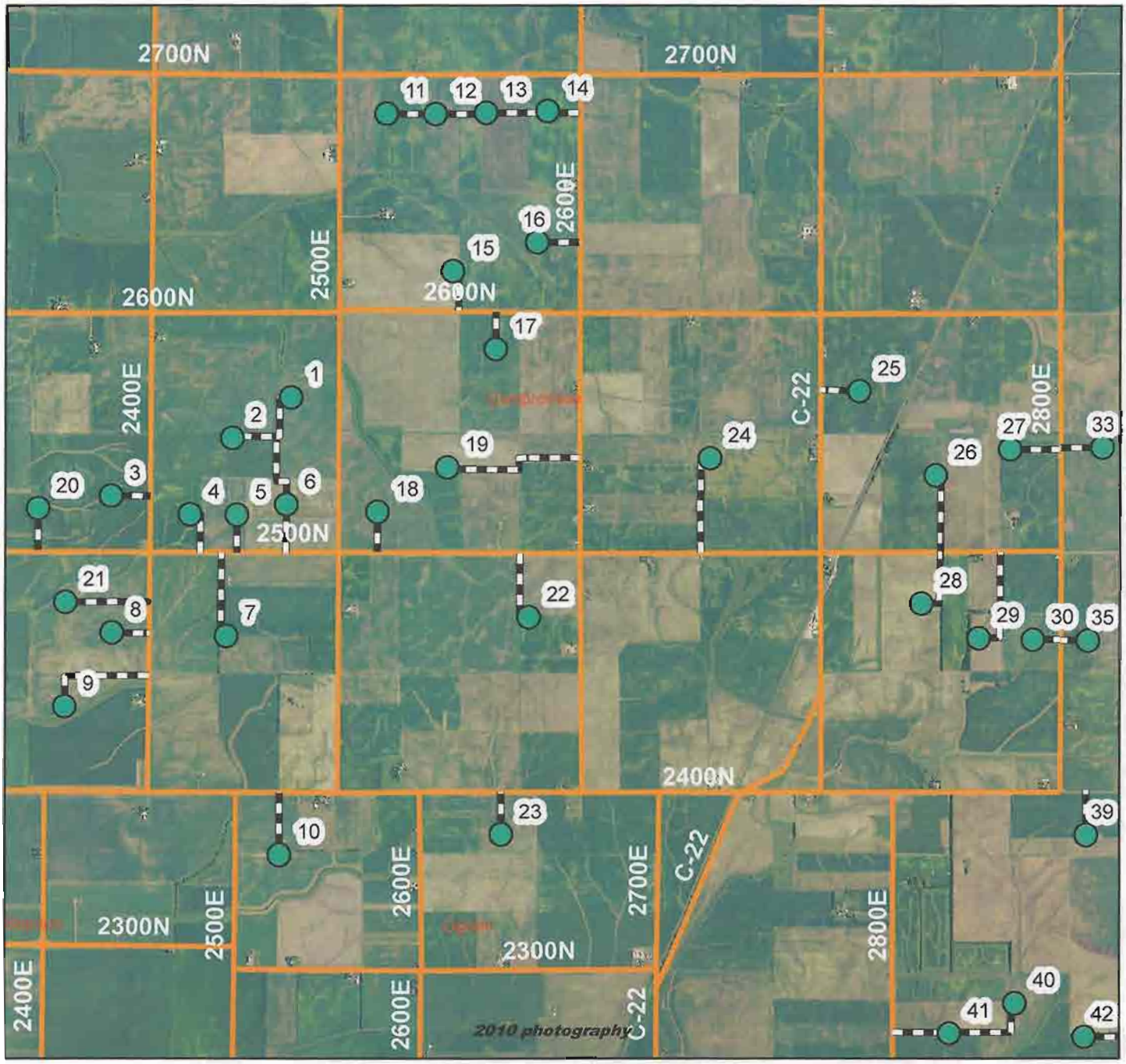


Natural Resource Report

CHAMPAIGN COUNTY
Soil & Water
CONSERVATION DISTRICT

October 6, 2011

California Ridge Wind Farm
Turbine Locations



California Ridge Wind Farm
Natural Resource Report Summary

The California Ridge Wind Farm Project in Champaign County consists of 30 turbine sites and associated access roads and connecting underground wiring in Compromise and North Ogden Townships. The project can be completed with minimal impact on our natural resources if the following issues are addressed:

1. There are concentrated flow areas where water will flow over the access roads and turbine parking areas and could erode gravel away and/or have silt deposited on them.
2. Some access roads are on steep enough slopes that gulley erosion may develop along the edges of the access roads.
3. Two access roads cross conservation practices that will need to be addressed.
4. The project will damage field tile that will need to be repaired to return it to a functioning state.

All of these issues are common to Illinois wind farms and have been brought to the attention of the developer. They can be satisfactorily addressed and engineers are examining solutions that were proposed so they can be part of the final construction plan. The specific issues that apply to each site are addressed separately in this report.

The LE score for the 18.5 acres that will be taken out of crop production for access roads and turbines is 81, which is below the 85 threshold for Best Prime Farmland in Champaign County.

The crops were not harvested when this assessment was prepared and field visits will be done after harvest to verify the concerns that were raised. A report will be completed that reflects these changes to the county and Invenergy.

The Champaign County SWCD (CCSWCD) will assist Invenergy with issues raised and any additional ones that may develop as the project progresses. The CCSWCD also assist landowners and farmers with conservation practices that can be applied to adjacent fields to reduce runoff and mitigate some of the issues raised.

Some drawings and NRCS Standards are provided for information that may be useful. A professional Engineer should make all final design decisions.

Champaign County Soil and Water Conservation District
2110 West Park Court Suite C
Champaign, IL 61822
217-352-3536 Ext. 3
Fax 217-352-4781

LAND EVALUATION WORKSHEET

Soil Type	Soil Name	Ag Group	Relative Value	Acres	Land Evaluation Score
56B	Dana Silt Loam	3	87	0.2	17
91B2	Swygert SCL	6	70	0.1	7
146B2	Elliott SCL	5	79	5.1	403
152A	Drummer SCL	2	98	0.7	69
223B2	Varna SCL	5	79	3.2	253
223C2	Varna SCL	7	65	0.5	33
223C3	Varna SCL	7	65	0.1	7
223D3	Varna SCL	7	65	0.1	7
232A	Ashkum SCL	4	85	6.6	561
481A	Raub Silt Loam	3	87	0.8	26
622C2	Wyanet Silt Loam	7	65	0.4	8
663B	Claire Silt Loam	5	79	0.1	26
					0
	SCL=Silty Clay Loam				
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0

Total LE Weighted Factor= 1415

Acreage= 17.9

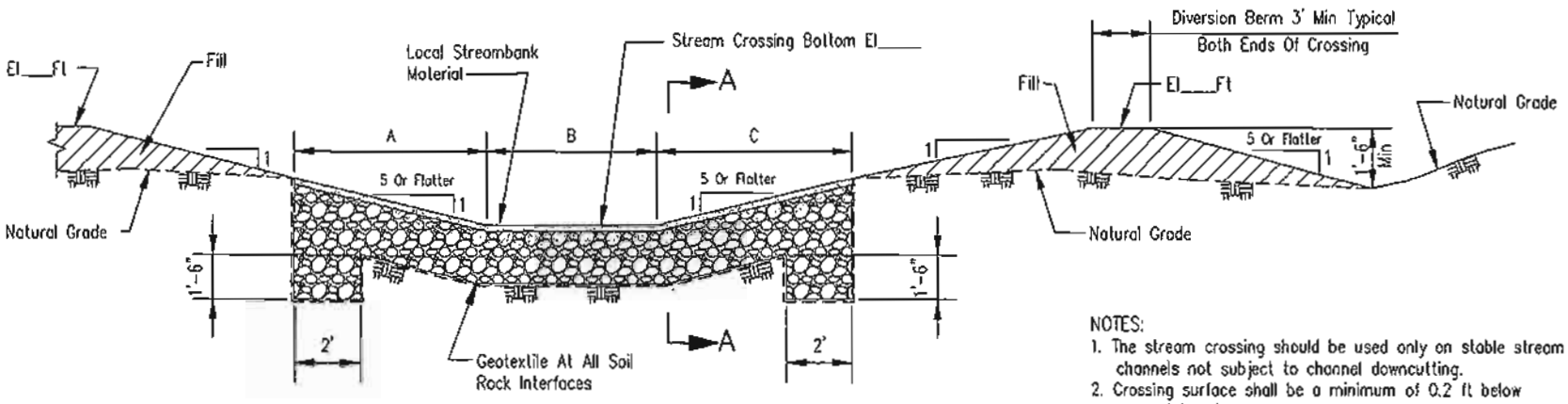
Land Evaluation Factor For Site= 79

Note: A Soil Classifier could be hired for additional accuracy if desired

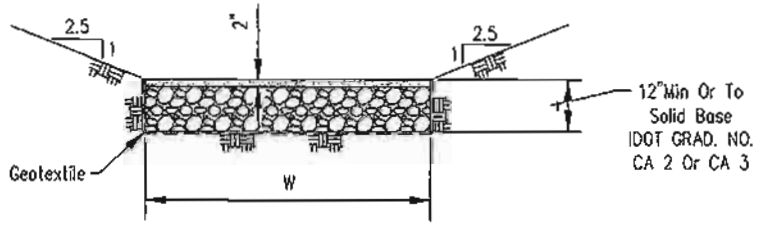
Data Source: Champaign County Digital Soil Survey

NRCS Standards and Drawings

These drawings and standards are included because they are used in situations that are similar, but not exactly like conditions for the wind farm. They can be used by engineers in final designs as they see fit. The stream crossing information will be similar to where the access roads cross grassed waterways and concentrated flow areas with significant water flow. This information will be helpful in keeping the road in place when water flows over it.



PROFILE ALONG CENTERLINE OF CROSSING



SECTION A–A

DIMENSIONS
A = _____(Ft)
B = _____(Ft)
C = _____(Ft)
W = _____(Ft)
Station_____

ESTIMATED QUANTITIES	
Excavation	Cu.Yd.
Coarse Aggregate	Tons.
Geotextile	Sq.Yd.
Seeding	Acres

Landowner		Location	

NOTES:
1. The stream crossing should be used only on stable stream channels not subject to channel downcutting.
2. Crossing surface shall be a minimum of 0.2 ft below channel invert.
3. Surfacing material shall be compacted so that the entire surface is traversed by not less than one tread track of the load hauling equipment.
4. Berms at each end of the crossing shall be constructed to direct surface flow away from excavated crossing, as directed by the engineer.
5. All disturbed areas not covered by gravel shall be seeded in accordance with Critical Area Planting Standard (Practice Code 342).
6. Excavated material shall be removed from site, used for diversion berms or placed at least 12 feet from top edge of back slope and spread so that the height does not exceed 1 foot. The spoil material shall drain freely.
7. Geotextile (non-woven) minimum criteria:
   - Weight of Geotextile (oz/sq.yd.)_____6
   - Tensile strength (lb) ASTM D 4632_____180
   - Elongation at failure (%) ASTM D 4632_____≥ 50
   - Puncture (lb) ASTM D 4833_____80
   - Ultraviolet light (% residual tensile strength) ASTM D 4355_____min 70
   - Apparent opening size (AOS) ASTM D 4751__max 40 sieve
   - Permittivity sec $^{-1}$ ASTM D 4491_____min 0.70
8. Any geotextile splices shall overlap a minimum of 18 inches, with upstream or upslope geotextile overlapping the abutting downslope geotextile.

Date
Designed
Drawn — W. CUNDIFF — 11/00
Checked
Approved

STREAM CROSSING FOR LIVESTOCK

NRCS
Natural Resources Conservation Service
United States Department of Agriculture

File No. IL-ENG-864
Drawing No.

Sheet 1 of 3

NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

STREAM CROSSING

(No.)

CODE 578

DEFINITION

A stabilized area or structure constructed across a stream to provide a travel way for people, livestock, equipment, or vehicles.

PURPOSE

- Improve water quality by reducing sediment, nutrient, organic, and inorganic loading of the stream.
- Reduce streambank and streambed erosion.
- Provide crossing for access to another land unit.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to all land uses where an intermittent or perennial watercourse exists and a ford, bridge, or culvert type crossing is desired for livestock, people, and /or equipment.

CRITERIA

Location. Stream crossings shall be located in areas where the streambed is stable or where grade control can be provided to create a stable condition. Avoid sites where channel grade or alignment changes abruptly, excessive seepage or instability is evident, overfalls exist, or large tributaries enter the stream. Wetland areas shall be avoided if at all possible.

Locate cattle crossings, where possible, out of shady riparian areas to discourage cattle loafing time in the stream.

Stream crossings shall provide a way for normal passage of water, fish and other aquatic animals within the channel during all seasons of the year.

Access Roads. Where high rates of erosion of the adjacent roadways that slope towards the crossing threaten to deliver an excessive amount of sediment to the drainage, install measures to minimize erosion of the roadside ditch, road surface, and/or cut slopes. Where the stream crossing is installed as part of a roadway, the crossing shall be in accordance with NRCS Conservation Practice Standard, 560, Access Road.

Width. The stream crossing shall provide an adequate travel-way width for the intended use. A multi-use stream crossing shall have a travel-way no less than 10 feet wide. "Livestock only" crossings shall be no less than 6 feet wide. Width shall be measured from the upstream end to the downstream end of the stream crossing and shall not include the side slopes.

Side Slopes. All cuts and fills for the stream crossing shall have side slopes that are stable for the soil involved. Side slopes of earth cuts or fills shall be no steeper than 2.5 horizontal to 1 vertical. Rock cuts or fills shall be no steeper than 1.5 horizontal to 1 vertical.

Stream Approaches. Approaches to the stream crossing shall blend with existing site conditions where possible, and shall not be steeper than 4 horizontal to 1 vertical. Unless the foundation geology is otherwise acceptable, the approaches shall be stable, have a gradual ascent or descent grade, and be underlain with suitable material, as necessary, to withstand repeated and long

term use. The minimum width of the approaches shall be equal to the width of the crossing surface.

Surface runoff shall be diverted around the approaches to prevent erosion of the approaches. Roadside ditches shall be directed into a diversion (See Diversion Standard 362) or away from the crossing surface.

Rock. All rock shall be chosen to withstand exposure to air, water, freezing and thawing. When rock is used, it shall be sufficiently large and dense so that it is not mobilized by design flood flows.

Fencing. Areas adjacent to the stream crossing shall be permanently fenced or otherwise excluded as needed to manage livestock access to the crossing.

Cross-stream fencing at fords shall be accomplished with breakaway wire, swinging floodgates, hanging electrified chain or other devices to allow the passage of floodwater debris during high flows.

All fencing shall be designed and constructed in accordance with NRCS Conservation Practice Standard 382, Fence.

Vegetation. All areas to be vegetated shall be planted as soon as practical after construction. When necessary, use of NRCS Conservation Practice Standard 342, Critical Area Planting shall be considered where vegetation is unlikely to become established by natural regeneration, or acceleration of the recovery of vegetation is desired.

Criteria for Culvert and Bridge Crossings

Design of culverts and bridges shall be consistent with sound engineering principles and shall be adequate for the use, type of road, or class of vehicle. Culverts and bridges shall have sufficient capacity to convey the design flow without appreciably altering the stream flow characteristics.

Culverts shall be sized to handle at least the bankfull flow or the peak runoff from the 2-year, 24-hour peak discharge, whichever is less. Crossings shall be adequately protected so that out-of-bank flows safely bypass without structure or streambank damage, or erosion of the crossing fill. Additional culverts may be used at various elevations to maintain terrace or floodplain hydraulics.

The length of the culvert shall be adequate to extend the full width of the crossing, including side slopes. At least one culvert pipe shall be placed on or below grade with the existing stream bottom.

Acceptable culvert materials include concrete, corrugated metal, corrugated plastic, new or used high quality steel and other materials approved by the engineer.

Acceptable bridge materials include concrete, steel, and wood.

Criteria for Ford Crossings

When ford crossings are used, the cross-sectional area of the crossing shall not be less than the natural channel cross-sectional area. A portion of the crossing shall be depressed at or below the average stream bottom elevation when needed to keep base flows or low flows concentrated.

Cutoff walls shall be provided at the upstream and downstream edges of ford-type stream crossings when needed to protect against undercutting.

The finished top surface of the ford type stream crossing in the bottom of the watercourse shall be no higher than the original stream bottom at the upstream edge of the ford crossing. If the downstream edge of the ford crossing is above the original stream bottom, the ford crossing shall be stabilized in accordance with NRCS Conservation Practice Standard 584, Channel Stabilization.

Where rock is used for-ford type stream crossings for livestock, use a hoof contact zone or alternative surfacing method over the surfacing rock.

Concrete Fords

Concrete ford crossings shall be used only where the foundation of the stream crossing is determined to have adequate bearing strength.

Concrete shall have a minimum compressive strength of 3,000 psi at 28 days. Concrete ford crossings shall have a minimum thickness of placed concrete of 5 inches with minimum reinforcement of 6-inch by 6-inch, 6 gauge welded wire fabric. The concrete slab shall be

poured on a minimum 4-inch thick rock base, unless the foundation is otherwise acceptable.

Precast concrete panels may be used in lieu of cast-in-place concrete slabs. Precast concrete units shall comply with ACI 525 or 533, or as otherwise acceptable for local conditions.

When heavy equipment loads are anticipated, the concrete slab shall be designed using an appropriate procedure as described in American Concrete Institute, ACI 360, Design of Slabs on Grade.

Geocell and/or Rock Ford Crossings

Rock ford crossings with geotextile shall be used when the site has a soft or unstable subgrade. Ford crossings made of stabilizing material such as rock riprap are often used in steep areas subject to flash flooding, where normal flow is shallow or intermittent.

Geocell material will not be used if the maximum velocities in the stream exceeds 6 fps.

The bed of the channel shall be excavated to the necessary depth and width and covered with geotextile material. The geotextile material shall be installed on the excavated surface of the ford and shall extend across the bottom of the stream and at least up to the 10-year, 24-hour peak discharge elevation.

The geotextile material shall be covered with at least 6 inches of crushed rock. If using geocells, the cells shall be at least 6 inches deep. All geosynthetic material shall be suitably durable and shall be installed in accordance with the manufacturer's recommendations, including the use of staples, clips and anchor pins.

At minimum, all rock ford stream crossings shall be designed to remain stable during the 10-year, 24-hour peak discharge.

CONSIDERATIONS

Avoid or minimize stream crossings, when possible, through evaluation of alternative trail or travel-way locations.

Ford crossings have the least detrimental impact on water quality when crossing is infrequent. Ford crossings are adapted for crossing wide, shallow watercourses with firm streambeds.

Stream crossings should be located where adverse environmental impacts will be minimized and considering the following:

- Effects on up-stream and down-stream flow conditions that could result in increases in erosion, deposition, or flooding.
- Short term and construction-related effects on water quality.
- Effects on fish passage and wildlife habitats.
- Effects on cultural resources.
- Overall effect on erosion and sedimentation that will be caused by the installation of the crossing and any necessary stream diversion.

Where stream crossings are used, evaluate the need for safety measures such as guardrails at culvert or bridge crossing, or water depth signage at ford crossings.

PLANS AND SPECIFICATIONS

Plans and specifications for stream crossings shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose.

OPERATION AND MAINTENANCE

An operation and maintenance plan shall be developed and implemented for the life of the practice.

The stream crossing, appurtenances, and associated fence should be inspected after each major storm event, with repairs made as needed.

NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

ACCESS ROAD

(Ft.)

CODE 560

DEFINITION

A travel-way for equipment and vehicles constructed as part of a conservation plan.

PURPOSE

To provide a fixed route for vehicular travel for resource activities involving the management of timber, livestock, agriculture, wildlife habitat, and other conservation enterprises while protecting the soil, water, air, fish, wildlife, and other adjacent natural resources.

CONDITIONS WHERE PRACTICE APPLIES

Where access is needed from a private or public road or highway to a land use enterprise or conservation measure, or where travel ways are needed in a planned land use area.

Access roads range from seasonal use roads, designed for low speed and rough driving conditions, to all-weather roads heavily used by the public and designed with safety as a high priority. Some roads are only constructed for a single purpose; i.e. control of forest fires, logging and forest management activities, access to remote recreation areas, or access for maintenance of facilities.

CRITERIA

Access roads shall be designed to serve the enterprise or planned use with the expected vehicular or equipment traffic. The type of vehicle or equipment, speed, loads, soil, climatic, and other conditions under which vehicles and equipment are expected to operate need to be considered. Planned work shall comply with all federal, state and local laws and regulations.

Where general public use is anticipated, roads shall be designed to meet applicable federal, state and local criteria.

Location. Roads shall be located to serve the purpose intended, to facilitate the control and disposal of surface and subsurface water, to control or reduce erosion, to make the best use of topographic features, and to include scenic vistas where possible. The roads should generally follow natural contours and slopes to minimize disturbance of drainage patterns. Roads shall be located where they can be maintained and where water management problems are not created. To reduce potential pollution, roads shall be located away from watercourses. Utilize buffers where possible to protect waterbodies.

Alignment. The gradient and horizontal alignment shall be adapted to the intensity of use, mode of travel, the type of equipment and load weights, and the level of development.

Grades normally should not exceed 10 percent except for short lengths. Maximum grades of 18 percent should only be exceeded if necessary for special uses such as logging roads, field access roads, fire protection roads or other roads not accessible for use by the general public.

For stream crossings, the road should be aligned so that it crosses perpendicular to the channel as much as possible.

Width. The minimum width of the roadbed is 14 ft for one-way traffic and 20 ft for two-way traffic. The roadbed width includes a tread-width of 10 feet for one-way traffic or 16 feet for two-way traffic. Each type of road also requires 2 feet of shoulder width on each side. Single-lane logging or special-purpose roads can have a minimum width of 10 feet, with greater widths at curves and turnouts. The two-way traffic width shall be increased approximately 4 feet for trailer traffic. The shoulder width may be either gravel or grass.

Turnouts shall be used on single lane roads where vehicles travel in both directions on a limited basis. Where turnouts are used, road width shall be increased to a minimum of 20 feet for a distance of at least 30 feet.

Side Slopes. All cuts and fills shall be designed to have stable slopes of a minimum of 2 horizontal to 1 vertical on heights of less than 4 feet. For short lengths, rock areas, or very steep hillsides, steeper slopes may be permitted, if soil conditions warrant and special stabilization measures are installed.

Areas with geological conditions and soils subject to slides shall be avoided or treated to prevent slides.

Drainage. The type of drainage structure used will depend on the intended use and runoff conditions. Culverts, bridges, fords, or grade dips for water management shall be provided at all natural drainage ways. The capacity and design shall be consistent with sound engineering principles and shall be adequate for the class of vehicle, type of road, development, or use. When a culvert or bridge is installed in a drainage way, its minimum capacity shall convey the design storm runoff without causing erosion or road overtopping. Table 1 lists minimum design storm frequencies for various road types.

Table 1

Road Type	Storm Frequency
Forest Access Roads, Farm Field Access Roads	2 year - 24 Hour
Farm Driveways, Recreation Facility Access Roads	10 year - 24 Hour
Public Access Roads, Camp grounds, Etc.	25 year - 24 Hour

An erosion-resistant low point or overflow area may be constructed across the access road to supplement culvert capacity on non-public use roads. Culverts, bridges, fords and hardened overflow areas should be installed so the road crossing does not significantly impact fish migration.

Roadside ditches shall be adequate to provide surface drainage for the roadway and deep enough, as needed to serve as outlets for subsurface drainage. At a minimum, the roadside ditch shall be 1.0 foot below the top of road surface to provide internal drainage. Ditch channels shall be designed to be on stable grades or protected with structures or linings for stability.

Water-breaks or water-bars may be used to control surface runoff on low-intensity use forest, ranch or similar roads. On steep grades where runoff and erosion is anticipated down the road, water bars should be considered. Water bars must be constructed of materials that are compatible with the use and maintenance of the road surface. Water bar discharge areas must be well vegetated or have other erosion resistant materials. See Figure 1 Recommended Spacing of Relief Culverts and Water Bars Based on Soil Type.

Surface crowning can also help direct road runoff into the side drainage ditches. *The road surface shall be sloped toward the ditch at the minimum rate of one-half inch per foot of surface width or crowned at the minimum rate of one-half inch per foot of surface width, measured from the centerline of the road.* Unobstructed flow into the ditches must be maintained to prevent flows from causing

roadside erosion. Provide a turnaround at the end of dead end roads. In some areas, turnarounds may also be desirable for stream, lake, recreation, or other access purposes.

Provide parking space as needed to keep vehicles off the road or from being parked in undesirable locations.

Surfacing. Access roads shall be given a wearing course or surface treatment if required by traffic needs, soil, climate, erosion control, or particulate matter emission control. The type of treatment, if needed, depends on local conditions, available materials, and the existing road base. If these factors or the volume of traffic is not a problem, no special treatment of the surface is required. On weak bearing capacity soils such as silts, organics, and clays, the surface treatment should be underlain with a geotextile material specifically designed for road stabilization applications when the road is used on a regular basis.

Unsurfaced roads may require controlled access to prevent damage or hazardous conditions during adverse climatic conditions.

