

**PLANNING COMMISSION RECOMMENDATIONS  
TO THE BOARD OF COUNTY COMMISSIONERS  
December 5, 2013**

**A. Proposed Policy Changes**

**Mineral Lands Comprehensive Plan Policies**

**GOAL: To protect and ensure appropriate use of gravel and mineral resources of the county, and minimize conflict between surface mining and surrounding land uses.**

**3.5 Policies**

- 3.5.1 Support the conservation of mineral lands for productive economic use by identifying and designating lands that have long-term commercial significance for mineral extraction and that are not already characterized by urban growth.**
- 3.5.2 Designate mineral resource lands based on the following:
  - a. geological, environmental, and economic factors;**
  - b. surrounding land uses, zoning, and parcel size; and**
  - c. the suitability of public access roads to be used as haul roads.****
- 3.5.3 Ensure that mineral extraction and processing operations minimize and mitigate any significant adverse impacts on water, fish, wildlife, and nearby land uses.**
- 3.5.4 Ensure that the use of adjacent lands will not interfere with the continued use of designated Mineral Resource lands for the extraction of minerals in the accustomed manner and in accordance with best management practices. [Dentler paraphrased for clarity and consistency]**
- 3.5.5 Establish notification standards whereby developments on lands in the vicinity of designated mineral resource lands are given notice that they are locating in or adjacent to a potential mining area.**
- 3.5.6 The surface mining overlay shall not be designated within rural residential (R) zones except to allow the expansion of an existing mining site.**
- 3.5.7 Surface mining other than Columbia River dredging shall not occur within the 100-year Floodplain except for projects with an approved Habitat Conservation Plan.**

**Move to Transportation policies: Capital improvement plans should take into consideration maintaining and upgrading public roads adequate to accommodate transport of mineral commodities.**

## **STRATEGIES FOR MINERAL RESOURCE LANDS**

**Maintain a map showing areas designated with the surface mining overlay and permitted mining sites.**

**Develop a program for coordinated monitoring and enforcement of conditions of approval for active mining sites.**

### **B. Procedure & Draft Criteria to Amend the Surface Mining Overlay**

*(Keep Section 40.560.020 Changes to Districts, Amendments, Alterations as is. Adopt the following as a new Section 40.560.010(S), re-number subsequent sections and correct citations.)*

- S. Additional Criteria for Surface Mining Overlay Changes.**
- 1. Amendments to the plan map to designate additional areas with the Surface Mining Overlay shall demonstrate that the following criteria have been met:**
    - a. The quality of the resource is sufficient for the intended uses;**
    - b. The quantity and characteristics of the resource including the size of the deposit, the depth of overburden, the distance to market, the cost of transport and resource availability in the region, suggest that mining is economically viable;**
    - c. At least sixty percent (60%) of the area within one thousand (1000) feet of the proposed mineral resource land is characterized by parcels of five (5) acres or larger.**
  - 2. Amendments to the plan map to remove the Surface Mining Overlay shall demonstrate that one of the following conditions is met:**
    - a. The mineral resources have been depleted;**
    - b. There is evidence that the mining of the mineral resource is not economically feasible based on the factors listed in Section 40.560.010(S)(1)(b);**
    - c. Environmental or access constraints make it impractical to mine the resource; or**
    - d. The area has been brought into an urban growth boundary or adjacent land uses or developments are incompatible with mineral extraction.**

## **C. Draft Surface Mining Overlay Standards**

### **40.250.020 SURFACE MINING OVERLAY DISTRICT**

*(Repeal current 40.250.020 and replace)*

#### **A. Purpose.**

The purpose of the surface mining overlay district is to ensure the continued availability of rock, stone, gravel, sand, earth and mineral products without disrupting or endangering adjacent land uses, while safeguarding life, property and the public welfare.

#### **B. Applicability.**

1. The provisions in this section shall apply to parcels designated with the surface mining overlay. Surface mining activity and related processing within the Columbia River Gorge National Scenic Area is subject to Section 40.240. Where Section 40.250.020 is in conflict, the provisions of section 40.240 govern.
2. The provisions of this section shall apply only to new applications for surface mines and related uses and expansions of existing mines. Operation of existing surface mines and related uses shall conform to the conditions of approval adopted with their site plan and/or conditional use approval.
3. Provisions of Chapter 78.44 RCW and Chapter 332-18 WAC pertaining to surface mining that are applicable to Clark County are adopted by reference.

#### **C. Uses.**

1. Permitted uses. In addition to uses allowed in the underlying zoning district, the following uses are permitted in the surface mining overlay district:
  - a. Extractions of rock, stone, gravel, sand, earth and minerals and the sorting, and stockpiling of such materials.
  - b. Temporary offices, shops or other accessory buildings and structures used for the management and maintenance of onsite mining and processing equipment.
2. Conditional uses. In addition to uses allowed conditionally in the underlying zoning district, the following uses are allowed in the surface mining overlay district, subject to conditional use approval:
  - a. Asphalt mixing
  - b. Concrete batching;
  - c. Clay bulking;
  - d. Rock crushing.

**D. Standards.**

- 1. Site area.** When the activity includes both extraction and any one of the uses listed on Section 40.250.020(C)(2), the total site area shall be a minimum of twenty (20) acres. Activities which are limited to extraction only shall not have a minimum site size.
- 2. Setbacks.**
  - a.** A minimum 200-foot setback shall be required for all mining uses abutting existing residential structures or adjacent rural residential zoning. The setback may be reduced by the approval authority if the purposes of this chapter can be met with the reduced setback. The setback area shall be used only for roads, berms, landscaping, signs, fencing and reclamation activities.
  - b.** Adjacent properties shall maintain a 100-foot setback from designated mineral resource land. The setback may be reduced by the approval authority if the purposes of this chapter can be met with the reduced setback or if it is not feasible to meet the setback due to site constraints. Setbacks shall not apply to existing structures.
- 3. Access.** Roads into the site shall be gated and the site or mining area shall be fenced and posted "No Trespassing".
- 4. Noise.** Maximum permissible noise levels must be in accordance with the provisions of Chapter 173-60 WAC or as identified in the SEPA document.
- 5. Hours and days of operation.**
  - a.** No operations shall take place on Sundays or on the following legal holidays: New Year's Day, Memorial Day, July 4<sup>th</sup>, Labor Day, Thanksgiving Day, Easter, MLK Day, Veterans Day and Christmas Day.
  - b.** All operations and activities other than blasting and maintenance are restricted to the hours of 6:00 a.m. to 6:00 p.m. Monday through Friday and 8:00 a.m. to 5