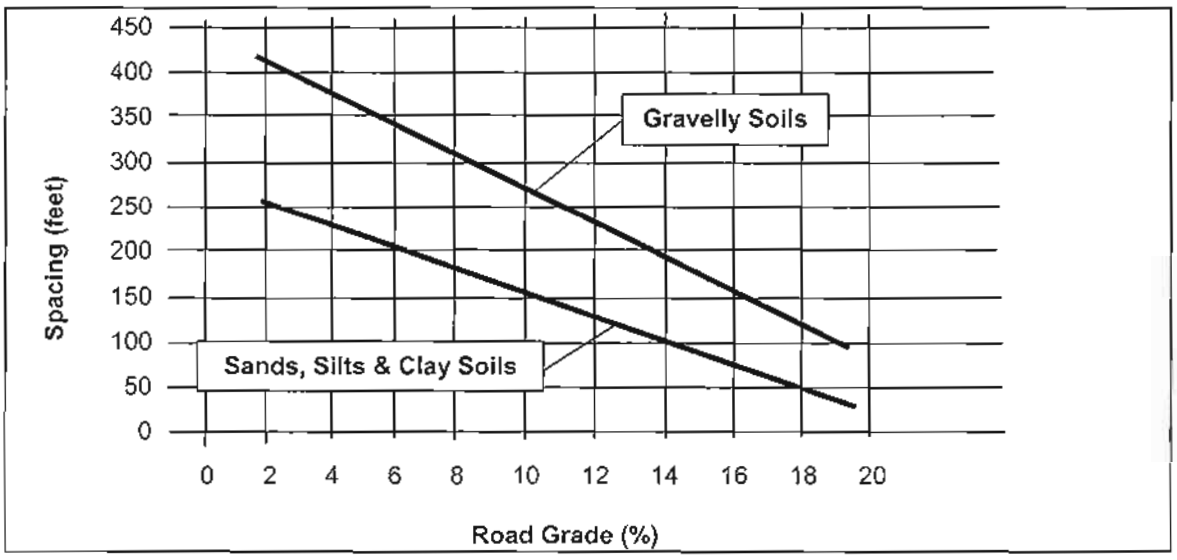
Toxic and acid-forming materials shall not be used on roads. This should not be construed to prohibit use of chemicals for dust control and snow and ice removal after considering potential impacts on stabilizing vegetation.

Utilize additional conservation practices to reduce the potential for generation and transport of particulate matter emissions.

Construction Operations. Construction operations should be carried out in such a manner that erosion and air and water pollution are minimized and held within legal limits. Construction shall include the following requirements as necessary for the job:

1. Trees, stumps, roots, brush, weeds, and other objectionable material shall be removed from the work area.
2. Unsuitable material shall be removed from the roadbed area.
3. Grading, sub-grade preparation, and compaction shall be done as needed.
4. Surfacing shall be done as needed.
5. Measures must be in place to limit the generation of particulate matter during construction.

Figure 1
Recommend Spacing of Relief Culverts and Water Bars Based on Soil Types



Traffic Safety. Passing lanes, turnouts, guardrails, signs, and other facilities as needed for safe traffic flow shall be provided. Traffic safety shall be a prime factor in selecting the angle and grade of the intersection with public highways. Preferably, the angles shall be not less than 85 degrees. The public highway shall be entered either at the top of a hill or far enough from the top or a curve to provide visibility and a safe sight distance. The clear sight distance to each side shall not be less than 300 feet or as required by local regulations.

Erosion Control. If soil and climatic conditions are favorable, roadbanks and disturbed areas shall be vegetated as soon as possible and skid trails, landings, logging, and similar roads shall be vegetated after harvesting or seasonal use is completed (see Critical Area Planting, IL-342). If the use of vegetation is precluded and protection against erosion is needed, protection shall be provided by non-vegetative materials, such as gravel or other organic or inorganic material (see Mulching, IL-484), or in accordance with local regulations.

Roadside channels, cross drains, and drainage structure inlets and outlets shall be designed to be stable (see Structure for Water Control IL-587). If protection is needed, riprap or other similar materials shall be used.

Watercourses and water quality shall be protected during and after construction by erosion-control facilities and maintenance. Filter strips, water and sediment control basins, and other conservation practices shall be used and maintained as needed.

CONSIDERATIONS

Consider visual resources and environmental values during the planning and designing of the road system.

When available, consider using organic bio-degradable materials as a surface treatment.

Access roads should be located where minimal adverse impacts will affect wetlands, waterbodies wildlife habitat, and air quality. Consideration should be given to the following:

- Effects on downstream flows or aquifers that would affect other water uses or users.
- Effects on the volume and timing of downstream flow to prohibit undesirable environmental, social, or economic effects.
- Short-term and construction-related effects of this practice on the quality of on-site downstream water courses.
- Overall effects on erosion and the movement of sediment, pathogens, and soluble and sediment-attached substances that would be carried by runoff from construction activities.
- Effects on wetlands and water-related wildlife habitats that would be associated with the practice.
- Establishing vegetation on road shoulders wider than the 2-4 ft.
- Limiting the number of vehicles and vehicle speed will reduce the potential for generation of particulate matter and decrease safety and air quality concerns.

Applicable Laws and Regulations

Surface Mining Control and Reclamation Act of 1997.

PLANS AND SPECIFICATIONS

Plans and specifications for constructing access roads shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose.

Construction shall include the following requirements as necessary for the job:

1. *Trees, stumps, roots, brush, weeds, and other objectionable material shall be removed from the work area.*

2. *Unsuitable material shall be removed from the roadbed area.*
3. *Grading, sub-grade preparation, and compaction shall be done as needed.*

***SURFACING SHALL BE DONE AS NEEDED.*OPERATION AND MAINTENANCE**

An operation and maintenance plan will be developed and carried out for the life of the practice:

1. Inspect culverts, roadside ditches, water bars and outlets after each major runoff event and restore flow capacity as needed.
2. Minimize the damage to vegetative buffers adjacent to the road when it is necessary to chemically treat the road surface to maintain erosion protection.
3. Maintain vegetated areas in adequate cover to meet the intended purpose(s).
4. Fill low areas in travel treads and re-grade, as needed, to maintain road cross section.
5. Inspect roads with water-bars periodically to insure proper cross section is available and outlets are stable.
6. Conservation practices that limit particulate matter emissions should be incorporated into long-term maintenance plans.

General Information

This section contains general information on topics related to the wind farm and an explanation of some of the terms in the tables used.

Ag Preservation Districts

Agricultural Areas (Ag Preservation Districts) are districts that are approved by the County Board. The purpose of Ag Areas is to recognize the importance of agriculture to local economies and protect producers from policies or actions that conflict with production agriculture. Producers in an Ag Area are protected from local laws, nuisance ordinances, special benefit assessments, and projects which lead to the conversion of agricultural land to other uses. Although relatively little land is converted from agriculture during the construction of wind farms, they are not allowed in an approved Ag Area. At this time, there are no Ag Areas in ChampaignCounty.

Archaeological Information

The term 'cultural resources' refers to all the past activities and accomplishments of people. Cultural resources include buildings, objects made or used by people, locations of human activity, and less tangible things like stories or traditions. The Soil and Water Conservation District most often encounters cultural resources as non-structural archaeological sites. Archaeological sites often extend below the soil surface and must be protected against damaging disruption. Cultural resources are considered a non-renewable resource.

Landowners have ownership of historical properties on their land. However, the State of Illinois owns any human remains, grave markers, burial mounds, or artifacts associated with graves and human remains. If an earth moving activity disturbs any human remains the landowner is required by law to inform the county coroner within 48 hours of the discovery.

The National Historic Preservation Act of 1966 (NHPA Section 106) requires all Federal Agencies to take cultural resources into account when engaging in any undertakings. The Illinois State Agency Historic Resources Preservation Act (Public Act 86-707) requires consultation with the Illinois Historic Preservation Agency for any public or private undertakings involving State Agencies. Undertakings that involve Agencies include not only government-funded projects, but also projects subject to a wide range of Federal and State permitting and licensing activities.

Due to the size of the project area and the nature of the California Ridge project, a cultural resource review was not conducted by the Natural Resources Conservation Service Archaeologist. The applicant should contact the Illinois Historic Preservation Agency for information about compliance with Federal and State cultural resource regulations.

It is apparent that Invenergy has already made contact with the Illinois Historic Preservation Agency. In the Building Permit Application presented to the Champaign County Board, Appendix E contains correspondence from the Agency. Due to the fact that this correspondence is dated, it is highly recommended that Invenergy renew contact with the Illinois Historic Preservation Agency.

Drainage and Runoff Patterns

Included in this report are high-resolution ortho imagery maps with drainage patterns highlighted. Most of the areas highlighted on the maps illustrate areas where surface water runoff becomes concentrated. Significant flows of surface water runoff generally occur during major storm events, but can also occur with less intense precipitation events when soil conditions are not conducive to water infiltration. Planners, engineers, construction crews, and maintenance crews all find drainage pattern information useful due in part to the fact that drainage ways are areas where structures are most likely to receive damage from erosion. Careful planning and preparation of these areas will help reduce construction site and structural damage while also protecting natural resources.

Channels, swales, or other areas where surface water becomes concentrated as it moves across the landscape are generally referred to as *areas of concentrated flow*. The flows in the areas highlighted on the individual site maps range from very small to very large. Many small areas of concentrated flow drain only a few acres and require only traditional erosion control measures. Larger areas drain several hundred acres and can experience intense flows with large amounts of energy. It is important to note that highlights on the maps are in no way intended to indicate the amount of water moving through an area, delineate any waterways, or indicate any high water marks. The purpose of the highlights is to aid the viewer in locating drainage patterns in the imagery. Individual site sheets contain more detailed information regarding the specific areas highlighted on the maps.

Areas of concentrated flow occur on a majority of construction sites in the California Ridge Project. Many of the access roads and some of the turbine sites intersect or are very near areas of concentrated flow. As mentioned earlier, the purpose of the highlights on the maps is to aid the viewer in locating drainage patterns, not to indicate that construction in these areas is impossible. Construction methods to protect access roads against erosion can be as simple as using larger grades of gravel in drainage areas and may pose no major inconvenience to construction. It is for this reason that smaller areas of concentrated flow have been highlighted. Final construction designs and micro-siting are to be determined by project engineers and planners, and this information is provided to aid them in locating the most stable sites or to indicate where engineering solutions may need to be considered.

Attached with this report are engineering standards for access roads and stream crossings provided by the Natural Resources Conservation Service (NRCS). As a general recommendation, it is suggested that these standards be utilized for all access roads and the stream crossing standards be utilized any time an access road intersects an area of concentrated flow. Invenergy has expressed interest in going beyond the NRCS standards and utilizing solutions such as engineered concrete surfaces, which can improve the road's resistance to scouring. Engineered concrete and other improvements to NRCS access road and stream crossing standards are encouraged. As an additional general recommendation, excavations and grading around turbine sites should avoid any areas of concentrated flow. Earthmoving in these areas may alter drainage patterns in a negative way.

Subsurface Drainage

Foundation excavations, access roads, and underground transmission lines all pose threats to underground drainage tile. Destroying or damaging drainage tile can have significant effects on both the damaged area and areas upstream of the damage. It is likely that during construction activities Invenergy will encounter numerous drainage tiles of various types of construction and at varying depths. Trenching and excavations are not the only threats to subsurface drainage. Heavy equipment moving across a field can crush or damage tile and the effects may not be seen for many months or even years. Oftentimes tile damage will not be visible until a storm event saturates the soil enough to cause rapid water movement through a tile and erosion around the damaged area.

NOTE: Any crushed or destroyed tile shall be replaced with the same size tile, to the same depth and grade as it was pre-construction. Should the tile be located at a turbine pad, near or adjacent to an access road or underground cable, it should be re-routed and replaced to the same size, depth, and grade as it was previous.

More information about policies governing the installation of artificial drainage can be found in the wetland information section of this report.

Ecologically Sensitive Areas

Biological diversity, or biodiversity, is the range of life on our planet. A more thorough definition is presented by botanist Peter H. Raven: "At the simplest level, biodiversity is the sum total of all the plants, animals, fungi and microorganisms in the world, or in a particular area; all of their individual variation; and all of the interactions between them. It is the set of living organisms that make up the fabric of the planet Earth and allow it to function as it does, by capturing energy from the sun and using it to drive all of life's processes; by forming communities of organisms that have, through the several billion years of life's history on Earth, altered the nature of the atmosphere, the soil and the water of our Planet; and by making possible the sustainability of our planet through their life activities now." (Raven 1994)

The reasons for protecting biological diversity are complex, but they fall into a few major categories. First, loss of diversity generally weakens entire natural systems. Healthy ecosystems tend to have many natural checks and balances. Every species plays a role in maintaining this system. When simplified by the loss of diversity, the system becomes more susceptible to natural and artificial perturbations. The chances of a system-wide collapse increase.

Simplified ecosystems are almost always expensive to maintain. For example, when synthetic chemicals are relied upon to control pests, the target species are not the only ones affected. Their predators are almost always killed or driven away, exasperating the pest problem. In the meantime, people are unintentionally breeding pesticide-resistant pests.

A second reason for protecting biological diversity is that it represents one of our greatest untapped resources. Great benefits can be reaped from a single species. About 20 species provide 90% of the world's food. Of these 20, just three, wheat, corn and rice-supply over one half of that food. American wheat farmers need new varieties every 5 to 15 years to compete with pests and diseases. Wild strains of wheat are critical genetic reservoirs for these new varieties.

The third reason for protecting diversity is that humans benefit from natural areas and depend on healthy ecosystems. The natural world supplies our air, our water, our food and supports human economic activity. Historically, the lack of attention to biological diversity, and the ecological processes it supports, has resulted in economic hardships for segments of the human population.

Identification of Ecologically Sensitive Areas

The Illinois Natural Areas Inventory is a survey of high quality natural areas and other significant natural features that was originally conducted from 1975-1978. The inventory has been updated since 1978 and is maintained by the Illinois Department of Natural Resources. Areas identified in the survey are on both private and public land and contain important remnants of historical biodiversity.

The Illinois Nature Preserves Commission works with private and public landowners to protect high quality natural areas and habitats of threatened and endangered species. Landowners who dedicate or register their property into the Illinois Nature Preserve System can retain the title to their property, receive tax incentives, and receive stewardship assistance with their property.

It is apparent that Invenergy has already taken steps to identify ecologically sensitive areas that may be impacted by construction. In the Building Permit Application presented to the Vermilion County Board, Appendix E contains a detailed list and description of state-owned or controlled lands, county-owned or controlled lands, Nature Preserves, Land and Water Reserves, and Illinois Natural Areas Inventory Sites that lie in or near the project area. This portion of Appendix E is found on pages 171-206, 228-232, and pages 237-265 of the document. Although Invenergy has already received extensive information through its previous contact with the Illinois Department of Natural Resources, much of the information included in the Building Permit Application is more than two years old. As inventories of sensitive areas are continually updated, it is highly recommended that Invenergy obtain an updated Eco-CAT (Ecological Compliance Assessment Tool) Report from the Department.

Erosion and Sediment Control

Erosion is the wearing away of the soil by water, wind, and other forces. Soil erosion threatens the Nation's soil productivity and contributes the most pollutants in our waterways. Water causes about two thirds of erosion on agricultural land. Four properties, mainly, determine a soil's erodibility: texture, slope, structure, and organic matter content.

Slope has the most influence on soil erosion potential when the site is under construction. Erosivity and runoff increase as slope grade increases. The runoff then exerts more force on the particles, breaking their bonds more readily and carrying them farther before deposition. The longer water flows along a slope before reaching a major waterway, the greater the potential for erosion.

Soil erosion during and after this proposed construction can be a primary non-point source of water pollution. Eroded soil during the construction phase can create unsafe conditions on roadways, decrease the storage capacity of lakes, clog streams and drainage channels, cause deterioration of aquatic habitats, and increase water treatment costs. Soil erosion also increases the risk of flooding by choking culverts, ditches and storm sewers, and by reducing the capacity of natural and man-made detention facilities.

The general principles of erosion and sedimentation control measures include:

- reducing or diverting flow from exposed areas, storing flows or limiting runoff from exposed areas,
- staging construction in order to keep disturbed areas to a minimum,
- establishing or maintaining or temporary or permanent groundcover,
- retaining sediment on site and
- properly installing, inspecting and maintaining control measures.

Erosion control practices are useful controls only if they are properly located, installed, inspected and maintained.

The Soil and Water Conservation District recommends an erosion control plan for all building sites, especially if there is a wetland or stream nearby. Additionally, the Illinois Environmental Protection Agency requires an NPDES (National Pollutant Discharge Elimination System) Phase II Permit for wind farm construction activities. As part of this permitting process, the developer is required to have a Storm Water Pollution Prevention Plan (SWPPP).

An electronic version of the Illinois EPA's NPDES Phase II IL-R10 General Construction permit can be found online at: http://www.epa.state.il.us/water/permits/storm-water/general-construction-permit.pdf.

A Storm Water Pollution Prevention Plan involves the use of best management practices for construction sites. Included in the references section of this report is a link to the Illinois Urban Manual. This is one of the most comprehensive lists of Illinois-specific erosion control best management practices available. This manual is developed by the Illinois Urban Manual Steering and Technical Committees, the Association of Illinois Soil and Water Conservation Districts, the Illinois EPA, and the USDA Natural Resources Conservation Service (NRCS). This manual, along with other engineering standards developed by the NRCS and the Illinois Department of Agriculture, is a valuable source of information for the implementation of best management practices on construction sites.

Soils Information

There are wide variations in the characteristics of soils that have the potential to affect any sort of land use for a given area, whether the land use is agricultural or involves high disturbance construction activities. Soil types and their properties can vary greatly even on small tracts of land. Understanding the location and the characteristics of different soil types are important in the process of siting a project and in determining engineering and construction methods.

Soil maps of each construction area are included with this report. Each soil type shown has a map unit number followed by a letter indicating the slope class. The soil polygons illustrated on the maps indicate the extent of each specific soil type. The individual site maps can be used to reference the soil interpretive ratings chart and identify land use concerns for a site.

Although the soil maps indicate the location of specific soil types, soils do not function entirely independent of one another. Their behavior can depend upon other adjacent soil types and their position in the landscape. Artificial drainage and compaction can also have effects.

SOIL INTERPRETATION RATINGS

Soil properties influence site selection, structure design, construction, and maintenance. Soil interpretive ratings are intended to help users understand how soil properties affect its behavior when a soil is used for nonagricultural uses. This report can be used to identify the limitations of a particular soil type for a specific land use. Understanding the limitations that a soil type presents can help engineers address these problems and prevent construction failures.

Soil properties listed on the soil interpretation summary chart include percent slope, seasonal high of the water table and months during which the high water table is likely to occur, soil drainage class, surface water runoff class, susceptibility to water erosion, hydric classification, the potential for the soil to corrode concrete and steel, the soil's suitability for the construction of roads, and the soil's suitability for shallow excavations. The listing of a limitation on an activity does not mean that the proposed activity cannot be completed on that soil type, but it is important to be aware of the potential difficulties present. The soil ratings for this report are for soils in their natural state, and engineering solutions may be available to modify soils to become more suitable for the proposed use. The soil interpretation information presented does not eliminate the need for more detailed on-site study and testing.

The following soil ratings and explanations are from the Soil Survey of Vermilion County (USDA- Natural Resources Conservation Service, 2006), the Soil Survey Manual (USDA- Soil Survey Division Staff, 1993), Field Indicators of Hydric Soils in the United States (USDA- Natural Resources Conservation Service, 2010), and the National Soil Survey Handbook (USDA- Natural Resources Conservation Service, 2010).

WATER TABLE

Water table refers to a saturated zone in the soil. Table 1 indicates the depth to the top (upper limit) and base (lower limit) of the saturated zone for the specified months in most years. Estimates of the

upper and lower limits are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

The table also shows the kind of water table, that is, apparent or perched. An apparent water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. A perched water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

NATURAL DRAINAGE CLASSES

Natural drainage class refers to the frequency and duration of wet periods under conditions similar to those under which the soil developed. Alteration of the water regime by man, either through drainage or irrigation, is not a consideration unless the alterations have significantly changed the morphology of the soil. The classes follow:

Excessively Drained. Water is removed very rapidly. The occurrence of internal free water commonly is very rare or very deep. The soils are commonly coarse-textured and have very high hydraulic conductivity or are very shallow.

Somewhat Excessively Drained. Water is removed from the soil rapidly. Internal free water occurrence commonly is very rare or very deep. The soils are commonly coarse-textured and have high saturated hydraulic conductivity or are very shallow.

Well Drained. Water is removed from the soil readily but not rapidly. Internal free water occurrence commonly is deep or very deep; annual duration is not specified. Water is available to plants throughout most of the growing season in humid regions. Wetness does not inhibit growth of roots for significant periods during most growing seasons. The soils are mainly free of the deep to redoximorphic features that are related to wetness.

Moderately Well Drained. Water is removed from the soil somewhat slowly during some periods of the year. Internal free water occurrence commonly is moderately deep and transitory through permanent. The soils are wet for only a short time within the rooting depth during the growing season, but long enough that most mesophytic crops are affected. They commonly have a moderately low or lower saturated hydraulic conductivity in a layer within the upper 1 m, periodically receive high rainfall, or both.

Somewhat Poorly Drained. Water is removed slowly so that the soil is wet at a shallow depth for significant periods during the growing season. The occurrence of internal free water commonly is shallow to moderately deep and transitory to permanent. Wetness markedly restricts the growth of mesophytic crops, unless artificial drainage is provided. The soils commonly have one or more of the following characteristics: low or very low saturated hydraulic conductivity, a high water table, additional water from seepage, or nearly continuous rainfall.

Poorly Drained. Water is removed so slowly that the soil is wet at shallow depths periodically during the growing season or remains wet for long periods. The occurrence of internal free water is shallow or very shallow and common or persistent. Free water is commonly at or near the surface long enough during the growing season so that most mesophytic crops cannot be grown, unless the soil is artificially drained. The soil, however, is not continuously wet directly below plow-depth. Free water at shallow depth is usually present. This water table is commonly the result of low or very low saturated hydraulic conductivity of nearly continuous rainfall, or of a combination of these.

Very Poorly Drained. Water is removed from the soil so slowly that free water remains at or very near the ground surface during much of the growing season. The occurrence of internal free water is very shallow and persistent or permanent. Unless the soil is artificially drained, most mesophytic crops cannot be grown. The soils are commonly level or depressed and frequently ponded. If rainfall is high or nearly continuous, slope gradients may be greater.

HYDRIC SOILS

The three essential characteristics of wetlands are hydrophytic vegetation, hydric soils, and wetland hydrology. Criteria for all of the characteristics must be met for areas to be identified as wetlands. Undrained hydric soils that have natural vegetation should support a dominant population of ecological wetland plant species. Hydric soils that have been converted to other uses should be capable of being restored to wetlands.

Hydric soils are defined by the National Technical Committee for Hydric Soils as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part. These soils, under natural conditions, are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established. These criteria are used to identify map unit components that normally are associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (USDA- Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (USDA- Soil Survey Staff, 2006) and in the "Soil Survey Manual" (USDA- Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils are specified in "Field Indicators of Hydric Soils in the United States."

Hydric soils are identified by examining and describing the soil to a depth of about 20 inches. This depth may be greater if determination of an appropriate indicator so requires. It is always recommended that

soils be excavated and described to the depth necessary for an understanding of the redoximorphic processes. Then, using the completed soil descriptions, soil scientist can compare the soil features required by each indicator and specify which indicators have been matched with the conditions observed in the soil. The soil can be identified as a hydric soil if at least one of the approved indicators is present.

Map units that are dominantly made up of hydric soils may have small areas, or inclusions, of nonhydric soils in the higher positions on the landform, and map units dominantly made up of nonhydric soils may have inclusions of hydric soils in the lower positions on the landform. Table 1 lists the map units that include hydric soils. The hydric soils listed meet the definition of a hydric soil and have at least one of the hydric soil indicators. This list can help in planning land uses; however, onsite investigation is recommended to determine the extent of hydric soils on a specific site.

CONCRETE AND STEEL CORROSION

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel or concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than she steel or concrete in installations that are entirely within one kind of soil or within one soil layer. For uncoated steel, the risk of corrosion, expressed as low, moderate, or high, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract. For concrete, the risk of corrosion also is expressed as low, moderate, or high. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

USAGE / LIMITATION CATEGORIES FOR LOCAL ROADS / STREETS AND SHALLOW EXCAVATIONS

The ratings in the tables are both verbal and numerical. Rating classes are expressed in table 1 in terms that indicate the extent to which the soils are limited by all of the soil features that affect a specified use or in terms that indicate the potential of the soils for the use. The terms used for limitation classes are very limited, somewhat limited, and not limited. Not limited indicates that the soil has features that are very favorable for the specified use. Good performance and low maintenance can be expected. Somewhat limited indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. Very limited indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in table 2 indicate the relative severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate gradations between the point at which a

soil feature has the greatest negative impact on the use and the point at which the soil feature is not a limitation. In table 2, the limitations appear in order from the most limiting to the least limiting. Thus, if more than one limitation is identified, the most severe limitation is listed first and the least severe one is listed last.

There are several limiting factors that affect a soil's rating or limitation category for local roads and streets and shallow excavations. Low strength refers to a soil's ability to support heavy loads. Shrink-swell is a term that refers to the tendency for a soil to swell up when it becomes wet and shrink when it becomes dry. Shrink-swell characteristics can vary widely between different soil types. Soils with significant size differences between wet and dry states can cause damage to roads, foundations, other structures, and even plant roots. Potential for frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of soil and loss of strength on thawing. Frost action occurs when water moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter and depth to the water table are the most important factors considered in evaluating a soil for potential frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table during the winter months are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible to frost action. Frost heave and low soil strength during thawing cause damage to pavements and other rigid structures. Depth to saturated zone simply refers to the depth below the soil's surface at which the soil is saturated with water. The term cutbanks cave refers to the way that a soil behaves during an excavation. It refers to the walls of an excavation having a tendency to cave-in or slough. Soils that are likely to cave-in during excavations can present a serious safety hazard to people working in or around a worksite. Dense layer refers to a very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Dense layers can affect the ease of digging and can affect filling and compacting of excavations. Ponding refers to standing water present in closed depressions. The slope of a soil is the inclination of the land's surface from the horizontal. Percentage of slope is the vertical distance divided by the horizontal distance, then multiplied by 100.

LOCAL ROADS AND STREETS

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or soil material stabilized by lime or cement; and a surface of flexible material (asphalt), rigid material (concrete), or gravel with a binder. The ratings are based on the soil properties that affect the ease of excavation and grading are depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, depth to a water table, ponding, flooding, the amount of large stones, and slope. The properties that affect the traffic-supporting capacity are soil strength, subsidence, linear extensibility (shrink-swell potential), the potential for frost action, depth to a water table, and ponding.

SHALLOW EXCAVATIONS

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for graves, utility lines, open ditches, or other purposes. The ratings are based on the soil properties that influence the ease of digging and the resistance to sloughing. Depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, the amount of large stones, and dense layers influence the ease of digging, filling, and compacting. Depth to the seasonal high water table, flooding, and ponding may restrict the period when excavations can be made. Slope influences the ease of using machinery. Soil texture, depth to the water table, and linear extensibility (shrink-swell potential) influence the resistance to sloughing.

HYDROLOGIC SOIL GROUPS

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms. The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas.

PONDING POTENTIAL

Ponding is standing water in a closed depression. Unless a drainage system is installed, the water is removed only by percolation, transpiration, or evaporation. Table 3 indicates surface water depth and the duration and frequency of ponding. Duration is expresses as very brief if less than 2 days, brief if 2 to 7 days, long if 7 to 30 days, and very long if more than 30 days. Frequency is expressed as none, rare, occasional, and frequent. Rare means that ponding is unlikely but possible under unusual weather conditions (the chance of ponding is nearly 0 to 5 percent in any year); occasional that it occurs, on the

average, once or less in 2 years (the chance of ponding is 5 to 50 percent in any year); and frequent that it occurs, on the average, more than once in 2 years (the chance of ponding is more than 50 percent in any year).

Threatened and Endangered Species

The State of Illinois provides habitat for nearly 500 threatened and endangered species, including over 150 animals and over 300 plants. Approximately 40% of the state's listed species depend on wetlands for survival. The two main causes for species decline are the loss of habitat and the degradation of habitat. While habitat loss is the primary reason for species becoming endangered, the effects of habitat change are not always seen overnight. It is seldom simply a case of individual animals or plants being killed. More often, habitat loss and the resulting species declines are indirectly caused and are the result of cumulative impacts over a period of time. It is because of this slow encroachment of habitat degradation, fragmentation, and loss that wildlife habitat must be looked at on a greater scale than just the project area. Cumulative impacts occur because small amounts of damage are being done in different areas at different times and the long-term, large-scale impacts are overlooked. Thus, it is strongly encouraged to look at habitat management on a regional scale.

It is apparent that Invenergy has already taken steps to identify any Federal or State threatened and endangered species that may occupy or visit the project area. In the Building Permit Application presented to the Champaign County Board, Appendix E contains detailed information on Federally and State listed species. Included on these pages are correspondence from the U.S. Fish and Wildlife Service and the Illinois Department of Natural Resources. Although Invenergy has already received extensive information from multiple agencies, much of the information is dated. Threatened and endangered species are constantly being studied and are regularly added or removed from Federal and State lists. Therefore, it is highly recommended that Invenergy renew contact with the agencies and obtain a new Eco-CAT (Ecological Compliance Assessment Tool) Report from the Illinois Department of Natural Resources.

Watershed and Floodplain Information

A watershed is the area of land that drains into a specific point including a stream, lake or other body of water. High points on the Earth's surface, such as hills and ridges define watersheds. When rain falls in the watershed, it flows across the ground towards a stream or lake. Rainwater picks up and carries pollutants or materials it comes in contact with such as oils, pesticides, and soil.

Most of the California Ridge project area lies upon a broad ridge. The peak of this ridge is a divide between the watersheds of the Middle Fork Vermilion River and the Salt Fork Vermilion River. The

southern side of the ridge falls in the Salt Fork watershed and the northern side falls in the Middle Fork watershed. A sub-watershed map of the project area is included in this section of the report.

In 2007, a watershed plan was written for the Salt Fork Vermilion River. This plan was prepared by the Salt Fork Steering Committee of the Champaign County Soil and Water Conservation District and is entitled *Watershed Implementation Plan for the Upper Salt Fork of the Vermilion River*. This is a comprehensive document describing problems within the watershed and outlining solutions to those problems. This document is available for reference in the Champaign County Soil and Water Conservation District office at 2110 West Park Court Suite C, Champaign, IL 61820. The Middle Fork Vermilion River, although it is designated as a National Wild and Scenic River, does not have a comprehensive watershed plan developed.

Being located in the uppermost reaches of each watershed, the project area does not fall within the Federal Emergency Management Agency's one-hundred year floodplain delineations. The fact that river and stream floodwaters may be unlikely to occur in the project area does not rule out the likelihood that seasonal ponding will occur in isolated spots throughout the area. Seasonal ponding is a common occurrence in swales and low-lying areas of Vermilion County. An indication of seasonal ponding potential can be found in the soils information. Hydric soils indicate the presence of drainageways, areas subject to ponding, or a naturally occurring high water table. These need to be considered along with the floodplain information when developing the site plan. More information regarding hydric soils can be found in the soil interpretations section of this report.

Wetlands Information

Wetlands function in many ways to provide numerous benefits to society. They control flooding by offering a slow release of excess water downstream or through the soil. They cleanse water by filtering out sediment and some pollutants, and can function as rechargers of our valuable groundwater. They also are essential breeding, rearing, and feeding grounds for many species of wildlife. The three criteria for evaluating the presence of a wetland are the presence of hydric soil types, the presence of hydrophytic vegetation, and the presence of water at or near the ground surface.

The California Ridge Project, being predominantly located on the upper reaches of a broad ridge, does not encounter a high concentration of wetlands. However, wetlands do exist in the project area in the vicinity of some proposed construction areas. Included in this report are site maps for the locations where construction areas are near wetlands indicated on National Wetlands Inventory (NWI) Maps. These maps are prepared by the U.S. Fish and Wildlife Service. Indications on NWI maps *do not* give an exact delineation of any wetlands and have been found to both over- and under-represent the actual extent of wetlands on a specific site. In order to be considered a valid wetland determination by the U.S. Department of Agriculture, a wetland delineation must be certified by Natural Resources Conservation Service (NRCS) staff.

Wetlands and the Food Security Act of 1985

The Food Security Act of 1985 set forth important policies regarding wetlands and agriculture. Isolated wetlands that are capable of being farmed are located throughout the United States, and Vermilion County is no exception. Artificial drainage reduces the risk of crop loss due to flooding, ponding, and saturated soils. Uncontrolled drainage of wetlands was understood to pose a risk to the nation's water quality, and the Food Security Act of 1985 sought to address this risk among other issues. Pursuant to the Act, anyone seeking to install tile drainage must inform the Farm Service Agency of their intent. The Farm Service Agency then informs the NRCS, which makes a determination as to whether or not the drainage is allowed at that particular site. This decision is based on wetland determinations performed by NRCS staff and the existence of artificial drainage prior to 1985. If a producer is found to be in violation of these wetland protection policies, it can negatively affect their eligibility for farm program benefits provided by the Farm Service Agency.

These policies also affect the repair or modification of existing tile. Invenergy will inevitably encounter and need to repair existing drainage tile. In order for producers and landowners to maintain their eligibility with the Farm Service Agency, any repairs made to existing tile must follow policy guidelines. If an existing tile is *modified*, the producer or landowner must notify the Farm Service Agency. If an existing tile is *repaired*, there is no need to notify the Farm Service Agency. Examples of modification would include adding new laterals or replacing non-perforated tile with perforated tile. Simply repairing a cut or crushed tile does not constitute modification and there is no need for notification, even if the existing tile is located in a wetland.

NOTE: Any crushed or destroyed tile shall be replaced with the same size tile, to the same depth and grade as it was pre-construction. Should the tile be located at a turbine pad, substation, operations and maintenance buildings, near or adjacent to an access road or the underground cable, it should be re-routed and replaced to the same size, depth, and grade as it was previous.

Turbine Sites

This section contains specific information about each site and situations that should be addressed to minimize erosion on access roads and turbine sites. This information was developed before harvest and will be verified after harvest to determine which sites will be most vulnerable to increased erosion hazards.

California Ridge Wind Farm
Turbine #1

Soils Present:

146B2

223B2

232A

Soils Limitations:

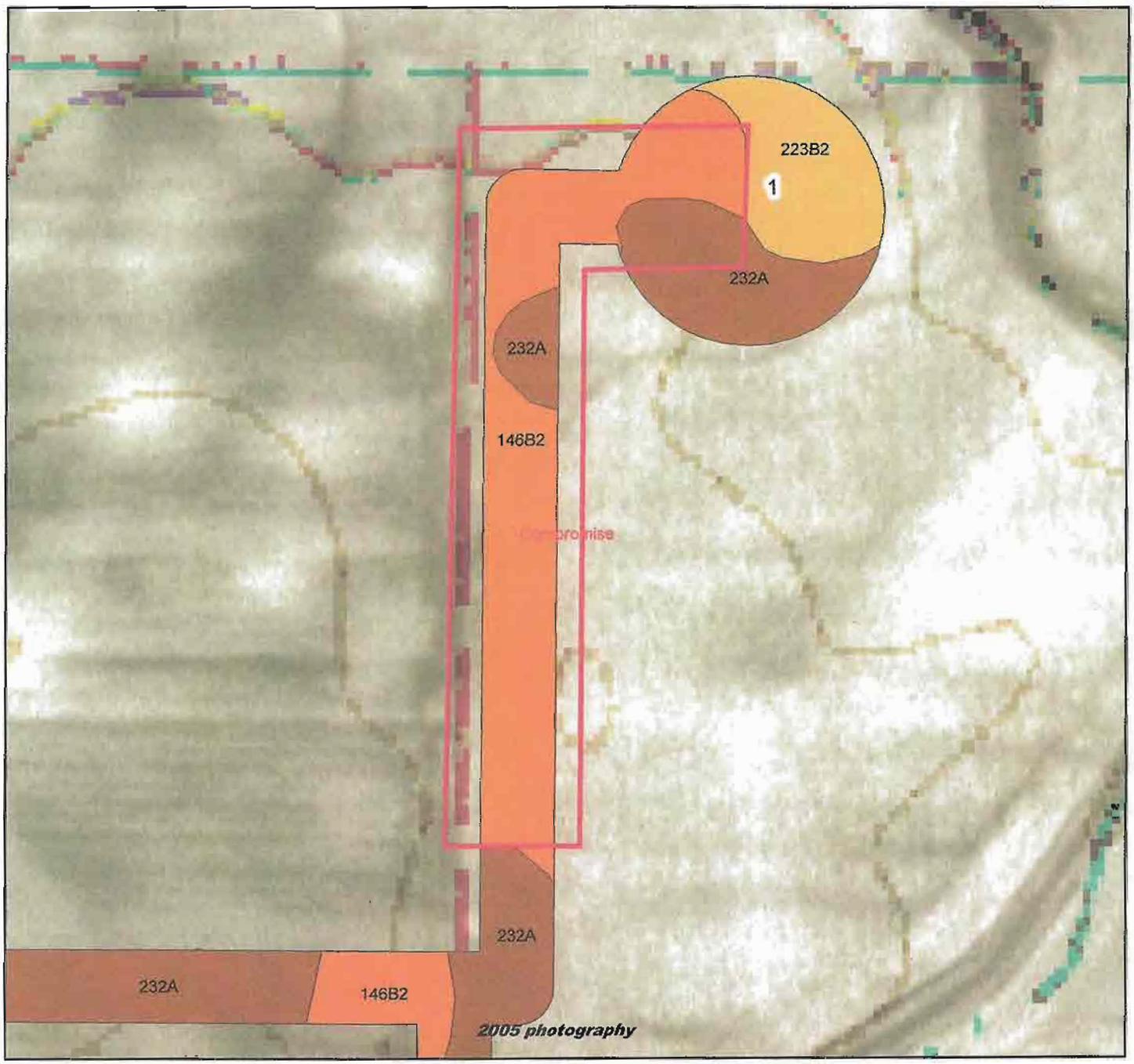
The 146B2 (Elliott Silty Clay Loam) soil has a 2-4% slope that could be an issue with water flowing over the access road possibly causing erosion of the road surface or depositing silt on the access road. The area most susceptible is outlined in a red rectangle.

The 223B2 (Varna Silt Loam) soil has a 2-4% slope and is located adjacent to the turbine and could present erosion issues during and after construction.

Site Limitations:

No significant limitations at this site and associated access road.

California Ridge Wind Farm
Turbine #1



Turbine # 1

Invenergy Construction-Areas-Buffer-Zone Soils Map Data

Soil Map Unit	Name	Slope %	Water Table (feet) / Months	
146B2	Elliott silty clay loam	2-4	1-2	Jan-May
223B2	Varna Silty Clay loam	2-4	2-3.5	Feb-April
232A	Ashkum silty clay loam	0-2	Surface-1	Jan-May

Soil Map Unit	Drainage Class	Erosion Hazard	Hydric Soils	
146B2	Somewhat poorly drained	slight	No	
223B2	Moderately well drained	moderate	No	
232A	Poorly drained	slight	Yes	

0

0

Soil Map Unit	Concrete Corrosion	Steel Corrosion	
146B2	Low	High	
223B2	Moderate	High	
232A	Low	High	

0

0

Soil Map Unit	Local Roads / Streets	Shallow Excavations
146B2	Very limited (1,2,3,4)	Very limited (4,5,6)
223B2	Very limited (1,2,3)	Somewhat limited (4,5,6)
232A	Very limited (1,2,3,4,7)	Very limited (4,5,7)

0

0

1) Low strength
2) Shrink-swell
3) Frost action
4) Depth to saturated zone
5) Cutbanks cave
6) Dense layer
7) Ponding
8) Slope
9) Wetness

California Ridge Wind Farm
Turbine #2

Soils Present:

146B2

232A

Soils Limitations:

The 146B2 (Elliott Silty Clay Loam) soil has a 2-4% slope that could be an issue with water flowing over the access road and turbine parking area possibly causing erosion of the road surface or depositing silt on the access road and parking area. The area most susceptible is outlined in a red rectangle.

Site Limitations:

A concentrated flow area is present just south of the corner where the access road turns to the south. This area will need increased protection to keep it from washing away when water flows over it. It is marked with a red circle with the concentrated flow area a solid red line.

California Ridge Wind Farm
Turbine #2

Turbine # 2

Invenergy Construction-Areas-Buffer-Zone Soils Map Data

Soil Map Unit	Name	Slope %	Water Table (feet) / Months	
146B2	Elliott silty clay loam	2-4	1-2	Jan-May
232A	Ashkum silty clay loam	0-2	Surface-1	Jan-May
56B	Dana Silt Loam	2-5	2-3.5	Feb-April

Soil Map Unit	Drainage Class	Erosion Hazard	Hydric Soils	
146B2	Somewhat poorly drained	slight	No	
232A	Poorly drained	slight	Yes	
56B	Moderately well drained	moderate	no	

0
0

Soil Map Unit	Concrete Corrosion	Steel Corrosion	
146B2	Low	High	
232A	Low	High	
56B	Moderate	Moderate	

0
0

Soil Map Unit	Local Roads / Streets	Shallow Excavations
146B2	Very limited (1,2,3,4)	Very limited (4,5,6)
232A	Very limited (1,2,3,4,7)	Very limited (4,5,7)
56B	Very Limited (1,3)	Very Limited (9)

0
0

1) Low strength
2) Shrink-swell
3) Frost action
4) Depth to saturated zone
5) Cutbanks cave
6) Dense layer
7) Ponding
8) Slope
9) Wetness

California Ridge Wind Farm
Turbine #3

Soils Limitation:

146B2
223C2
223D2
232A

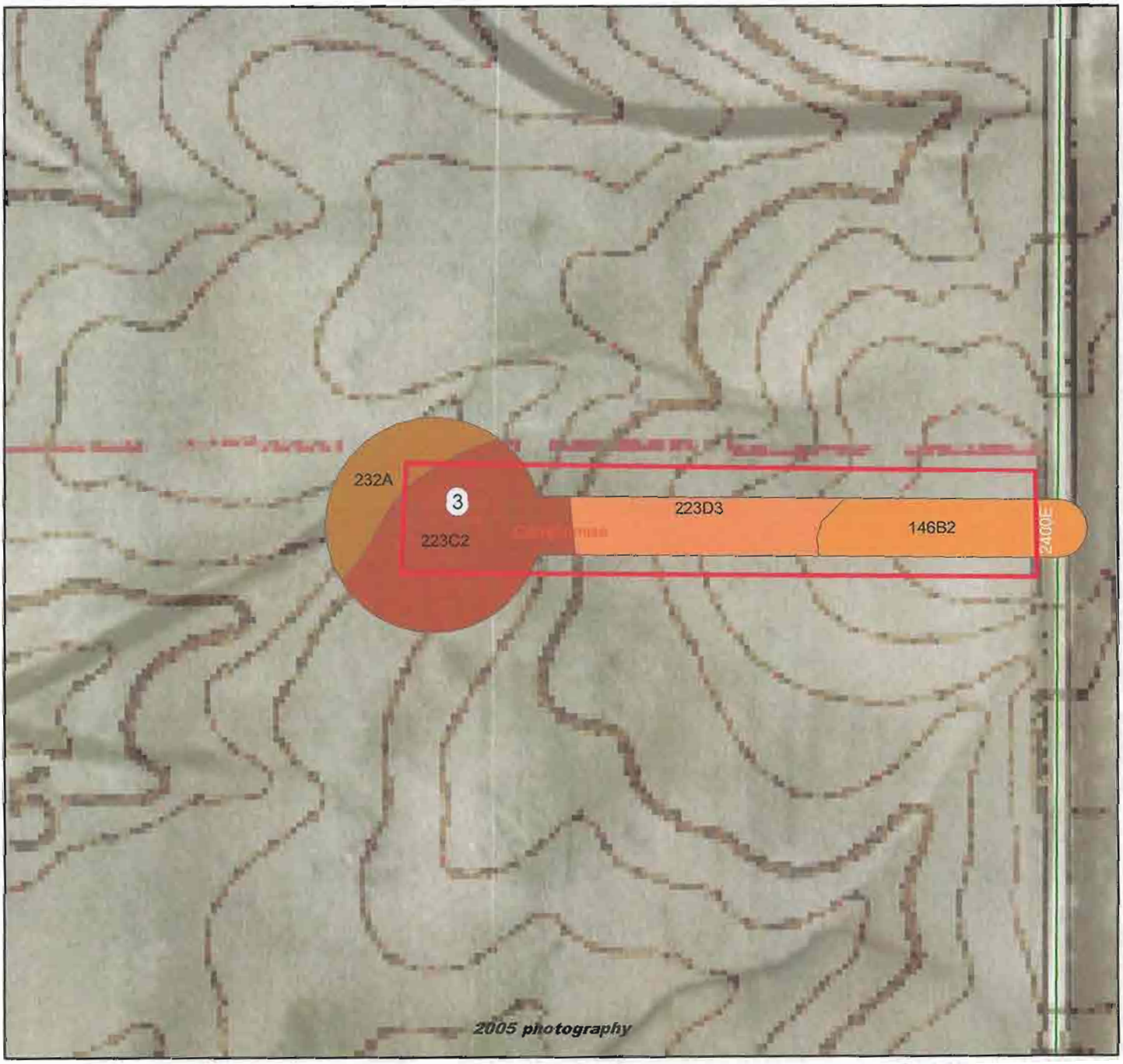
Soils Limitations:

The 146B2 (Elliott Silty Clay Loam) soil has a 2-4% slope and 223C2 and 223D2 soils have a slopes of 2-6% that could cause erosion of the road surface or depositing silt on the access road and parking area. This site could also have erosion issues along the edge of the access road with gully erosion due to the orientation of the slope in relation to the road. The area most susceptible is outlined in a red rectangle.

Site Limitations:

No significant limitations at this site and associated access road.

California Ridge Wind Farm
Turbine #3



Turbine # 3

Invenergy Construction-Areas-Buffer-Zone Soils Map Data

Soil Map Unit	Name	Slope %	Water Table (feet) / Months	
146B2	Elliott silty clay loam	2-4	1-2	Jan-May
232A	Ashkum silty clay loam	0-2	Surface-1	Jan-May
223C2	Varna Silty Clay loam	4-6	2-3.5	Feb-April
223D3	Varna Silty Clay loam	6-12	2-3.5	Feb-April

Soil Map Unit	Drainage Class	Erosion Hazard	Hydric Soils	
146B2	Somewhat poorly drained	slight	No	
232A	Poorly drained	slight	Yes	
223C2	Moderately well drained	moderate	No	
223D3	Moderately well drained	moderate	No	

0

Soil Map Unit	Concrete Corrosion	Steel Corrosion	
146B2	Low	High	
232A	Low	High	
223C2	Moderate	High	
223D3	Moderate	High	

0

Soil Map Unit	Local Roads / Streets	Shallow Excavations
146B2	Very limited (1,2,3,4)	Very limited (4,5,6)
232A	Very limited (1,2,3,4,7)	Very limited (4,5,7)
223C2	Very limited (1,2,3)	Very Limited (9)
223D3	Very Limited (1)	Very Limited (9)

0

1) Low strength
2) Shrink-swell
3) Frost action
4) Depth to saturated zone
5) Cutbanks cave
6) Dense layer
7) Ponding
8) Slope
9) Wetness

California Ridge Wind Farm
Turbine #4

Soils Present:

146B2

223D3

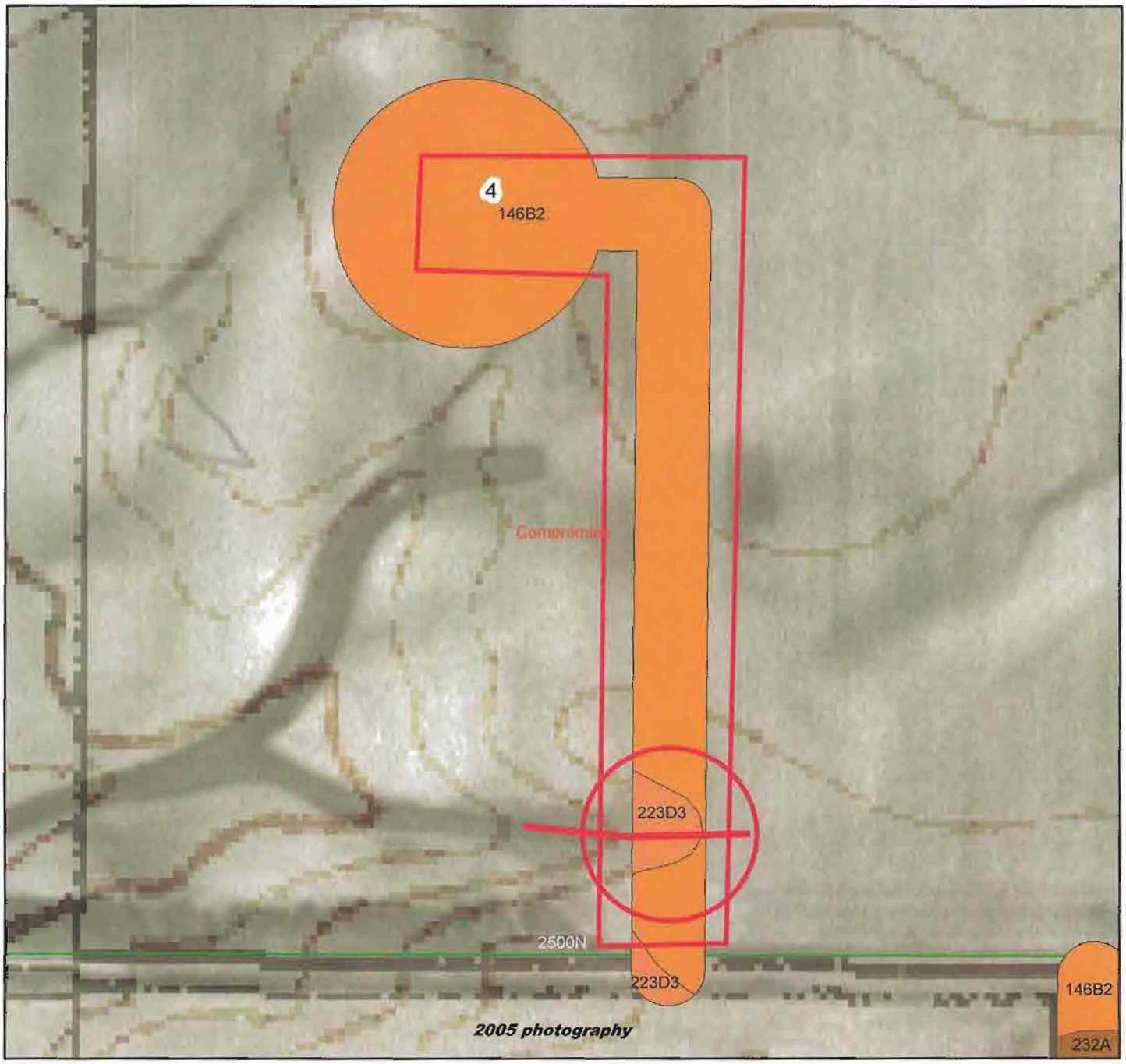
Soils Limitations:

The 146B2 (Elliott Silty Clay Loam) soil has a 2-4% slope and 223D3 soil has significant slopes that could cause erosion of the road surface or depositing silt on the access road and parking area. The area most susceptible is outlined in a red rectangle.

Site Limitations:

A concentrated flow area (see photo) starts near County Road 2500 North intersection that will need increased protection to keep it from washing away when water flows over it. It is marked with a red circle with the concentrated flow area a solid red line.

California Ridge Wind Farm
Turbine #4



Turbine # 4

Invenergy Construction-Areas-Buffer-Zone Soils Map Data

Soil Map Unit	Name	Slope %	Water Table (feet) / Months	
146B2	Elliott silty clay loam	2-4	1-2	Jan-May
223D3	Varna Silty Clay loam	6-12	2-3.5	Feb-April

Soil Map Unit	Drainage Class	Erosion Hazard	Hydric Soils	
146B2	Somewhat poorly drained	slight	No	
223D3	Moderately well drained	moderate	No	
	0			
	0			
	0			

Soil Map Unit	Concrete Corrosion	Steel Corrosion	
146B2	Low	High	
223D3	Moderate	High	
	0		
	0		
	0		

Soil Map Unit	Local Roads / Streets	Shallow Excavations
146B2	Very limited (1,2,3,4)	Very limited (4,5,6)
223D3	Very Limited (1)	Very Limited (9)
	0	
	0	
	0	

1) Low strength
2) Shrink-swell
3) Frost action
4) Depth to saturated zone
5) Cutbanks cave
6) Dense layer
7) Ponding
8) Slope
9) Wetness

California Ridge Wind Farm
Turbine #5

Soils Present:

146B2
232A
481A

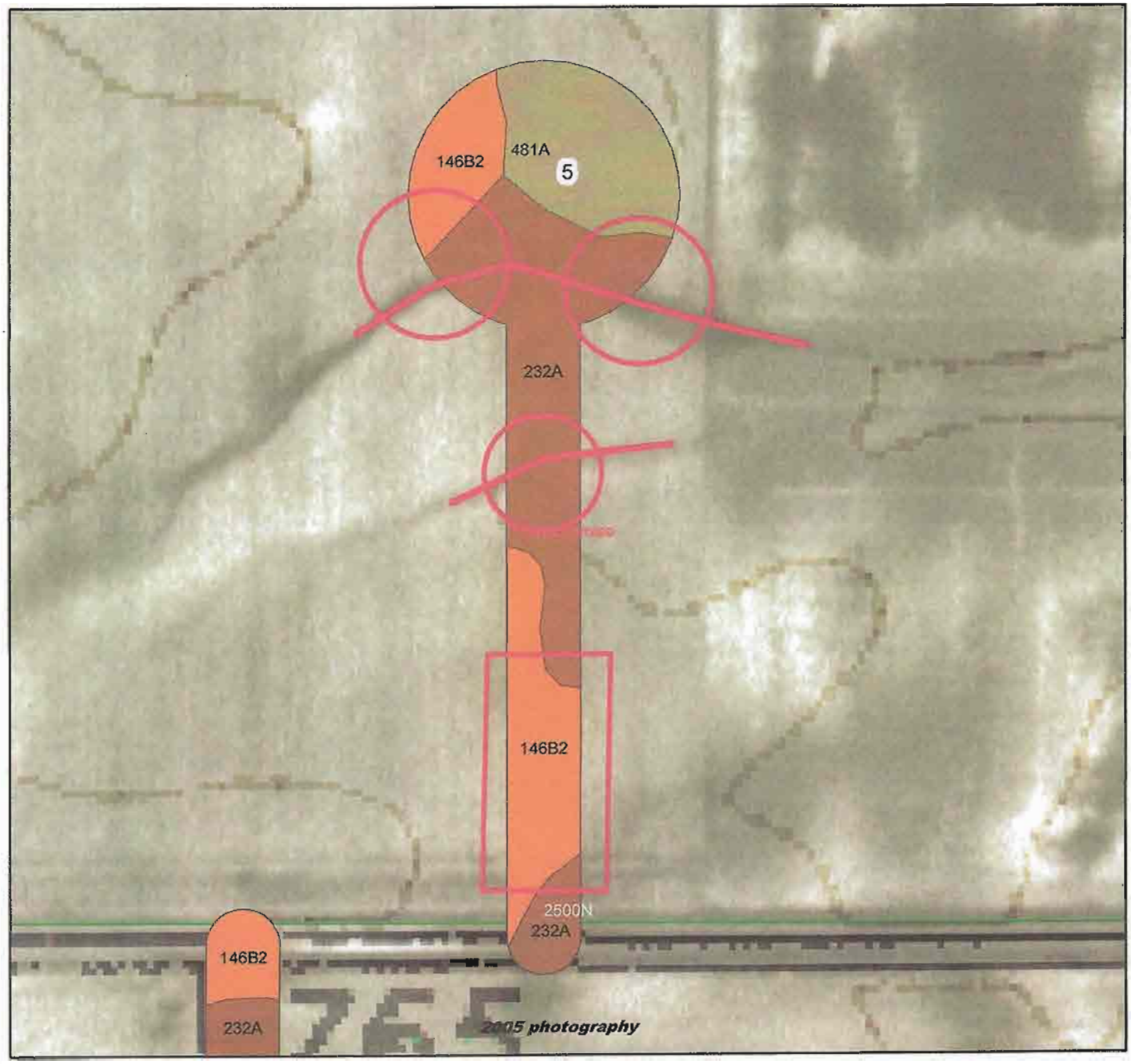
Soil Limitations:

The 146B2 (Elliott Silty Clay Loam) soil has a 2-4% slope that could be an issue with water flowing over the access road possibly causing erosion of the road surface or depositing silt on the access road. The area most susceptible is outlined in a red rectangle.

Site Limitations:

The access road has two sites (see photo) where concentrated flow crosses the road that will need increased protection to keep it from washing away when water flows over it. It is marked with a red circle with the concentrated flow area a solid red line.

California Ridge Wind Farm
Turbine #5



Turbine # 5

Invenergy Construction-Areas-Buffer-Zone Soils Map Data

Soil Map Unit	Name	Slope %	Water Table (feet) / Months	
146B2	Elliott silty clay loam	2-4	1-2	Jan-May
232A	Ashkum silty clay loam	0-2	Surface-1	Jan-May
481A	Raub Silt Loam	0-2	1-2	Jan-May

Soil Map Unit	Drainage Class	Erosion Hazard	Hydric Soils	
146B2	Somewhat poorly drained	slight	No	
232A	Poorly drained	slight	Yes	
481A	Somewhat poorly drained	slight	No	
	0			
	0			

Soil Map Unit	Concrete Corrosion	Steel Corrosion	
146B2	Low	High	
232A	Low	High	
481A	Moderate	Moderate	
	0		
	0		

Soil Map Unit	Local Roads / Streets	Shallow Excavations
146B2	Very limited (1,2,3,4)	Very limited (4,5,6)
232A	Very limited (1,2,3,4,7)	Very limited (4,5,7)
481A	Very Limited (9)	Very Limited (1,3)
	0	
	0	

1) Low strength
2) Shrink-swell
3) Frost action
4) Depth to saturated zone
5) Cutbanks cave
6) Dense layer
7) Ponding
8) Slope
9) Wetness

California Ridge Wind Farm
Turbine #6

Soils Present:

152A
232A
481A

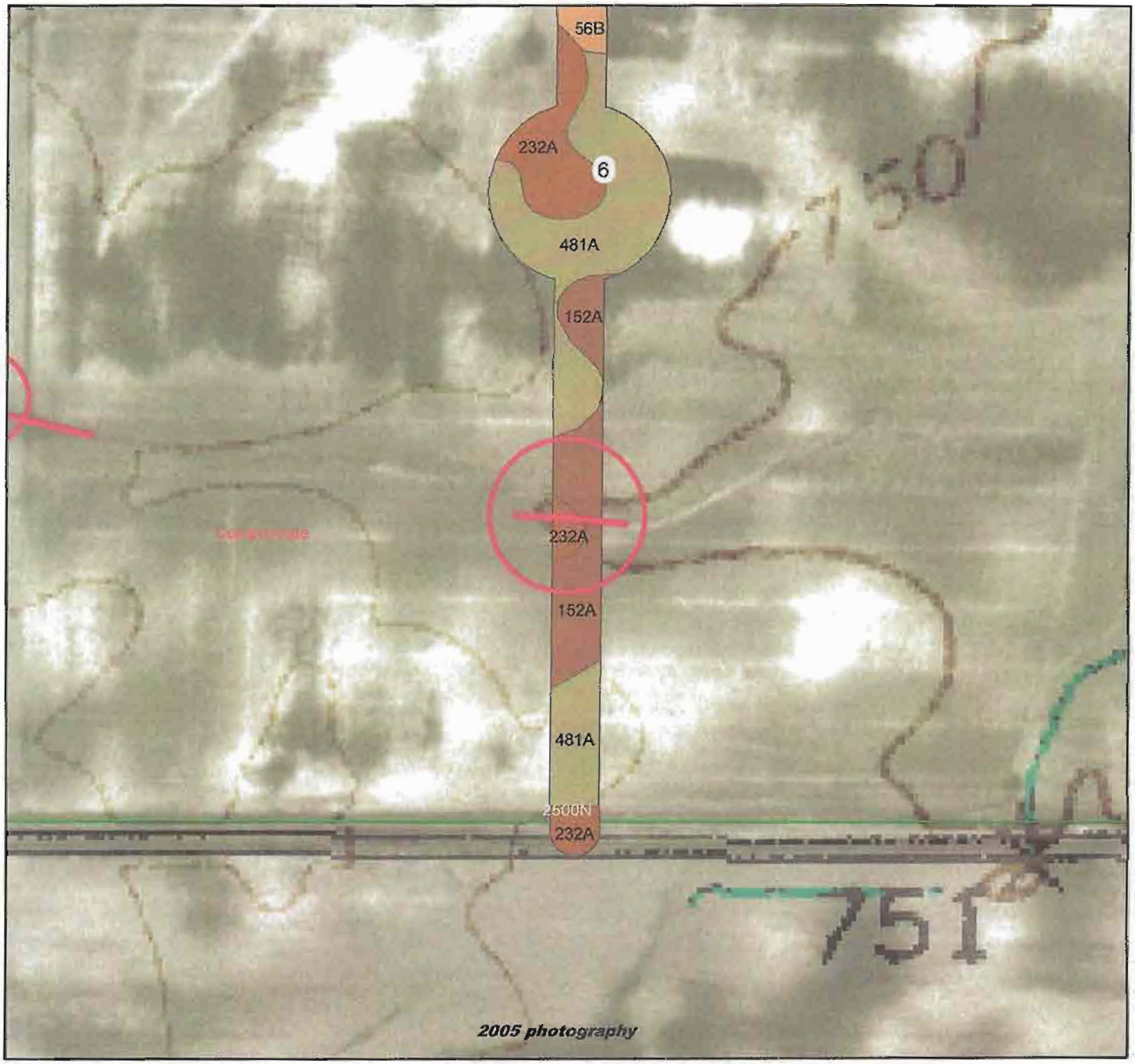
Soil Limitations:

There are no significant soil limitations at this site.

Site Limitations:

The access road has one site (see photo) where concentrated flow crosses the road that will need increased protection to keep it from washing away when water flows over it. It is marked with a red circle with the concentrated flow area a solid red line.

California Ridge Wind Farm
Turbine #6



Turbine # 6

Invenergy Construction-Areas-Buffer-Zone Soils Map Data

Soil Map Unit	Name	Slope %	Water Table (feet) / Months	
152A	Drummer silty clay loam	0-2	Surface-1	Jan-May
232A	Ashkum silty clay loam	0-2	Surface-1	Jan-May
481A	Raub Silt Loam	0-2	1-2	Jan-May

Soil Map Unit	Drainage Class	Erosion Hazard	Hydric Soils	
152A	Poorly drained	slight	Yes	
232A	Poorly drained	slight	Yes	
481A	Somewhat poorly drained	slight	No	

0
0

Soil Map Unit	Concrete Corrosion	Steel Corrosion	
152A	Low	High	
232A	Low	High	
481A	Moderate	Moderate	

0
0

Soil Map Unit	Local Roads / Streets	Shallow Excavations
152A	Very limited (1,2,3,4,7)	Very limited (4,5,7)
232A	Very limited (1,2,3,4,7)	Very limited (4,5,7)
481A	Very Limited (9)	Very Limited (1,3)

0
0

1) Low strength
2) Shrink-swell
3) Frost action
4) Depth to saturated zone
5) Cutbanks cave
6) Dense layer
7) Ponding
8) Slope
9) Wetness

California Ridge Wind Farm
Turbine #7

Soils Present:

146B2
156B
223B2
223D3
232A

Soil Limitations:

The 146B2 (Elliott Silty Clay Loam) soil has a 2-4% slope that could be an issue with water flowing over the access road possibly causing erosion of the road surface or depositing silt on the access road.

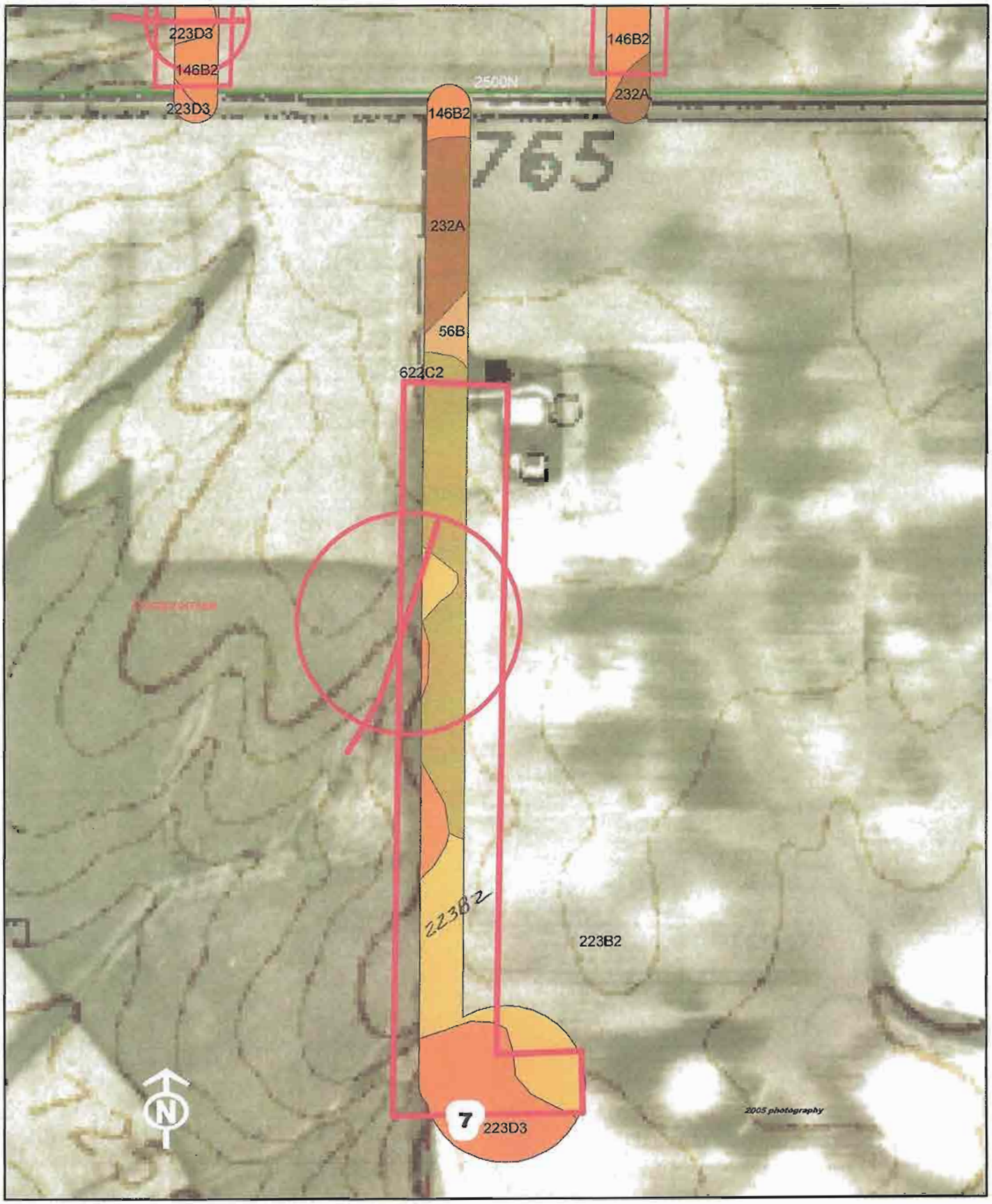
The 223B2 and 223D3 (Varna Silt Loam) soils have significant slopes to them that could be an issue with water flowing over the access road possibly causing erosion of the road surface or depositing silt on the access road and turbine parking area.

The area most susceptible is outlined in a red rectangle.

Site Limitations:

The access road has one site (see photo) where concentrated flow crosses the road that will need increased protection to keep it from washing away when water flows over it. This area begins at the access road location. It is marked with a red circle with the concentrated flow area a solid red line.

California Ridge Wind Farm
Turbine # 7



Turbine # 7

Invenergy Construction-Areas-Buffer-Zone Soils Map Data

Soil Map Unit	Name	Slope %	Water Table (feet) / Months	
56B	Dana Silt Loam	2-5	2-3.5	Feb-April
223B2	Varna Silty Clay loam	2-4	2-3.5	Feb-April
223D3	Varna Silty Clay loam	6-12	2-3.5	Feb-April
232A	Ashkum silty clay loam	0-2	Surface-1	Jan-May
622C2	Wyanet Silt Loam	5-10	>6	All

Soil Map Unit	Drainage Class	Erosion Hazard	Hydric Soils	
56B	Moderately well drained	moderate	No	
223B2	Moderately well drained	moderate	No	
223D3	Moderately well drained	moderate	No	
232A	Poorly drained	slight	Yes	
622C2	Well drained	moderate	No	

Soil Map Unit	Concrete Corrosion	Steel Corrosion	
56B	Moderate	Moderate	
223B2	Moderate	High	
223D3	Moderate	High	
232A	Low	High	
622C2	Moderate	Moderate	

Soil Map Unit	Local Roads / Streets	Shallow Excavations
56B	Very Limited (1,3)	Very Limited (9)
223B2	Very limited (1,2,3)	Somewhat limited (4,5,6)
223D3	Very Limited (1)	Very Limited (9)
232A	Very limited (1,2,3,4,7)	Very limited (4,5,7)
622C2	Very Limited (1)	Somewhat Limited (6)

1) Low strength
2) Shrink-swell
3) Frost action
4) Depth to saturated zone
5) Cutbanks cave
6) Dense layer
7) Ponding
8) Slope
9) Wetness

California Ridge Wind Farm
Turbine #8

Soils Present:

146B2
146C2
223D3
232A

Soil Limitations:

The 146B2 (Elliott Silty Clay Loam) soil has a 2-4% slope and 146C2 has a 4-6% slope that could cause erosion of the road surface or depositing silt on the access road and parking area. This site could also have erosion issues along the edge of the access road with gully erosion due t the orientation of the slope in relation to the road. The area most susceptible is outlined in a red rectangle.

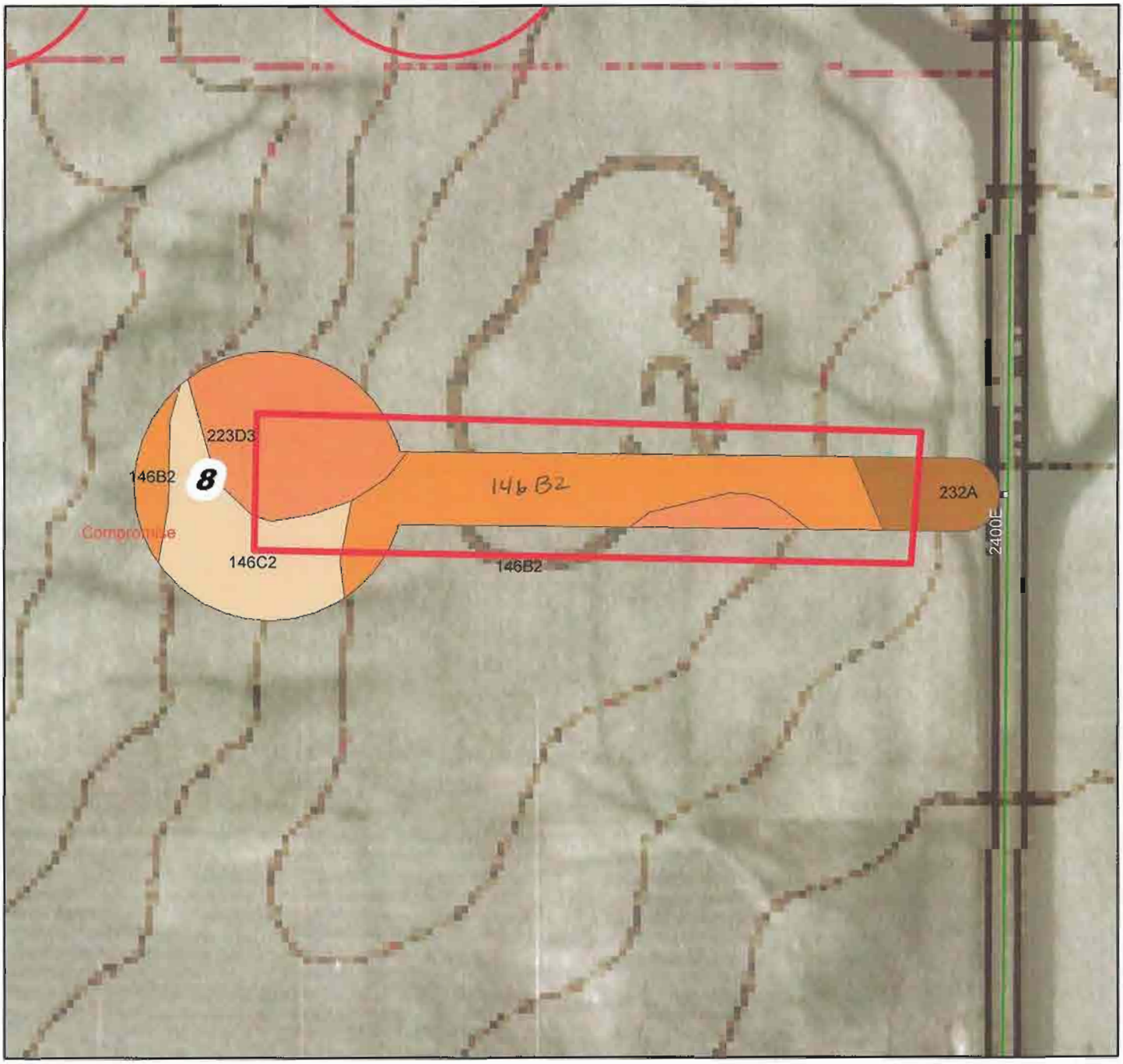
The 223D3 (Varna Silt Loam) soil has significant slopes to them that could be an issue with water flowing over the access road possibly causing erosion of the road surface or depositing silt on the access road and turbine parking area. This site could also have erosion issues along the edge of the access road with gully erosion due to the orientation of the slope in relation to the road.

The area most susceptible is outlined in a red rectangle.

Site Limitations:

No significant limitations at this site and associated access road.

California Ridge Wind Farm
Turbine #8



2005 photography

Turbine # 8

Invenergy Construction-Areas-Buffer-Zone Soils Map Data

Soil Map Unit	Name	Slope %	Water Table (feet) / Months	
146B2	Elliott silty clay loam	2-4	1-2	Jan-May
146C2	Elliott silty clay loam	4-6	1-2	Jan-May
223D3	Varna Silty Clay loam	6-12	2-3.5	Feb-April
232A	Ashkum silty clay loam	0-2	Surface-1	Jan-May

Soil Map Unit	Drainage Class	Erosion Hazard	Hydric Soils	
146B2	Somewhat poorly drained	slight	No	
146C2	Somewhat poorly drained	slight	No	
223D3	Moderately well drained	moderate	No	
232A	Poorly drained	slight	Yes	

0

Soil Map Unit	Concrete Corrosion	Steel Corrosion	
146B2	Low	High	
146C2	Low	High	
223D3	Moderate	High	
232A	Low	High	

0

Soil Map Unit	Local Roads / Streets	Shallow Excavations
146B2	Very limited (1,2,3,4)	Very limited (4,5,6)
146C2	Very limited (1,2,3,4)	Very limited (4,5,6)
223D3	Very Limited (1)	Very Limited (9)
232A	Very limited (1,2,3,4,7)	Very limited (4,5,7)

0

1) Low strength
2) Shrink-swell
3) Frost action
4) Depth to saturated zone
5) Cutbanks cave
6) Dense layer
7) Ponding
8) Slope
9) Wetness

California Ridge Wind Farm
Turbine #9

Soils Present:

146B2
223B2
232A

Soil Limitations:

The 146B2 (Elliott Silty Clay Loam) soil has a 2-4% slope that could be an issue with water flowing over the access road possibly causing erosion of the road surface or depositing silt on the access road.

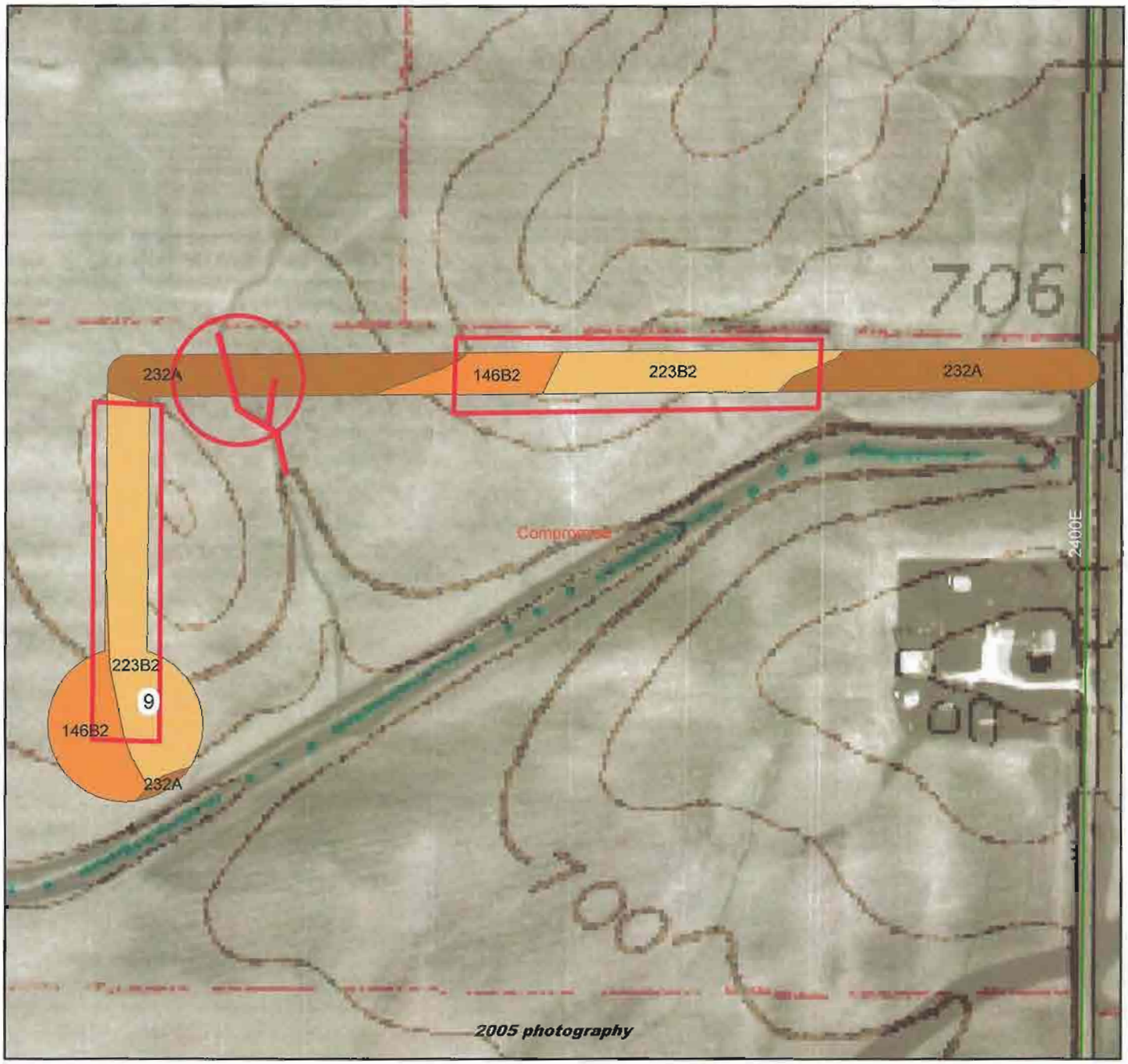
The 223B2 (Varna Silt Loam) soil has 2-4% slopes that could be an issue with water flowing over the access road possibly causing erosion of the road surface or depositing silt on the access road and turbine parking area.

The area most susceptible is outlined in a red rectangle.

Site Limitations:

No significant limitations at this site and associated access road.

California Ridge Wind Farm
Turbine #9



Turbine # 9

Invenergy Construction-Areas-Buffer-Zone Soils Map Data

Soil Map Unit	Name	Slope %	Water Table (feet) / Months	
146B2	Elliott silty clay loam	2-4	1-2	Jan-May
223B2	Varna Silty Clay loam	2-4	2-3.5	Feb-April
232A	Ashkum silty clay loam	0-2	Surface-1	Jan-May

Soil Map Unit	Drainage Class	Erosion Hazard	Hydric Soils	
146B2	Somewhat poorly drained	slight	No	
223B2	Moderately well drained	moderate	No	
232A	Poorly drained	slight	Yes	

0

0

Soil Map Unit	Concrete Corrosion	Steel Corrosion	
146B2	Low	High	
223B2	Moderate	High	
232A	Low	High	

0

0

Soil Map Unit	Local Roads / Streets	Shallow Excavations
146B2	Very limited (1,2,3,4)	Very limited (4,5,6)
223B2	Very limited (1,2,3)	Somewhat limited (4,5,6)
232A	Very limited (1,2,3,4,7)	Very limited (4,5,7)

0

0

1) Low strength
2) Shrink-swell
3) Frost action
4) Depth to saturated zone
5) Cutbanks cave
6) Dense layer
7) Ponding
8) Slope
9) Wetness

California Ridge Wind Farm
Turbine #10

Soils Present:

146B2
152A
223B2
232A

Soil Limitations:

The 146B2 (Elliott Silty Clay Loam) soil has a 2-4% slope that could be an issue with water flowing over the access road possibly causing erosion of the road surface or depositing silt on the access road and turbine parking area.

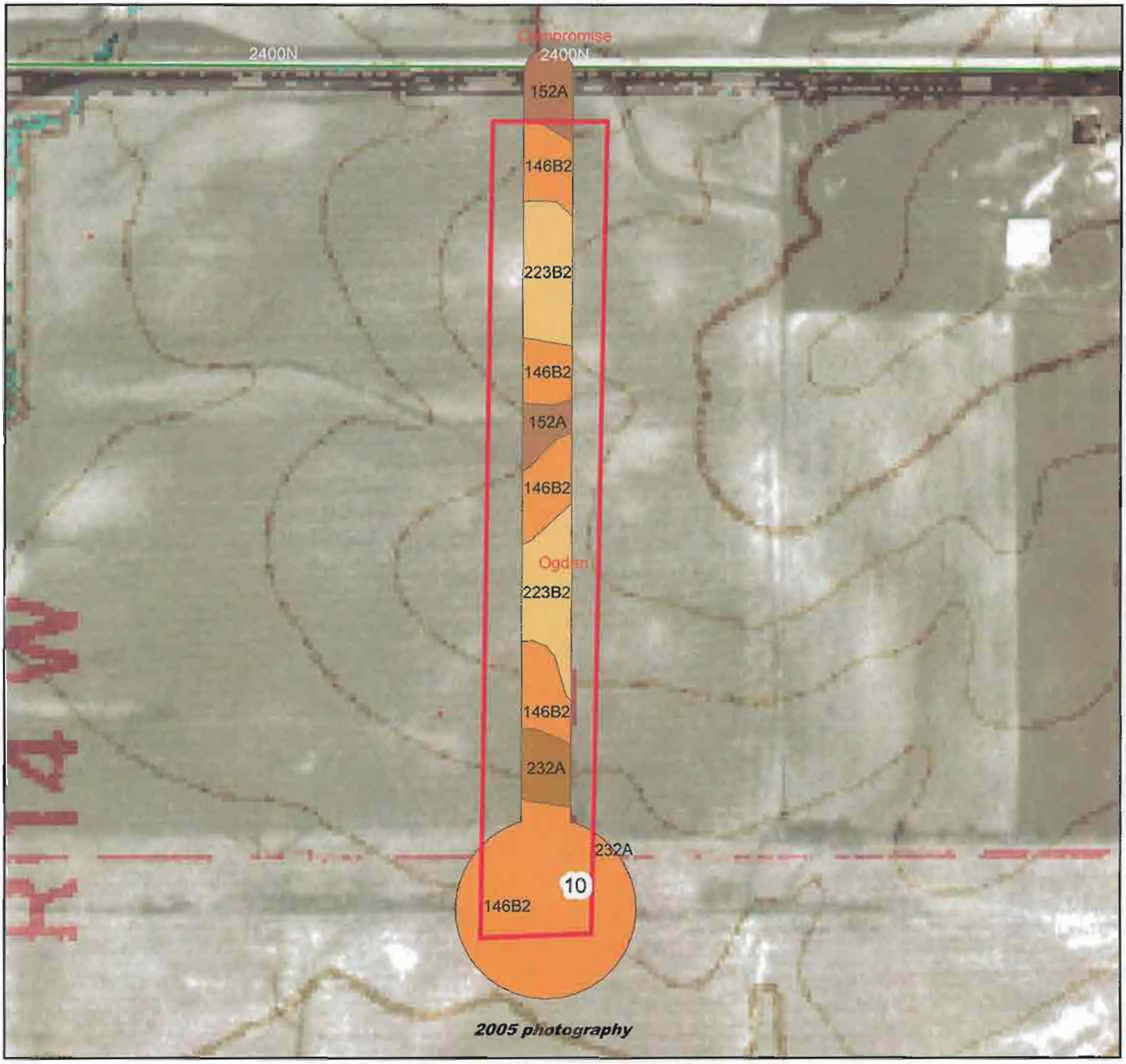
The 223B2 (Varna Silt Loam) soil has 2-4% slopes that could be an issue with water flowing over the access road possibly causing erosion of the road surface or depositing silt on the access road.

The area most susceptible is outlined in a red rectangle.

Site Limitations:

No significant limitations at this site and associated access road.

California Ridge Wind Farm
Turbine #10



Turbine # 10

Invenergy Construction-Areas-Buffer-Zone Soils Map Data

Soil Map Unit	Name	Slope %	Water Table (feet) / Months	
146B2	Elliott silty clay loam	2-4	1-2	Jan-May
152A	Drummer silty clay loam	0-2	Surface-1	Jan-May
223B2	Varna Silty Clay loam	2-4	2-3.5	Feb-April
232A	Ashkum silty clay loam	0-2	Surface-1	Jan-May

Soil Map Unit	Drainage Class	Erosion Hazard	Hydric Soils	
146B2	Somewhat poorly drained	slight	No	
152A	Poorly drained	slight	Yes	
223B2	Moderately well drained	moderate	No	
232A	Poorly drained	slight	Yes	

0

Soil Map Unit	Concrete Corrosion	Steel Corrosion	
146B2	Low	High	
152A	Low	High	
223B2	Moderate	High	
232A	Low	High	

0

Soil Map Unit	Local Roads / Streets	Shallow Excavations
146B2	Very limited (1,2,3,4)	Very limited (4,5,6)
152A	Very limited (1,2,3,4,7)	Very limited (4,5,7)
223B2	Very limited (1,2,3)	Somewhat limited (4,5,6)
232A	Very limited (1,2,3,4,7)	Very limited (4,5,7)

0

1) Low strength
2) Shrink-swell
3) Frost action
4) Depth to saturated zone
5) Cutbanks cave
6) Dense layer
7) Ponding
8) Slope
9) Wetness

California Ridge Wind Farm
Turbine #11

Soils Present:

146B2
152A
232A

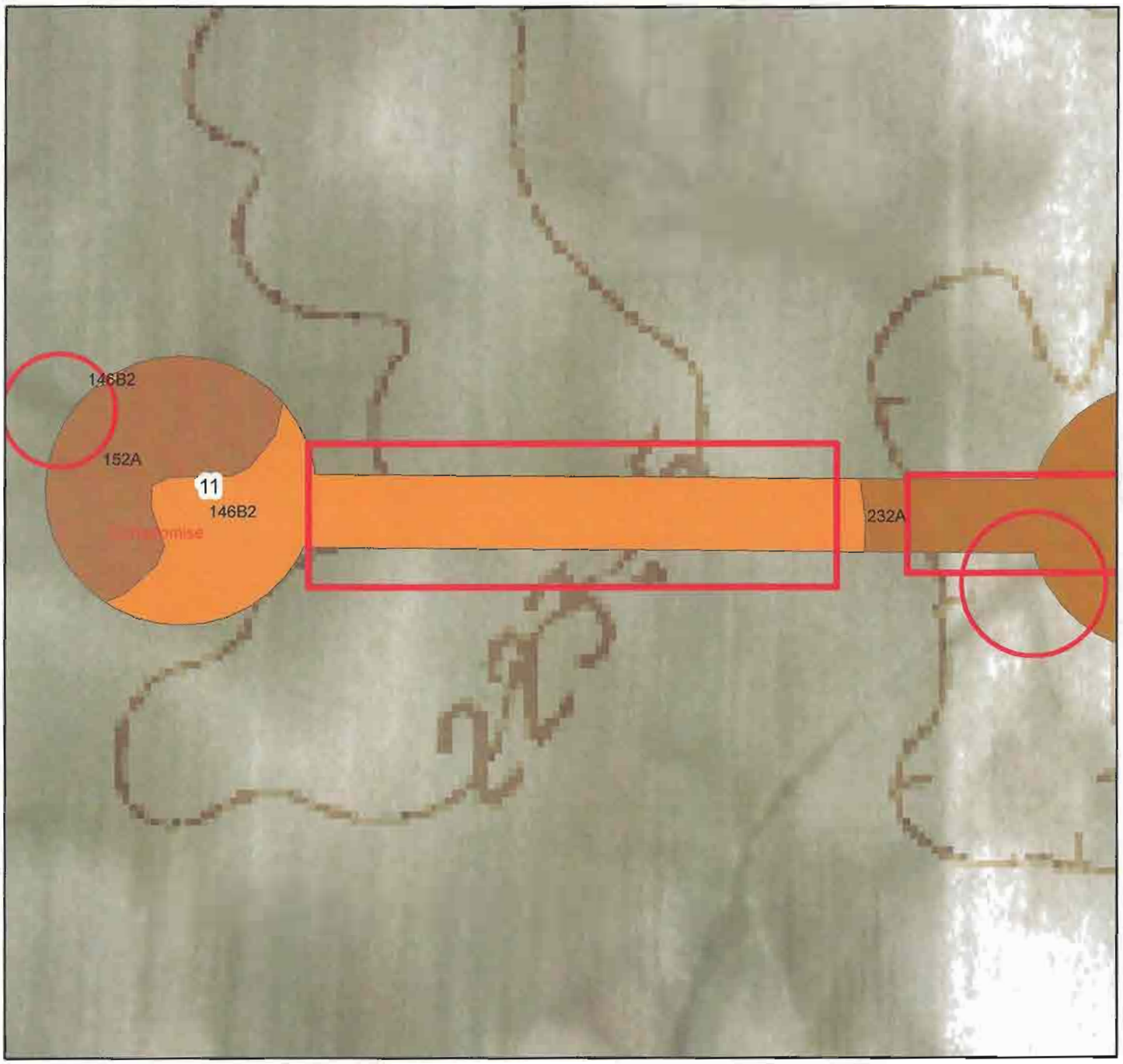
Soil Limitations:

The 146B2 (Elliott Silty Clay Loam) soil has a 2-4% slope that could be an issue with water flowing over the access road and turbine parking area possibly causing erosion of the road surface or depositing silt on them. The area most susceptible is outlined in a red rectangle.

Site Limitations:

The site has one possible concentrated flow area that begins to form at the northwest corner of the turbine area and flows away from the site. The gravel turbine parking area runoff may exacerbate this flow.

California Ridge Wind Farm
Turbine #11



2005 photography

Turbine # 11

Invenergy Construction-Areas-Buffer-Zone Soils Map Data

Soil Map Unit	Name	Slope %	Water Table (feet) / Months	
146B2	Elliott silty clay loam	2-4	1-2	Jan-May
152A	Drummer silty clay loam	0-2	Surface-1	Jan-May
232A	Ashkum silty clay loam	0-2	Surface-1	Jan-May

Soil Map Unit	Drainage Class	Erosion Hazard	Hydric Soils	
146B2	Somewhat poorly drained	slight	No	
152A	Poorly drained	slight	Yes	
232A	Moderately well drained	moderate	No	

0

0

Soil Map Unit	Concrete Corrosion	Steel Corrosion	
146B2	Low	High	
152A	Low	High	
232A	Moderate	High	

0

0

Soil Map Unit	Local Roads / Streets	Shallow Excavations
146B2	Very limited (1,2,3,4)	Very limited (4,5,6)
152A	Very limited (1,2,3,4,7)	Very limited (4,5,7)
232A	Very limited (1,2,3)	Somewhat limited (4,5,6)

0

0

1) Low strength
2) Shrink-swell
3) Frost action
4) Depth to saturated zone
5) Cutbanks cave
6) Dense layer
7) Ponding
8) Slope
9) Wetness

California Ridge Wind Farm
Turbine #12

Soils Present:

232A
663B

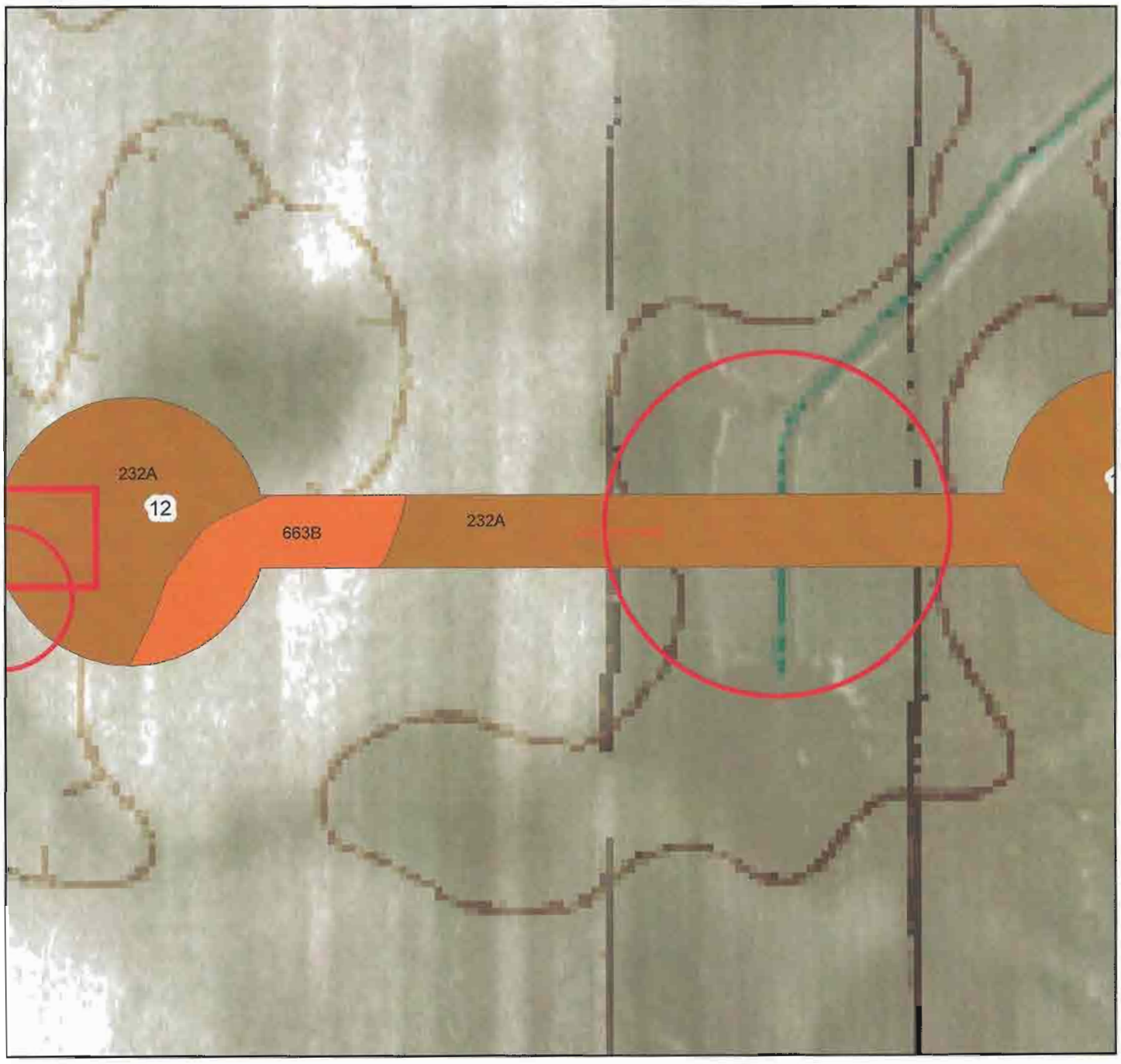
Soil Limitations:

The site has some 663B (Clair) that has a 2-5% slope characteristic that could have an erosion issue, but the short length of the slope should minimize any issues.

Site Limitations:

The access road has one site (see photo) where concentrated flow crosses the road that will need increased protection to keep it from washing away when water flows over it. It is marked with a red circle with the concentrated flow area a blue/green line.

California Ridge Wind Farm
Turbine #12



2005 photography

Turbine # 12

Invenergy Construction-Areas-Buffer-Zone Soils Map Data

Soil Map Unit	Name	Slope %	Water Table (feet) / Months	
232A	Ashkum silty clay loam	0-2	Surface-1	Jan-May
663B	Claire Silt Loam	2-5	2-3.5	Feb-April

Soil Map Unit	Drainage Class	Erosion Hazard	Hydric Soils	
232A	Moderately well drained	moderate	No	
663B	Moderately well drained	slight	No	
	0			
	0			
	0			

Soil Map Unit	Concrete Corrosion	Steel Corrosion	
232A	Moderate	High	
663B	Moderate	Moderate	
	0		
	0		
	0		

Soil Map Unit	Local Roads / Streets	Shallow Excavations
232A	Very limited (1,2,3)	Somewhat limited (4,5,6)
663B	Very Limited (1,3)	Very Limited (5,9)
	0	
	0	
	0	

1) Low strength
2) Shrink-swell
3) Frost action
4) Depth to saturated zone
5) Cutbanks cave
6) Dense layer
7) Ponding
8) Slope
9) Wetness

California Ridge Wind Farm

Turbine #13

Soils Present:

146B2

232A

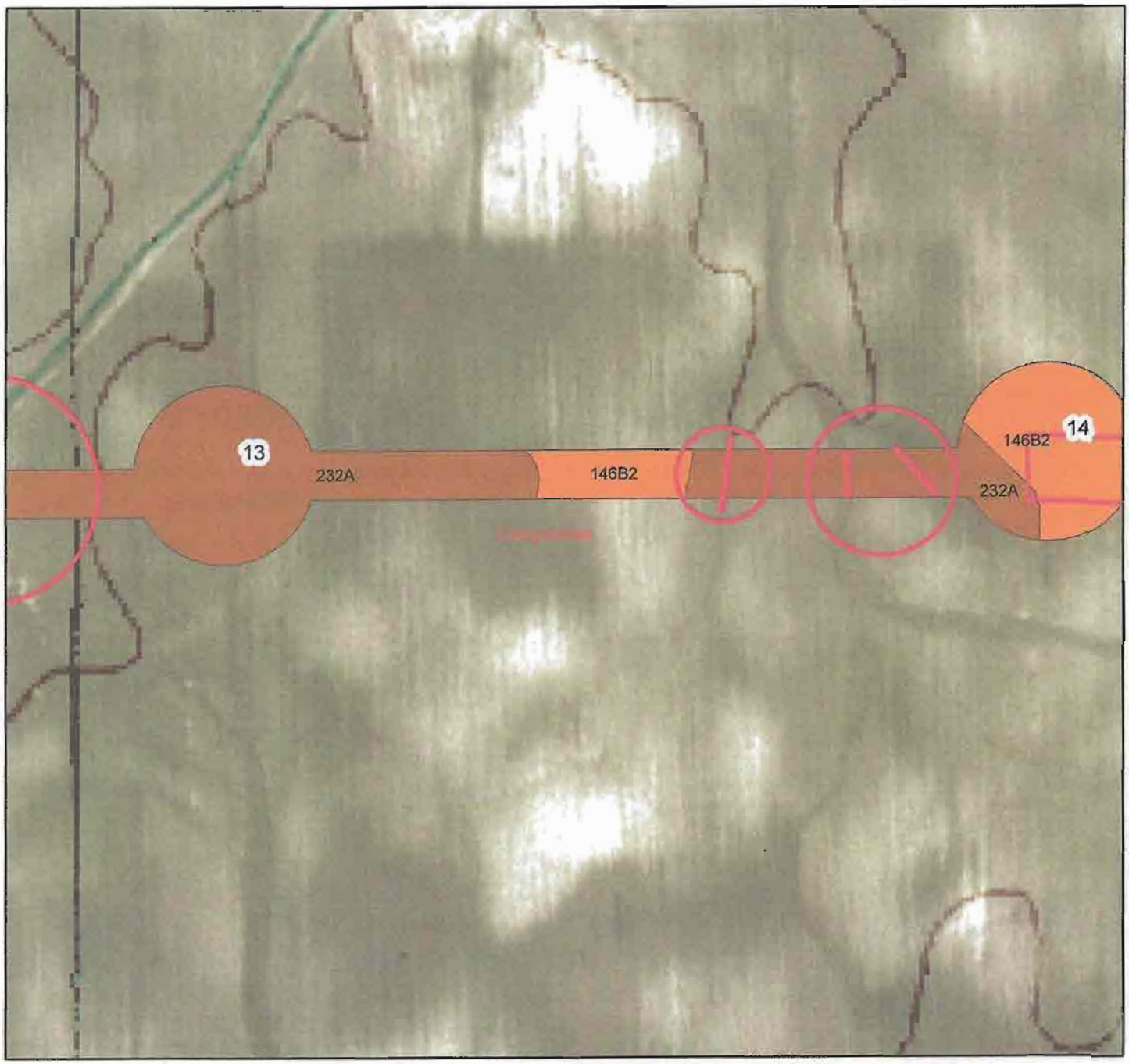
Soil Limitations:

The 146B2 (Elliott Silty Clay Loam) soil has a 2-4% slope that could be an issue with water flowing over the access road possibly causing erosion of the road surface or depositing silt on the access road. This is only a minor concern at this site because the area of this soil type is short.

Site Limitations:

The access road has three sites (see photo) where concentrated flow crosses the road that will need increased protection to keep it from washing away when water flows over it. It is marked with a red circle with the concentrated flow area a solid red line.

California Ridge Wind Farm
Turbine #13



2005 photography

Turbine # 13

Invenergy Construction-Areas-Buffer-Zone Soils Map Data

Soil Map Unit	Name	Slope %	Water Table (feet) / Months	
146B2	Elliott silty clay loam	2-4	1-2	Jan-May
232A	Ashkum silty clay loam	0-2	Surface-1	Jan-May

Soil Map Unit	Drainage Class	Erosion Hazard	Hydric Soils	
146B2	Somewhat poorly drained	slight	No	
232A	Poorly drained	slight	Yes	
	0			
	0			
	0			

Soil Map Unit	Concrete Corrosion	Steel Corrosion	
146B2	Low	High	
232A	Low	High	
	0		
	0		
	0		

Soil Map Unit	Local Roads / Streets	Shallow Excavations
146B2	Very limited (1,2,3,4)	Very limited (4,5,6)
232A	Very limited (1,2,3,4,7)	Very limited (4,5,7)
	0	
	0	
	0	

1) Low strength
2) Shrink-swell
3) Frost action
4) Depth to saturated zone
5) Cutbanks cave
6) Dense layer
7) Ponding
8) Slope
9) Wetness

California Ridge Wind Farm
Turbine #14

Soils Present:

146B2

232A

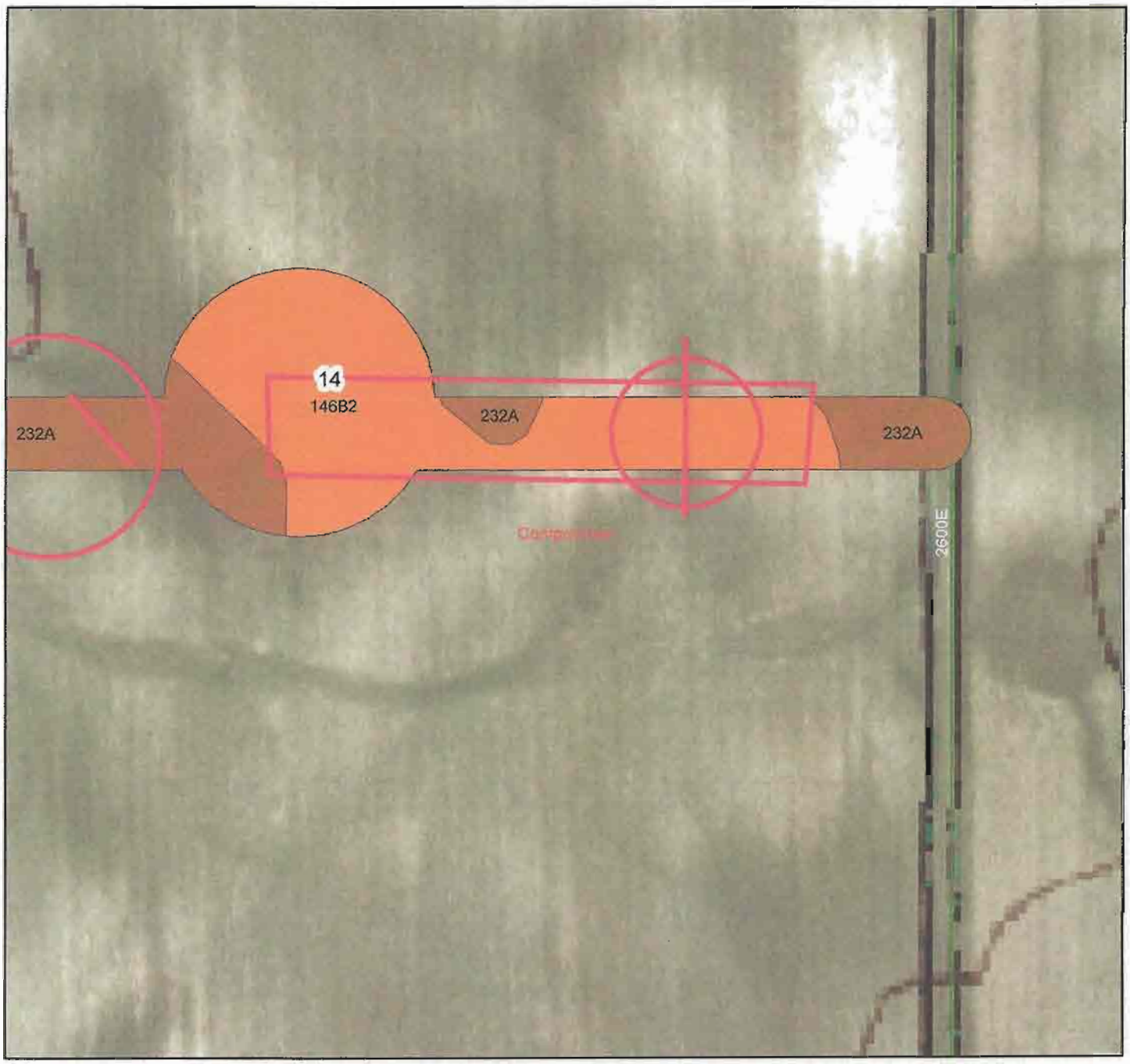
Soil Limitations:

The 146B2 (Elliott Silty Clay Loam) soil has a 2-4% slope that could be an issue with water flowing over the access road possibly causing erosion of the road surface or depositing silt on the access road. The area most susceptible is outlined in a red rectangle.

Site Limitations:

The access road has one site (see photo) where concentrated flow crosses the road that will need increased protection to keep it from washing away when water flows over it. It is marked with a red circle with the concentrated flow area a solid red line.

California Ridge Wind Farm
Turbine #14



2005 photography

Turbine # 14

Invenergy Construction-Areas-Buffer-Zone Soils Map Data

Soil Map Unit	Name	Slope %	Water Table (feet) / Months	
146B2	Elliott silty clay loam	2-4	1-2	Jan-May
232A	Ashkum silty clay loam	0-2	Surface-1	Jan-May

Soil Map Unit	Drainage Class	Erosion Hazard	Hydric Soils	
146B2	Somewhat poorly drained	slight	No	
232A	Poorly drained	slight	Yes	
	0			
	0			
	0			

Soil Map Unit	Concrete Corrosion	Steel Corrosion	
146B2	Low	High	
232A	Low	High	
	0		
	0		
	0		

Soil Map Unit	Local Roads / Streets	Shallow Excavations
146B2	Very limited (1,2,3,4)	Very limited (4,5,6)
232A	Very limited (1,2,3,4,7)	Very limited (4,5,7)
	0	
	0	
	0	

1) Low strength
2) Shrink-swell
3) Frost action
4) Depth to saturated zone
5) Cutbanks cave
6) Dense layer
7) Ponding
8) Slope
9) Wetness

California Ridge Wind Farm
Turbine #15

Soils Present:

223B2

232A

Soil Limitations:

The 223B2 (Varna Silt Loam) soil has 2-4% slopes that could be an issue with water flowing over the access road possibly causing erosion of the road surface or depositing silt on the access road and turbine parking area. The area most susceptible is outlined in red rectangles.

Site Limitations:

The access road has one site (see photo) where concentrated flow crosses the road that will need increased protection to keep it from washing away when water flows over it. It is marked with a red circle with the concentrated flow area a solid red line.

California Ridge Wind Farm
Turbine #15

2005 photography

Turbine # 15

Invenergy Construction-Areas-Buffer-Zone Soils Map Data

Soil Map Unit	Name	Slope %	Water Table (feet) / Months	
223B2	Varna Silty Clay loam	2-4	2-3.5	Feb-April
232A	Ashkum silty clay loam	0-2	Surface-1	Jan-May

Soil Map Unit	Drainage Class	Erosion Hazard	Hydric Soils	
223B2	Moderately well drained	moderate	No	
232A	Poorly drained	slight	Yes	
	0			
	0			
	0			

Soil Map Unit	Concrete Corrosion	Steel Corrosion	
223B2	Moderate	High	
232A	Low	High	
	0		
	0		
	0		

Soil Map Unit	Local Roads / Streets	Shallow Excavations
223B2	Very limited (1,2,3)	Somewhat limited (4,5,6)
232A	Very limited (1,2,3,4,7)	Very limited (4,5,7)
	0	
	0	
	0	

1) Low strength
2) Shrink-swell
3) Frost action
4) Depth to saturated zone
5) Cutbanks cave
6) Dense layer
7) Ponding
8) Slope
9) Wetness

California Ridge Wind Farm
Turbine #16

Soils Present:

146B2
223B2
232A
663B

Soil Limitations:

The 146B2 (Elliott Silty Clay Loam) soil has a 2-4% slope that could be an issue with water flowing over the access road possibly causing erosion of the road surface or depositing silt on the access road.

The 223B2 (Varna Silt Loam) soil has 2-4% slopes that could be an issue with water flowing over the access road possibly causing erosion of the road surface or depositing silt on the access road and turbine parking area.

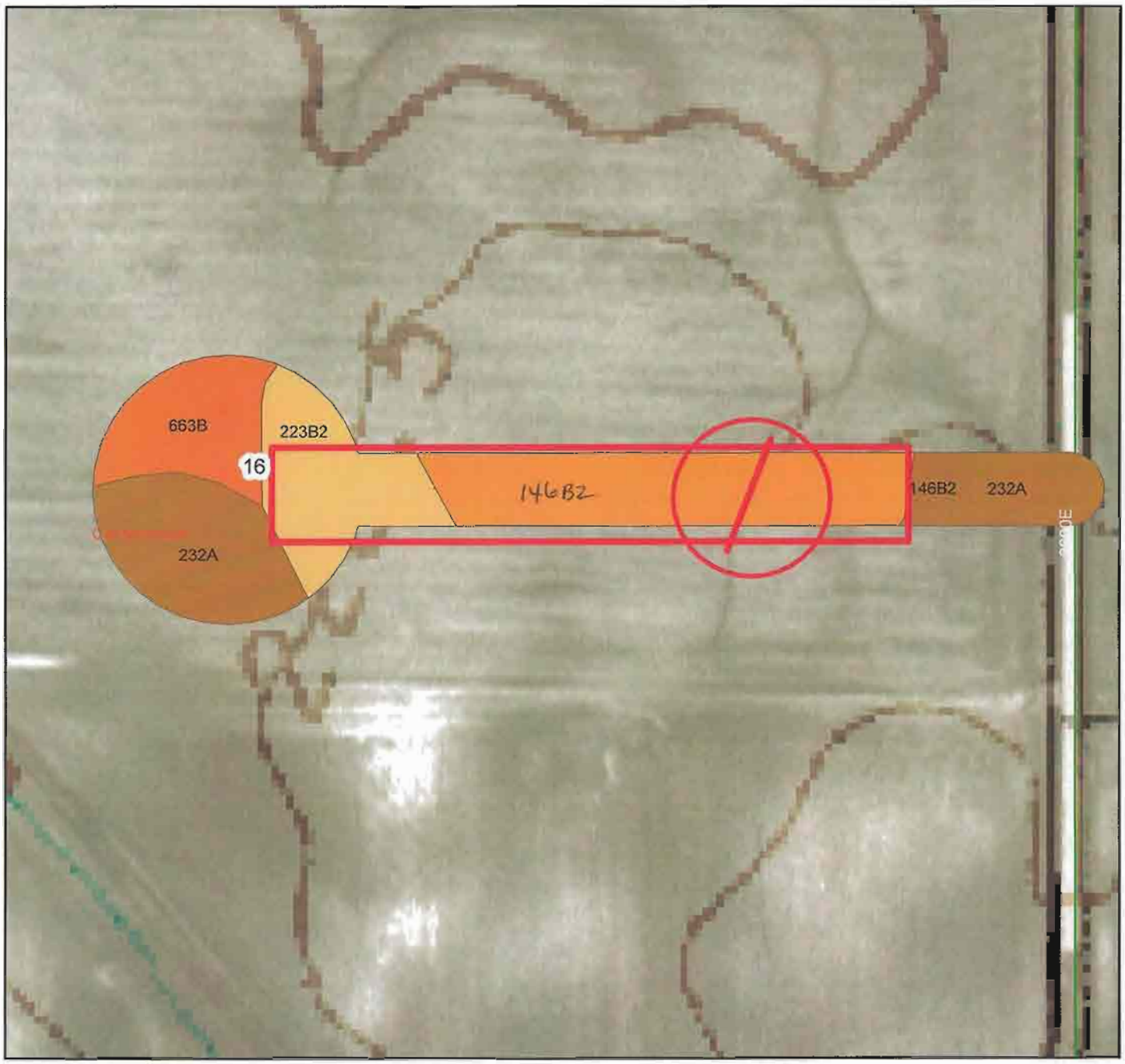
There is some 663B (Clair) soil that has 2-5% slopes that may also be an issue, but it starts and the edge of the site and slopes away from the turbine.

The area most susceptible is outlined in a red rectangle.

Site Limitations:

There is one concentrated flow site at this location that is marked with a red circle and the flow area with a red line.

California Ridge Wind Farm
Turbine #16



2005 photography

Turbine # 16

Invenergy Construction-Areas-Buffer-Zone Soils Map Data

Soil Map Unit	Name	Slope %	Water Table (feet) / Months	
146B2	Elliott silty clay loam	2-4	1-2	Jan-May
232A	Varna Silty Clay loam	4-6	2-3.5	Feb-April
663B	Claire Silt Loam	2-5	2-3.5	Feb-April

Soil Map Unit	Drainage Class	Erosion Hazard	Hydric Soils	
146B2	Somewhat poorly drained	slight	No	
232A	Moderately well drained	moderate	No	
663B	Moderately well drained	slight	No	

0
0

Soil Map Unit	Concrete Corrosion	Steel Corrosion	
146B2	Low	High	
232A	Moderate	High	
663B	Moderate	Moderate	

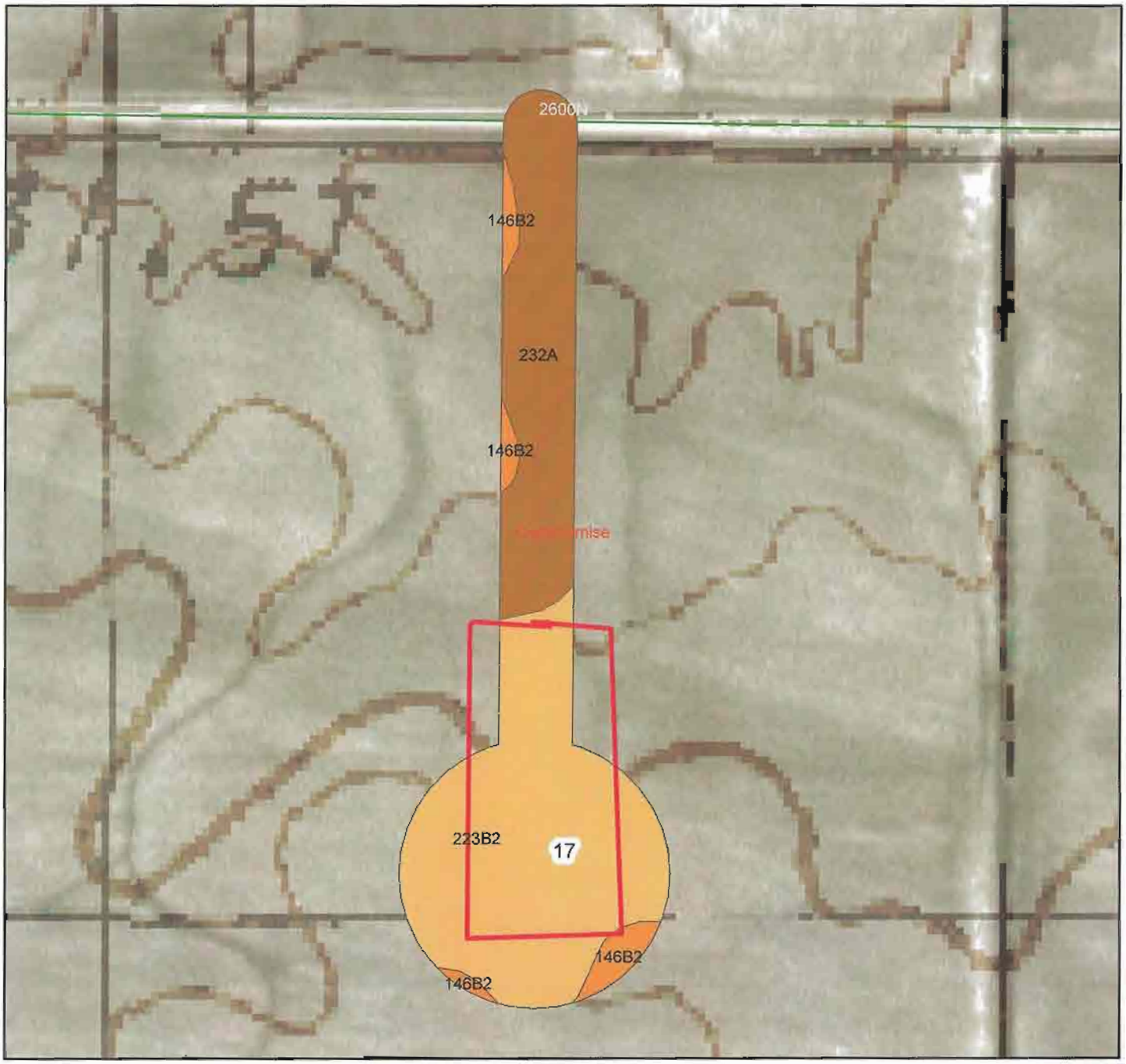
0
0

Soil Map Unit	Local Roads / Streets	Shallow Excavations
146B2	Very limited (1,2,3,4)	Very limited (4,5,6)
232A	Very limited (1,2,3)	Very Limited (9)
663B	Very Limited (1,3)	Very Limited (5,9)

0
0

1) Low strength
2) Shrink-swell
3) Frost action
4) Depth to saturated zone
5) Cutbanks cave
6) Dense layer
7) Ponding
8) Slope
9) Wetness

California Ridge Wind Farm
Turbine #17



2005 photography

Turbine # 17

Invenergy Construction-Areas-Buffer-Zone Soils Map Data

Soil Map Unit	Name	Slope %	Water Table (feet) / Months	
146B2	Elliott silty clay loam	2-4	1-2	Jan-May
223B2	Varna Silty Clay loam	2-4	2-3.5	Feb-April
232A	Varna Silty Clay loam	4-6	2-3.5	Feb-April

Soil Map Unit	Drainage Class	Erosion Hazard	Hydric Soils	
146B2	Somewhat poorly drained	slight	No	
223B2	Moderately well drained	moderate	No	
232A	Moderately well drained	moderate	No	

0

0

Soil Map Unit	Concrete Corrosion	Steel Corrosion	
146B2	Low	High	
223B2	Moderate	High	
232A	Moderate	High	

0

0

Soil Map Unit	Local Roads / Streets	Shallow Excavations
146B2	Very limited (1,2,3,4)	Very limited (4,5,6)
223B2	Very limited (1,2,3)	Somewhat limited (4,5,6)
232A	Very limited (1,2,3)	Very Limited (9)

0

0

1) Low strength
2) Shrink-swell
3) Frost action
4) Depth to saturated zone
5) Cutbanks cave
6) Dense layer
7) Ponding
8) Slope
9) Wetness

California Ridge Wind Farm
Turbine #18

Soils Present:

152A

481A

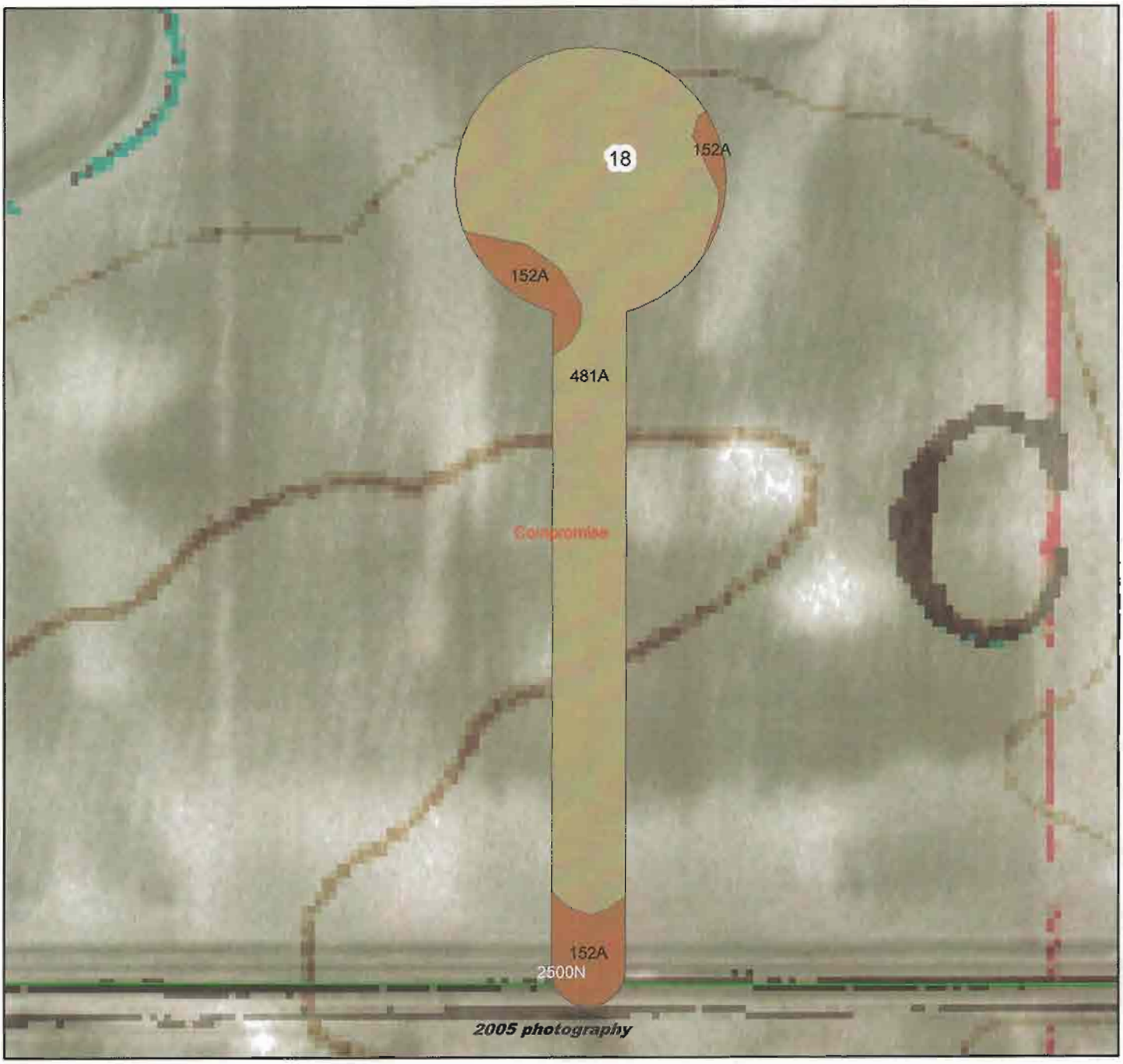
Soil Limitations:

There are no significant soil limitations at this site.

Site Limitations:

There are no significant site limitations at this site.

California Ridge Wind Farm
Turbine #18



Turbine # 18

Invenergy Construction-Areas-Buffer-Zone Soils Map Data

Soil Map Unit	Name	Slope %	Water Table (feet) / Months	
152A	Drummer silty clay loam	0-2	Surface-1	Jan-May
481A	Raub Silt Loam	0-2	1-2	Jan-May

Soil Map Unit	Drainage Class	Erosion Hazard	Hydric Soils	
152A	Poorly drained	slight	Yes	
481A	Somewhat poorly drained	slight	No	
	0			
	0			
	0			

Soil Map Unit	Concrete Corrosion	Steel Corrosion	
152A	Low	High	
481A	Moderate	Moderate	
	0		
	0		
	0		

Soil Map Unit	Local Roads / Streets	Shallow Excavations
152A	Very limited (1,2,3,4,7)	Very limited (4,5,7)
481A	Very Limited (9)	Very Limited (1,3)
	0	
	0	
	0	

1) Low strength
2) Shrink-swell
3) Frost action
4) Depth to saturated zone
5) Cutbanks cave
6) Dense layer
7) Ponding
8) Slope
9) Wetness

California Ridge Wind Farm
Turbine #19

Soils Present:

146B2
152A
223B2
232A

Soil Limitations:

The 146B2 (Elliott Silty Clay Loam) soil has a 2-4% slope that could be an issue with water flowing over the access road possibly causing erosion of the road surface or depositing silt on the access road and turbine parking area.

The 223B2 (Varna Silt Loam) soil has 2-4% slopes that could be an issue with water flowing over the access road possibly causing erosion of the road surface or depositing silt on the access road.

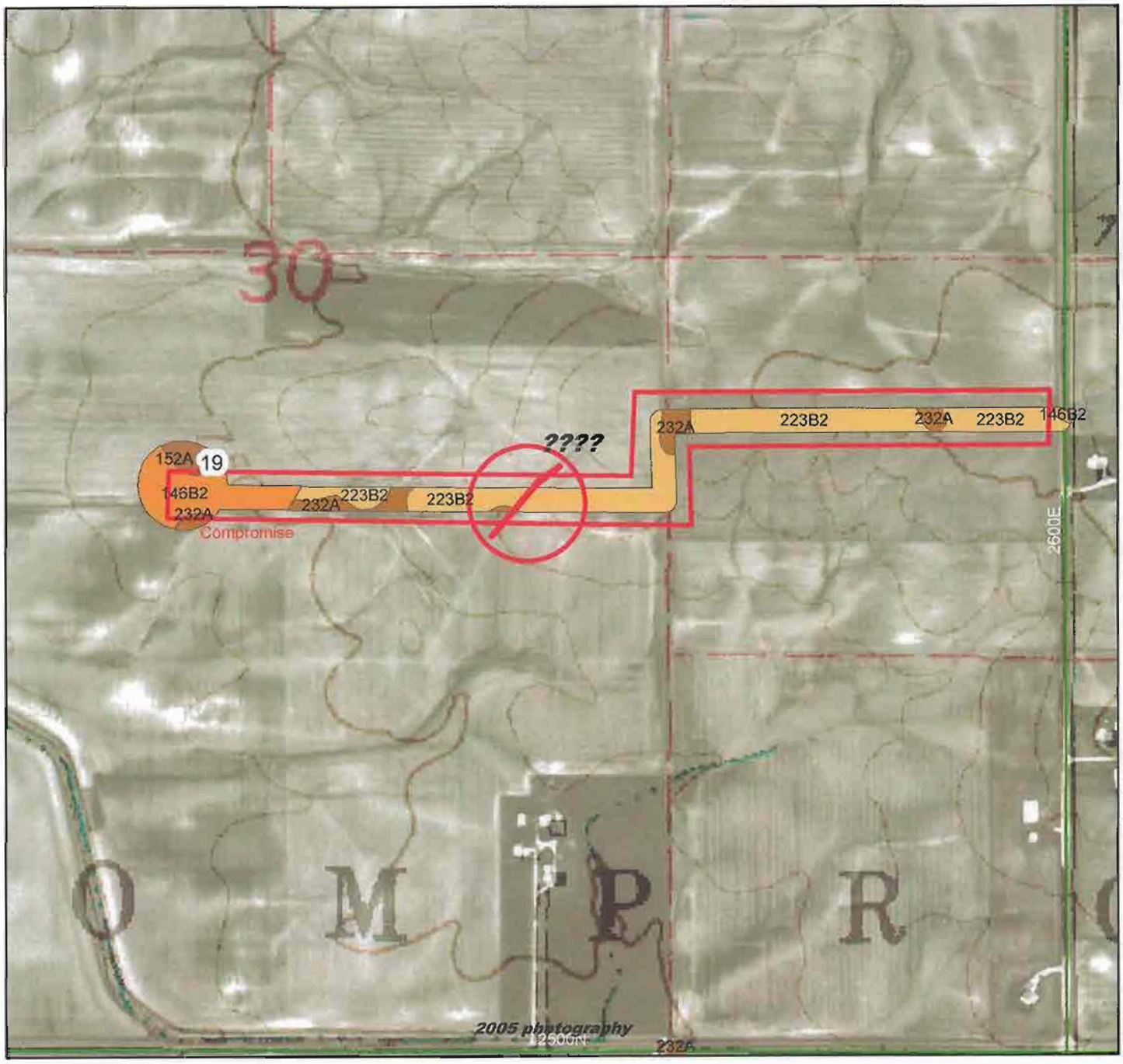
Due to the length of slopes at this site erosion along the edges of the access road some gulley erosion is possible.

The area most susceptible is outlined in a red rectangle.

Site Limitations:

There is a possible concentrated flow area that shows faintly in some of the photography. This may not be enough of an issue that it needs any action. It is marked with a red circle with the concentrated flow area a solid red line.

California Ridge Wind Farm
Turbine #19



Turbine # 19

Invenergy Construction-Areas-Buffer-Zone Soils Map Data

Soil Map Unit	Name	Slope %	Water Table (feet) / Months	
146B2	Elliott silty clay loam	2-4	1-2	Jan-May
223B2	Varna Silty Clay loam	2-4	2-3.5	Feb-April
232A	Varna Silty Clay loam	4-6	2-3.5	Feb-April

Soil Map Unit	Drainage Class	Erosion Hazard	Hydric Soils	
146B2	Somewhat poorly drained	slight	No	
223B2	Moderately well drained	moderate	No	
232A	Moderately well drained	moderate	No	

0
0

Soil Map Unit	Concrete Corrosion	Steel Corrosion	
146B2	Low	High	
223B2	Moderate	High	
232A	Moderate	High	

0
0

Soil Map Unit	Local Roads / Streets	Shallow Excavations
146B2	Very limited (1,2,3,4)	Very limited (4,5,6)
223B2	Very limited (1,2,3)	Somewhat limited (4,5,6)
232A	Very limited (1,2,3)	Very Limited (9)

0
0

1) Low strength
2) Shrink-swell
3) Frost action
4) Depth to saturated zone
5) Cutbanks cave
6) Dense layer
7) Ponding
8) Slope
9) Wetness

California Ridge Wind Farm
Turbine #20

Soils Present:

146B2
223D3
232A

Soil Limitations:

The 146B2 (Elliott Silty Clay Loam) soil has a 2-4% slope that could be an issue with water flowing over the access road possibly causing erosion of the road surface or depositing silt on the access road.

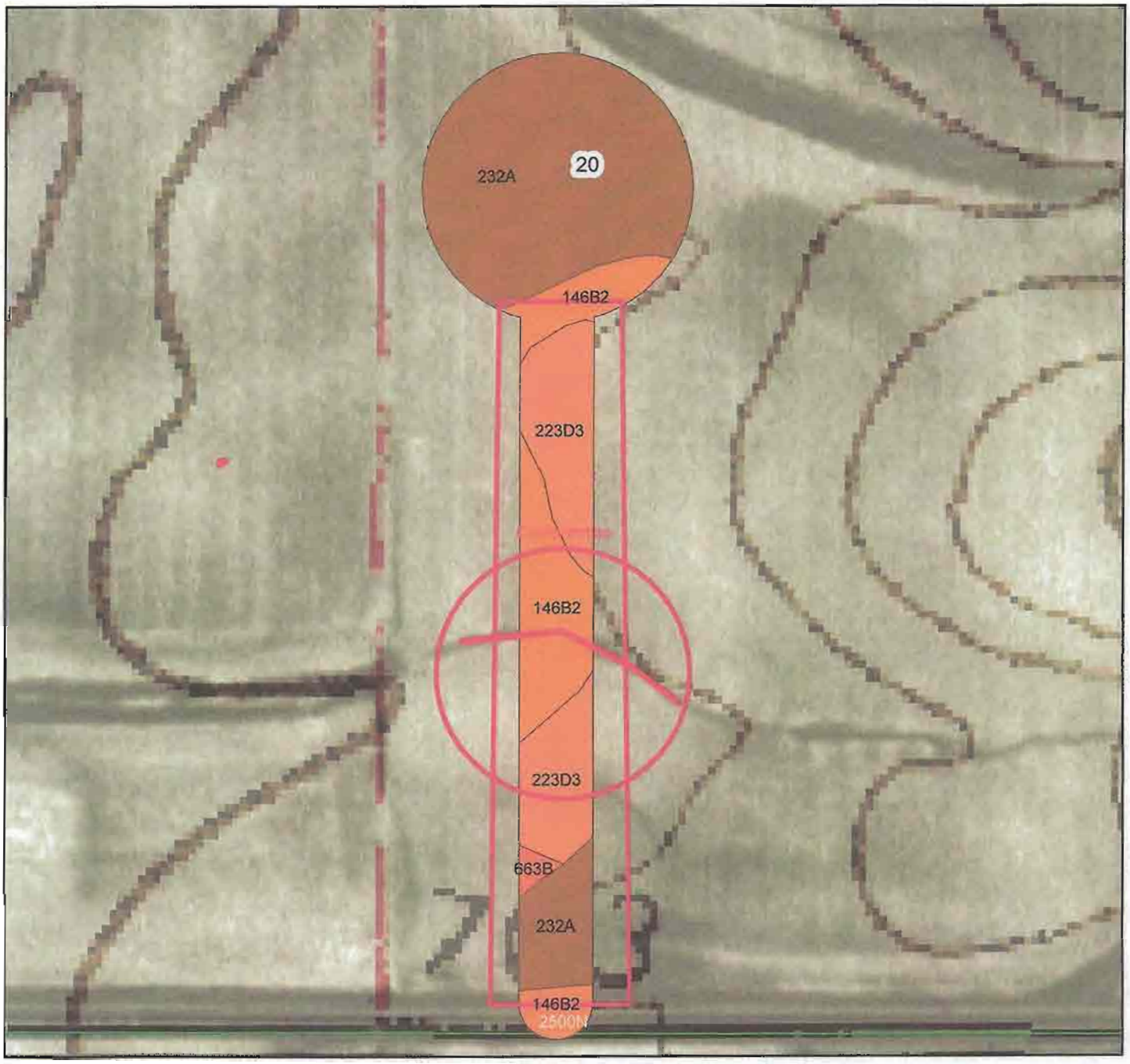
The 223D3 (Varna Silt Loam) soil has significant slopes that could be an issue with water flowing over the access road possibly causing erosion of the road surface or depositing silt on the access road and turbine parking area.

The area most susceptible is outlined in a red rectangle.

Site Limitations:

The access road has one site (see photo) where concentrated flow crosses the road that will need increased protection to keep it from washing away when water flows over it. It is marked with a red circle with the concentrated flow area a solid red line.

California Ridge Wind Farm
Turbine #20



2005 photography

Turbine # 20

Invenergy Construction-Areas-Buffer-Zone Soils Map Data

Soil Map Unit	Name	Slope %	Water Table (feet) / Months	
146B2	Elliott silty clay loam	2-4	1-2	Jan-May
223D3	Varna Silty Clay loam	6-12	2-3.5	Feb-April
232A	Ashkum silty clay loam	0-2	Surface-1	Jan-May
663B	Claire Silt Loam	2-5	2-3.5	Feb-April

Soil Map Unit	Drainage Class	Erosion Hazard	Hydric Soils	
146B2	Somewhat poorly drained	slight	No	
223D3	Moderately well drained	moderate	No	
232A	Poorly drained	slight	Yes	
663B	Moderately well drained	slight	No	

0

Soil Map Unit	Concrete Corrosion	Steel Corrosion	
146B2	Low	High	
223D3	Moderate	High	
232A	Low	High	
663B	Moderate	Moderate	

0

Soil Map Unit	Local Roads / Streets	Shallow Excavations
146B2	Very limited (1,2,3,4)	Very limited (4,5,6)
223D3	Very Limited (1)	Very Limited (9)
232A	Very limited (1,2,3,4,7)	Very limited (4,5,7)
663B	Very Limited (1,3)	Very Limited (5,9)

0

1) Low strength
2) Shrink-swell
3) Frost action
4) Depth to saturated zone
5) Cutbanks cave
6) Dense layer
7) Ponding
8) Slope
9) Wetness

California Ridge Wind Farm
Turbine #21

Soils Present:

91B2
146B2
152A
232A

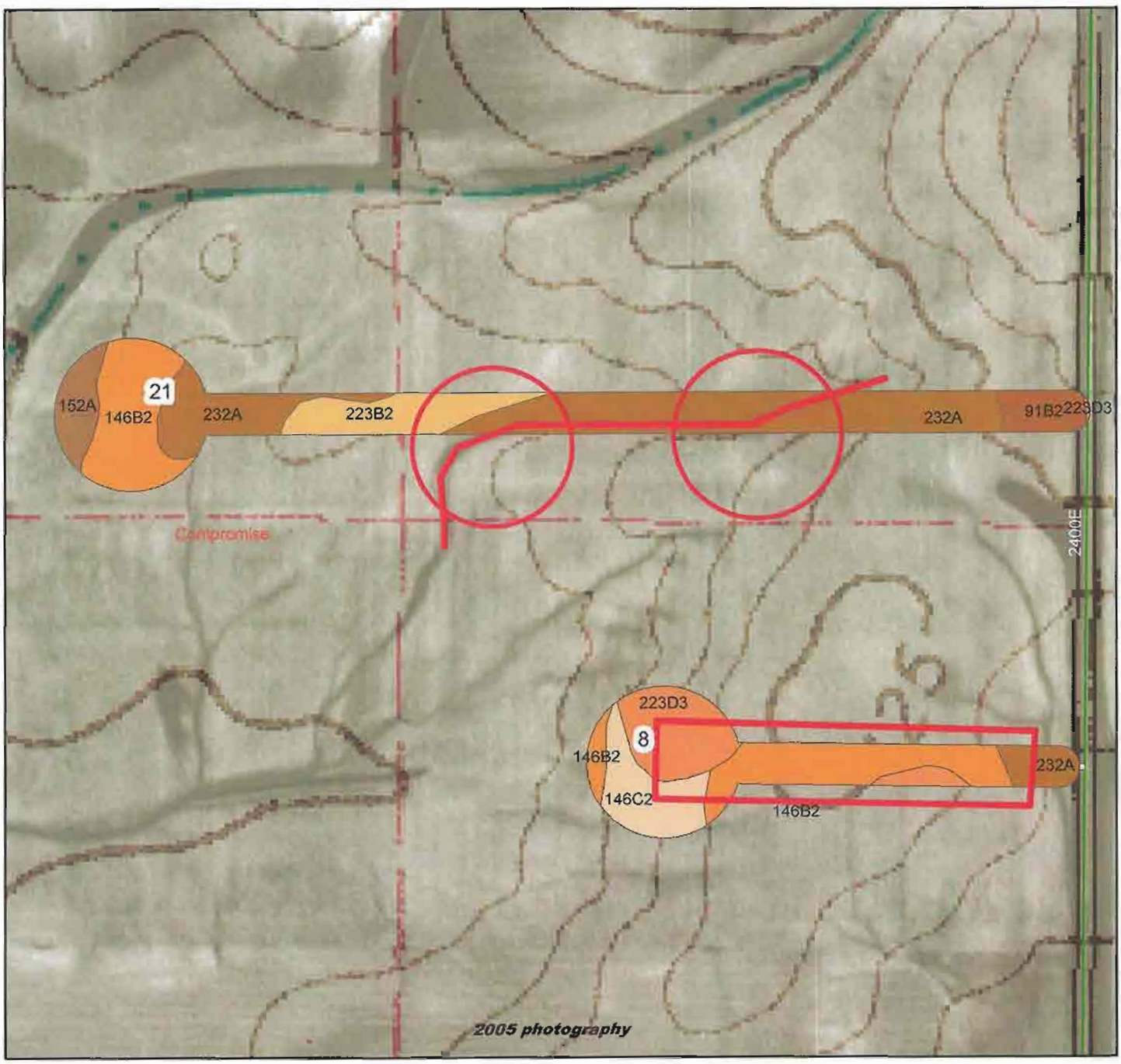
Soil Limitations:

The 146B2 (Elliott Silty Clay Loam) soil has a 2-4% slope that could be an issue with water flowing over the turbine parking area possibly causing erosion of the parking surface or depositing silt on it. This is a small area near the tower that is relatively small and not be an issue.

Site Limitations:

The access road has one site (see photo) where concentrated flow crosses the road that will need increased protection to keep it from washing away when water flows over it. The water flows parallel to the access road and could cause gullying. It is marked with red circles with the concentrated flow area a solid red line.

California Ridge Wind Farm
Turbine #21



Turbine # 21

Invenergy Construction-Areas-Buffer-Zone Soils Map Data

Soil Map Unit	Name	Slope %	Water Table (feet) / Months	
146B2	Elliott silty clay loam	2-4	1-2	Jan-May
223B2	Varna Silty Clay loam	2-4	2-3.5	Feb-April
232A	Varna Silty Clay loam	4-6	2-3.5	Feb-April

Soil Map Unit	Drainage Class	Erosion Hazard	Hydric Soils	
146B2	Somewhat poorly drained	slight	No	
223B2	Moderately well drained	moderate	No	
232A	Moderately well drained	moderate	No	

0

0

Soil Map Unit	Concrete Corrosion	Steel Corrosion	
146B2	Low	High	
223B2	Moderate	High	
232A	Moderate	High	

0

0

Soil Map Unit	Local Roads / Streets	Shallow Excavations
146B2	Very limited (1,2,3,4)	Very lirnited (4,5,6)
223B2	Very limited (1,2,3)	Somewhat limited (4,5,6)
232A	Very limited (1,2,3)	Very Limited (9)

0

0

1) Low strength
2) Shrink-swell
3) Frost action
4) Depth to saturated zone
5) Cutbanks cave
6) Dense layer
7) Ponding
8) Slope
9) Wetness

California Ridge Wind Farm
Turbine #22

Soils Present:

152A
232A
481A

Soil Limitations:

There are no significant soil limitations at this site.

Site Limitations:

There are no significant site limitations at this site.

California Ridge Wind Farm
Turbine #22

Turbine # 22

Invenergy Construction-Areas-Buffer-Zone Soils Map Data

Soil Map Unit	Name	Slope %	Water Table (feet) / Months	
152A	Drummer silty clay loam	0-2	Surface-1	Jan-May
232A	Ashkum silty clay loam	0-2	Surface-1	Jan-May
481A	Raub Silt Loam	0-2	1-2	Jan-May

Soil Map Unit	Drainage Class	Erosion Hazard	Hydric Soils	
152A	Poorly drained	slight	Yes	
232A	Poorly drained	slight	Yes	
481A	Somewhat poorly drained	slight	No	
	0			
	0			

Soil Map Unit	Concrete Corrosion	Steel Corrosion	
152A	Low	High	
232A	Low	High	
481A	Moderate	Moderate	
	0		
	0		

Soil Map Unit	Local Roads / Streets	Shallow Excavations
152A	Very limited (1,2,3,4,7)	Very limited (4,5,7)
232A	Very limited (1,2,3,4,7)	Very limited (4,5,7)
481A	Very Limited (9)	Very Limited (1,3)
	0	
	0	

1) Low strength
2) Shrink-swell
3) Frost action
4) Depth to saturated zone
5) Cutbanks cave
6) Dense layer
7) Ponding
8) Slope
9) Wetness

California Ridge Wind Farm
Turbine #23

Soils Present:

146B2
146C2
232A

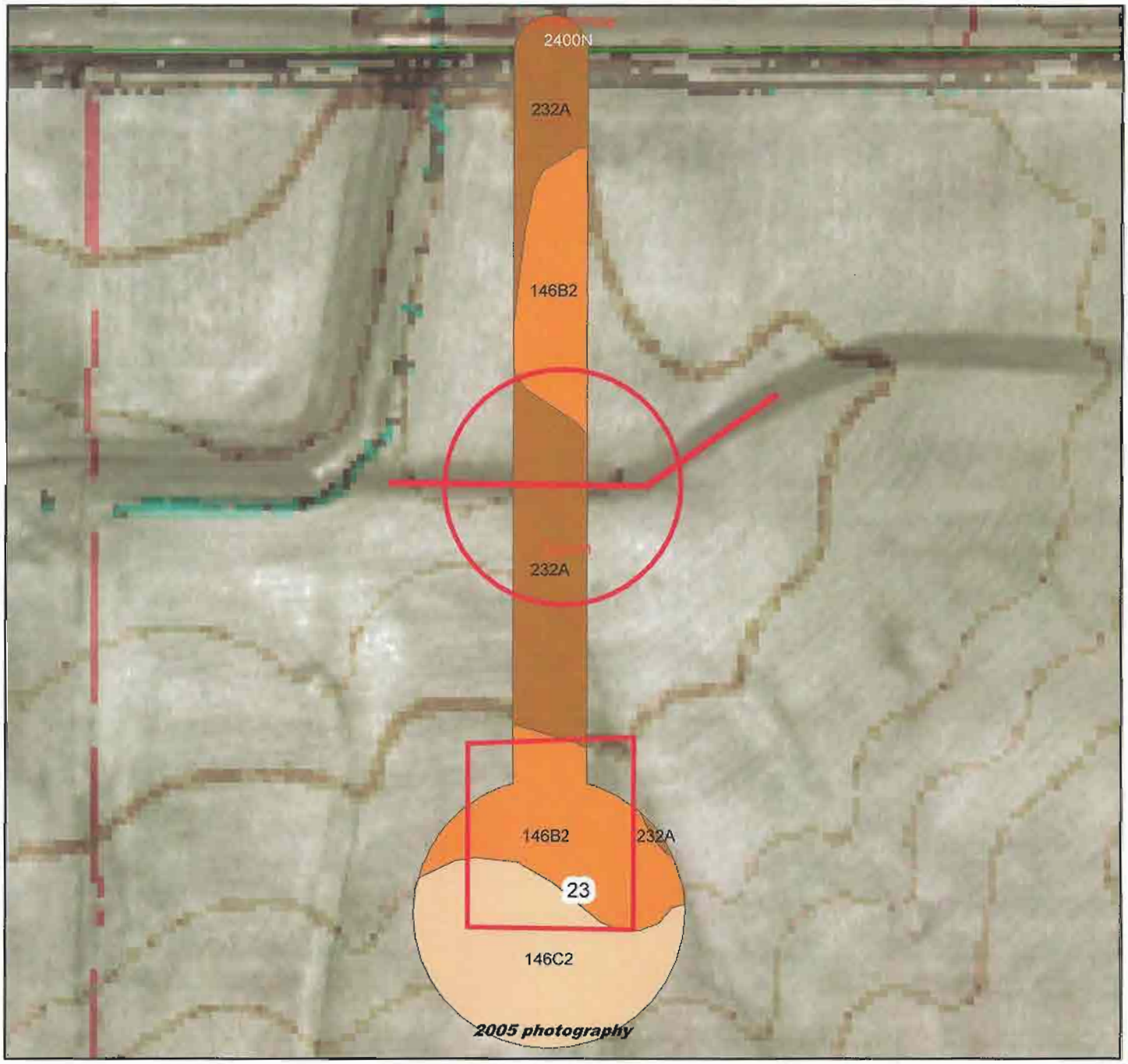
Soil Limitations:

The 146B2 (Elliott Silty Clay Loam) soil has a 2-4% slope and 146C2 has 4-6% slopes that could be an issue with water flowing over the access road possibly causing erosion of the road surface or depositing silt on the access road and turbine parking area. This is a relatively limited area that may not become an issue. The area most susceptible is outlined in a red rectangle.

Site Limitations:

The access road has one site (see photo) where concentrated flow crosses the road that will need increased protection to keep it from washing away when water flows over it. This is a grassed waterway that will have occasionally significant flows of water to contend with.. It is marked with red circles with the waterway a solid red line.

California Ridge Wind Farm
Turbine #23



Turbine # 23

Invenergy Construction-Areas-Buffer-Zone Soils Map Data

Soil Map Unit	Name	Slope %	Water Table (feet) / Months	
146B2	Elliott silty clay loam	2-4	1-2	Jan-May
146C2	Elliott silty clay loam	4-6	1-2	Jan-May
232A	Ashkum silty clay loam	0-2	Surface-1	Jan-May

Soil Map Unit	Drainage Class	Erosion Hazard	Hydric Soils	
146B2	Somewhat poorly drained	slight	No	
146C2	Somewhat poorly drained	slight	No	
232A	Poorly drained	slight	Yes	
	0			
	0			

Soil Map Unit	Concrete Corrosion	Steel Corrosion	
146B2	Low	High	
146C2	Low	High	
232A	Low	High	
	0		
	0		

Soil Map Unit	Local Roads / Streets	Shallow Excavations
146B2	Very limited (1,2,3,4)	Very limited (4,5,6)
146C2	Very limited (1,2,3,4)	Very limited (4,5,6)
232A	Very limited (1,2,3,4,7)	Very limited (4,5,7)
	0	
	0	

1) Low strength
2) Shrink-swell
3) Frost action
4) Depth to saturated zone
5) Cutbanks cave
6) Dense layer
7) Ponding
8) Slope
9) Wetness

California Ridge Wind Farm
Turbine #24

Soils Present:

146B2
223C2
232A

Soil Limitations:

The 146B2 (Elliott Silty Clay Loam) soil has a 2-4% slope that could be an issue with water flowing over the access road possibly causing erosion of the road surface or depositing silt on the access road and the turbine parking area.

The 223C2 (Varna Silt Loam) soil has 4-6% slopes that could be an issue with water flowing over the access road possibly causing erosion of the road surface or depositing silt on the access road and turbine parking area.

The area most susceptible is outlined in a red rectangle. This includes the entire length of the access road.

Site Limitations:

There are no significant site limitations at this site.

California Ridge Wind Farm
Turbine #24

Turbine # 24

Invenergy Construction-Areas-Buffer-Zone Soils Map Data

Soil Map Unit	Name	Slope %	Water Table (feet) / Months	
146B2	Elliott silty clay loam	2-4	1-2	Jan-May
223C2	Varna Silty Clay loam	4-6	2-3.5	Feb-April
232A	Ashkum silty clay loam	0-2	Surface-1	Jan-May

Soil Map Unit	Drainage Class	Erosion Hazard	Hydric Soils	
146B2	Somewhat poorly drained	slight	No	
223C2	Moderately well drained	moderate	No	
232A	Poorly drained	slight	Yes	

0
0

Soil Map Unit	Concrete Corrosion	Steel Corrosion	
146B2	Low	High	
223C2	Moderate	High	
232A	Low	High	

0
0

Soil Map Unit	Local Roads / Streets	Shallow Excavations
146B2	Very limited (1,2,3,4)	Very limited (4,5,6)
223C2	Very limited (1,2,3)	Very Limited (9)
232A	Very limited (1,2,3,4,7)	Very limited (4,5,7)

0
0

1) Low strength
2) Shrink-swell
3) Frost action
4) Depth to saturated zone
5) Cutbanks cave
6) Dense layer
7) Ponding
8) Slope
9) Wetness

California Ridge Wind Farm
Turbine #25

Soils Present:

146B2
232A
91B2

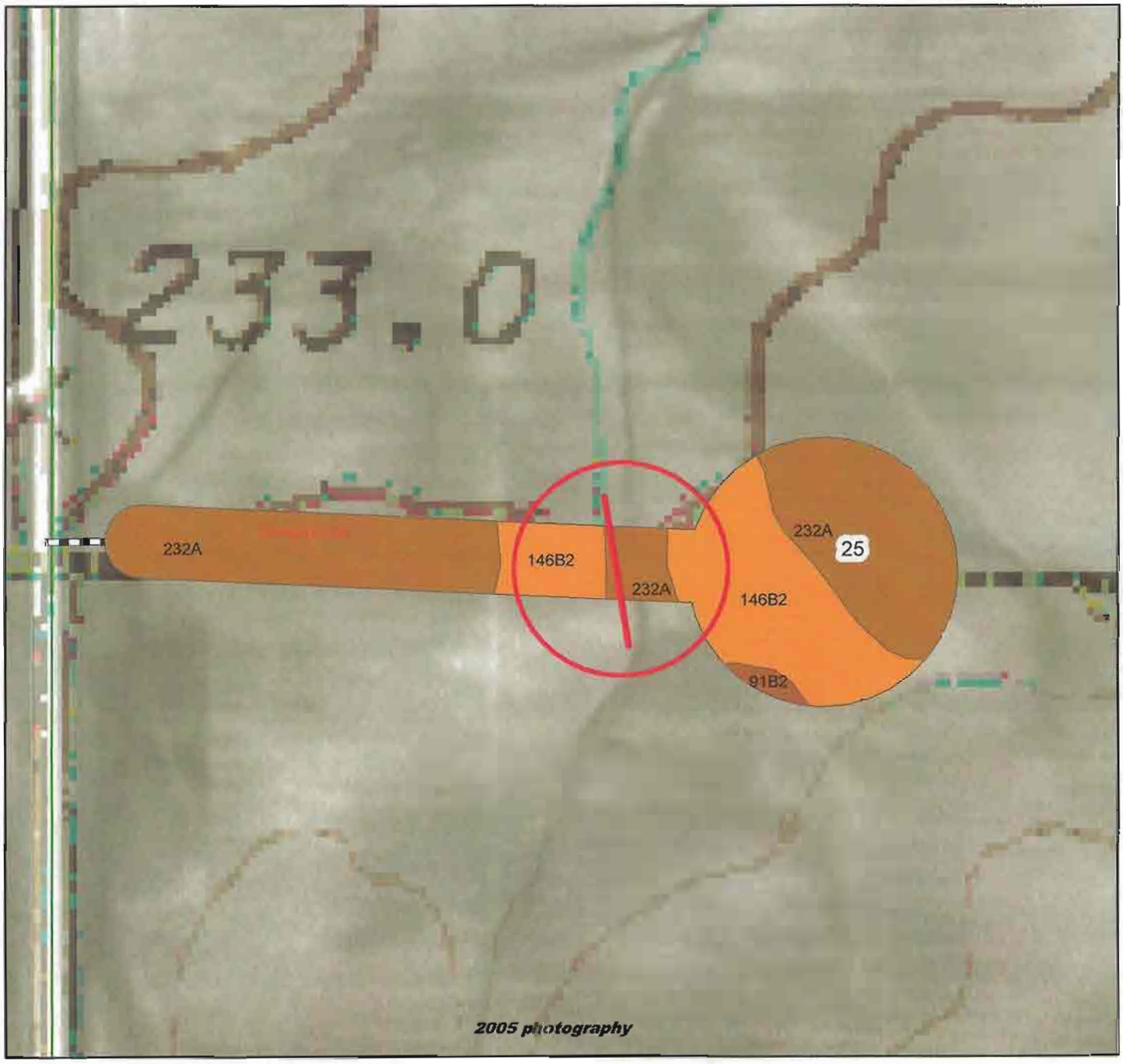
Soil Limitations:

The 146B2 (Elliott Silty Clay Loam) soil has a 2-4% slope that could be an issue with water flowing over the access road possibly causing erosion of the road surface or depositing silt on the access road and turbine parking area. These areas are limited in size and may not develop into a problem.

Site Limitations:

The access road has one site (see photo) where concentrated flow crosses the road that will need increased protection to keep it from washing away when water flows over it. It is marked with red circles with the concentrated flow area a solid red line.

California Ridge Wind Farm
Turbine #25



Turbine # 25

Invenergy Construction-Areas-Buffer-Zone Soils Map Data

Soil Map Unit	Name	Slope %	Water Table (feet) / Months	
146B2	Elliott silty clay loam	2-4	1-2	Jan-May
232A	Ashkum silty clay loam	0-2	Surface-1	Jan-May

Soil Map Unit	Drainage Class	Erosion Hazard	Hydric Soils	
146B2	Somewhat poorly drained	slight	No	
232A	Poorly drained	slight	Yes	
	0			
	0			
	0			

Soil Map Unit	Concrete Corrosion	Steel Corrosion	
146B2	Low	High	
232A	Low	High	
	0		
	0		
	0		

Soil Map Unit	Local Roads / Streets	Shallow Excavations
146B2	Very limited (1,2,3,4)	Very limited (4,5,6)
232A	Very limited (1,2,3,4,7)	Very limited (4,5,7)
	0	
	0	
	0	

1) Low strength
2) Shrink-swell
3) Frost action
4) Depth to saturated zone
5) Cutbanks cave
6) Dense layer
7) Ponding
8) Slope
9) Wetness

California Ridge Wind Farm
Turbine #26

Soils Present:

146B2
223B2
232A

Soil Limitations:

The 146B2 (Elliott Silty Clay Loam) soil has a 2-4% slope that could be an issue with water flowing over the access road possibly causing erosion of the road surface or depositing silt on the access road.

The 223B2 (Varna Silt Loam) soil has 2-4% slopes that could be an issue with water flowing over the access road possibly causing erosion of the road surface or depositing silt on the access road and turbine parking area.

The areas are limited in size and may not become a problem. The areas above the access road to the east are relatively steep and could cause significant runoff.

Site Limitations:

There are no significant site limitations at this site.

California Ridge Wind Farm
Turbine #26

Turbine # 26

Invenergy Construction-Areas-Buffer-Zone Soils Map Data

Soil Map Unit	Name	Slope %	Water Table (feet) / Months	
146B2	Elliott silty clay loam	2-4	1-2	Jan-May
223B2	Varna Silty Clay loam	2-4	2-3.5	Feb-April
223D3	Varna Silty Clay loam	6-12	2-3.5	Feb-April
232A	Ashkum silty clay loam	0-2	Surface-1	Jan-May

Soil Map Unit	Drainage Class	Erosion Hazard	Hydric Soils	
146B2	Somewhat poorly drained	slight	No	
223B2	Moderately well drained	moderate	No	
223D3	Moderately well drained	moderate	No	
232A	Poorly drained	slight	Yes	

0

Soil Map Unit	Concrete Corrosion	Steel Corrosion	
146B2	Low	High	
223B2	Moderate	High	
223D3	Moderate	High	
232A	Low	High	

0

Soil Map Unit	Local Roads / Streets	Shallow Excavations
146B2	Very limited (1,2,3,4)	Very limited (4,5,6)
223B2	Very limited (1,2,3)	Somewhat limited (4,5,6)
223D3	Very Limited (1)	Very Limited (9)
232A	Very limited (1,2,3,4,7)	Very limited (4,5,7)

0

1) Low strength
2) Shrink-swell
3) Frost action
4) Depth to saturated zone
5) Cutbanks cave
6) Dense layer
7) Ponding
8) Slope
9) Wetness

California Ridge Wind Farm
Turbine #27

Soils Present:

146B2
223B2
232A

Soil Limitations:

The 146B2 (Elliott Silty Clay Loam) soil has a 2-4% slope that could be an issue with water flowing over the access road possibly causing erosion of the road surface or depositing silt on the access road.

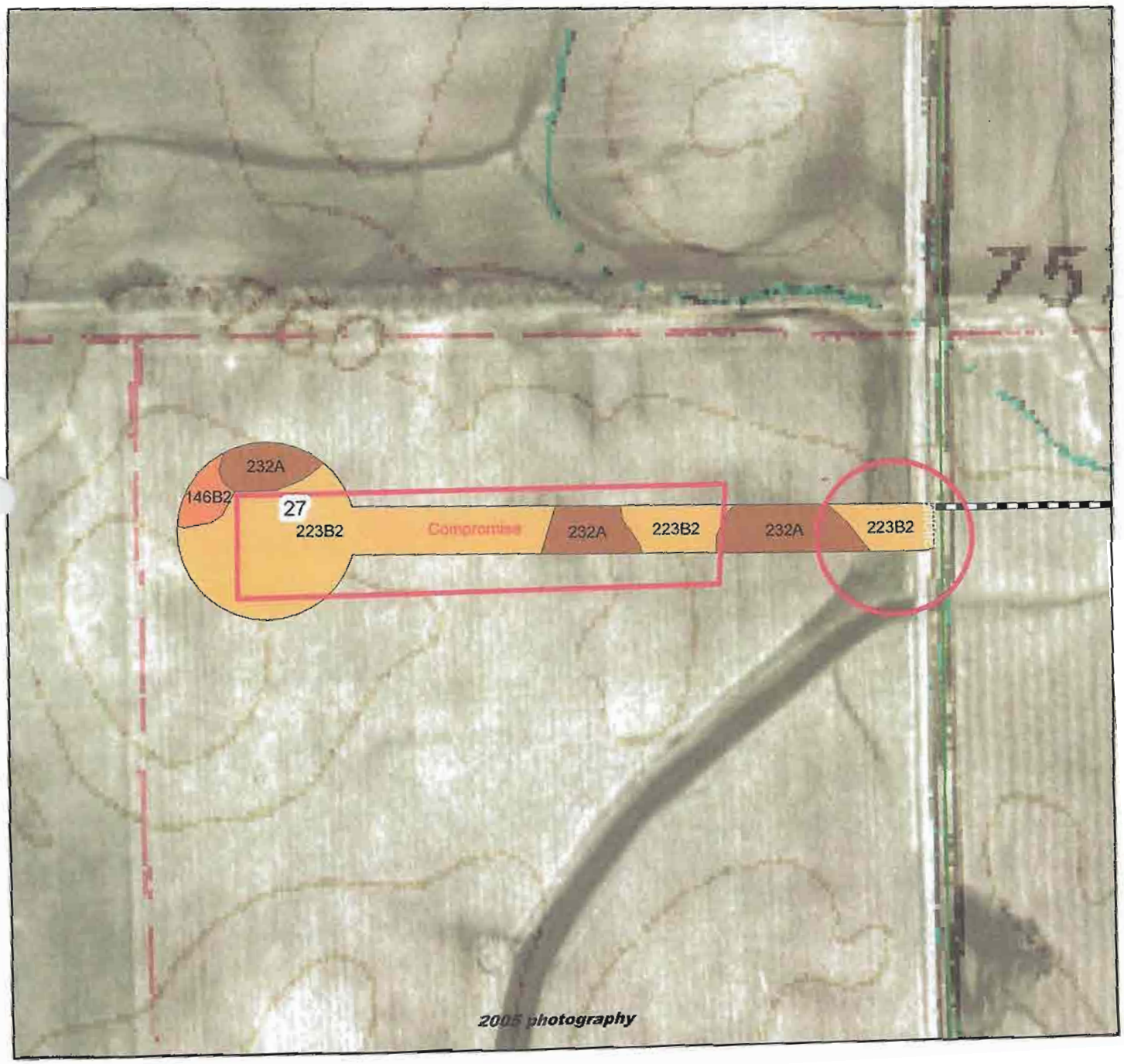
The 223B2 (Varna Silt Loam) soil has 2-4% slopes that could be an issue with water flowing over the access road and turbine parking area possibly causing erosion of the road surface or depositing silt on the access road and turbine parking area.

The area most susceptible is outlined in a red rectangle.

Site Limitations:

The site crosses a CRP Field Border planting that will have to have the contract adjusted so that area is taken out.

California Ridge Wind Farm
Turbine #27



Turbine # 27

Invenergy Construction-Areas-Buffer-Zone Soils Map Data

Soil Map Unit	Name	Slope %	Water Table (feet) / Months	
146B2	Elliott silty clay loam	2-4	1-2	Jan-May
223B2	Varna Silty Clay loam	2-4	2-3.5	Feb-April
232A	Varna Silty Clay loam	4-6	2-3.5	Feb-April

Soil Map Unit	Drainage Class	Erosion Hazard	Hydric Soils	
146B2	Somewhat poorly drained	slight	No	
223B2	Moderately well drained	moderate	No	
232A	Moderately well drained	moderate	No	
	0			
	0			

Soil Map Unit	Concrete Corrosion	Steel Corrosion	
146B2	Low	High	
223B2	Moderate	High	
232A	Moderate	High	
	0		
	0		

Soil Map Unit	Local Roads / Streets	Shallow Excavations
146B2	Very limited (1,2,3,4)	Very limited (4,5,6)
223B2	Very limited (1,2,3)	Somewhat limited (4,5,6)
232A	Very limited (1,2,3)	Very Limited (9)
	0	
	0	

1) Low strength
2) Shrink-swell
3) Frost action
4) Depth to saturated zone
5) Cutbanks cave
6) Dense layer
7) Ponding
8) Slope
9) Wetness

California Ridge Wind Farm
Turbine #28

Soils Present:

146B2
223B2
232A

Soil Limitations:

The 146B2 (Elliott Silty Clay Loam) soil has a 2-4% slope that could be an issue with water flowing over the access road possibly causing erosion of the road surface or depositing silt on the access road.

The 223B2 (Varna Silt Loam) soil has 2-4% slopes that could be an issue with water flowing over the access road possibly causing erosion of the road surface or depositing silt on the access road.

The area most susceptible is outlined in a red rectangle. There are several small areas of these soil types, but they don't look large enough to be significant.

Site Limitations:

There are no significant site limitations on this site.

California Ridge Wind Farm
Turbine #28

Turbine # 28

Invenergy Construction-Areas-Buffer-Zone Soils Map Data

Soil Map Unit	Name	Slope %	Water Table (feet) / Months	
146B2	Elliott silty clay loam	2-4	1-2	Jan-May
223B2	Varna Silty Clay loam	2-4	2-3.5	Feb-April
232A	Varna Silty Clay loam	4-6	2-3.5	Feb-April

Soil Map Unit	Drainage Class	Erosion Hazard	Hydric Soils	
146B2	Somewhat poorly drained	slight	No	
223B2	Moderately well drained	moderate	No	
232A	Moderately well drained	moderate	No	

0
0

Soil Map Unit	Concrete Corrosion	Steel Corrosion	
146B2	Low	High	
223B2	Moderate	High	
232A	Moderate	High	

0
0

Soil Map Unit	Local Roads / Streets	Shallow Excavations
146B2	Very limited (1,2,3,4)	Very limited (4,5,6)
223B2	Very limited (1,2,3)	Somewhat limited (4,5,6)
232A	Very limited (1,2,3)	Very Limited (9)

0
0

1) Low strength
2) Shrink-swell
3) Frost action
4) Depth to saturated zone
5) Cutbanks cave
6) Dense layer
7) Ponding
8) Slope
9) Wetness

California Ridge Wind Farm
Turbine #29

Soils Present:

146B2
223D3
232A

Soil Limitations:

The 146B2 (Elliott Silty Clay Loam) soil has a 2-4% slope that could be an issue with water flowing over the access road possibly causing erosion of the road surface or depositing silt on the access road and near the turbine parking area.

The 223D3 (Varna Silt Loam) soil has significant slopes that could be an issue with water flowing over the access road possibly causing erosion of the road surface or depositing silt on the access road and turbine parking area.

The area most susceptible is outlined in a red rectangle (the whole site in this case).

Site Limitations:

The access road has three sites (see photo) where concentrated flow crosses the road that will need increased protection to keep it from washing away when water flows over it. It is marked with red circles with the concentrated flow area a solid red line.

California Ridge Wind Farm
Turbine #29

Turbine # 29

Invenergy Construction-Areas-Buffer-Zone Soils Map Data

Soil Map Unit	Name	Slope %	Water Table (feet) / Months	
146B2	Elliott silty clay loam	2-4	1-2	Jan-May
223D3	Varna Silty Clay loam	6-12	2-3.5	Feb-April
232A	Ashkum silty clay loam	0-2	Surface-1	Jan-May

Soil Map Unit	Drainage Class	Erosion Hazard	Hydric Soils	
146B2	Somewhat poorly drained	slight	No	
223D3	Moderately well drained	moderate	No	
232A	Poorly drained	slight	Yes	
	0			
	0			

Soil Map Unit	Concrete Corrosion	Steel Corrosion	
146B2	Low	High	
223D3	Moderate	High	
232A	Low	High	
	0		
	0		

Soil Map Unit	Local Roads / Streets	Shallow Excavations
146B2	Very limited (1,2,3,4)	Very limited (4,5,6)
223D3	Very Limited (1)	Very Limited (9)
232A	Very limited (1,2,3,4,7)	Very limited (4,5,7)
	0	
	0	

1) Low strength
2) Shrink-swell
3) Frost action
4) Depth to saturated zone
5) Cutbanks cave
6) Dense layer
7) Ponding
8) Slope
9) Wetness

California Ridge Wind Farm
Turbine #30

Soils Present:

146B2
232A

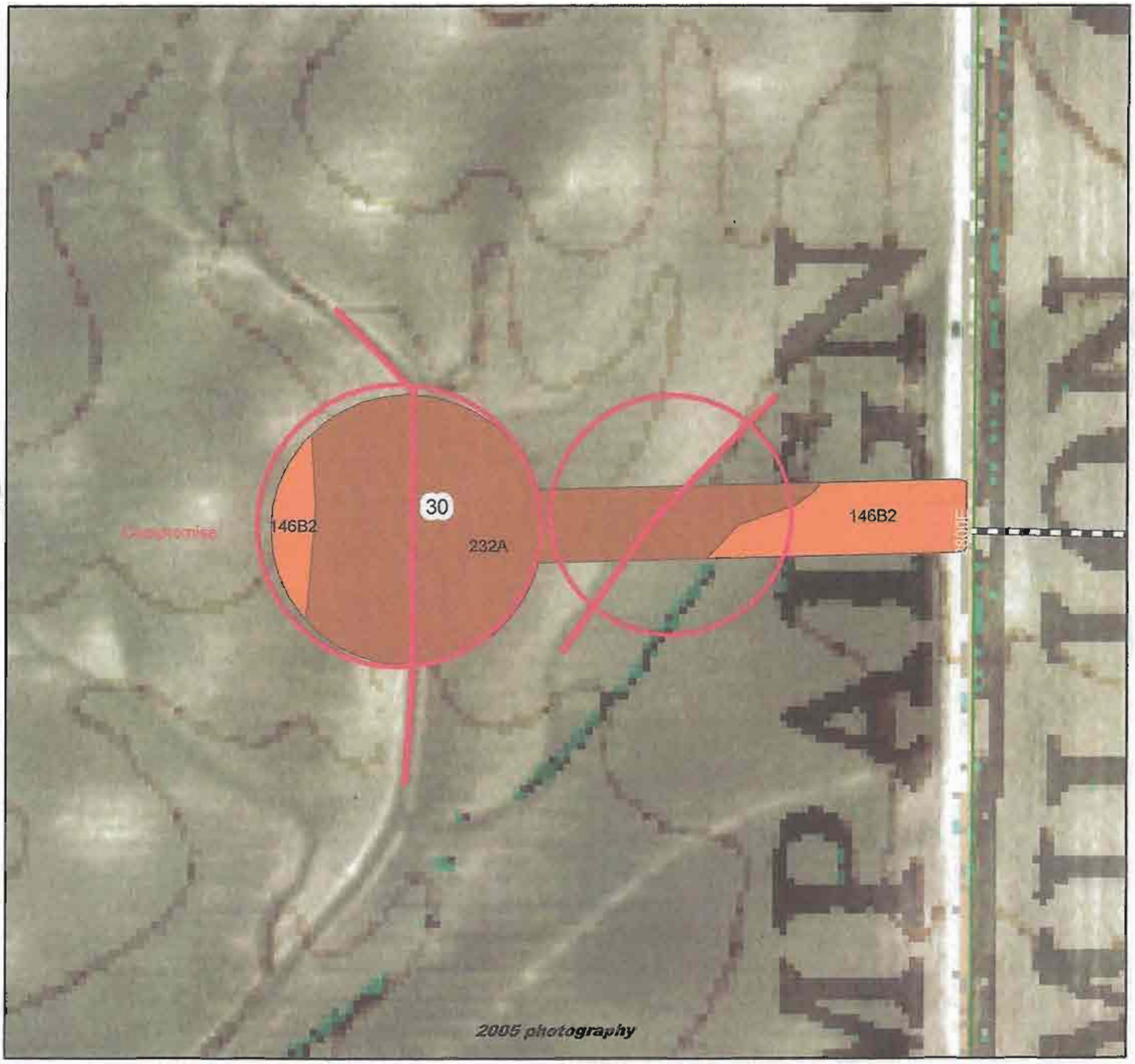
Soil Limitations:

The 146B2 (Elliott Silty Clay Loam) soil has a 2-4% slope that could be an issue with water flowing over the access road possibly causing erosion of the road surface or depositing silt on the access road. The area is small and probably won't cause a problem.

Site Limitations:

The access road has two sites (see photo) where concentrated flow crosses the road that will need increased protection to keep it from washing away when water flows over it. They are marked with red circles with the concentrated flow area a solid red line.

California Ridge Wind Farm
Turbine #30



Turbine # 30

Invenergy Construction-Areas-Buffer-Zone Soils Map Data

Soil Map Unit	Name	Slope %	Water Table (feet) / Months	
146B2	Elliott silty clay loam	2-4	1-2	Jan-May
232A	Ashkum silty clay loam	0-2	Surface-1	Jan-May

Soil Map Unit	Drainage Class	Erosion Hazard	Hydric Soils	
146B2	Somewhat poorly drained	slight	No	
232A	Poorly drained	slight	Yes	
	0			
	0			
	0			

Soil Map Unit	Concrete Corrosion	Steel Corrosion	
146B2	Low	High	
232A	Low	High	
	0		
	0		
	0		

Soil Map Unit	Local Roads / Streets	Shallow Excavations
146B2	Very limited (1,2,3,4)	Very limited (4,5,6)
232A	Very limited (1,2,3,4,7)	Very limited (4,5,7)
	0	
	0	
	0	

1) Low strength
2) Shrink-swell
3) Frost action
4) Depth to saturated zone
5) Cutbanks cave
6) Dense layer
7) Ponding
8) Slope
9) Wetness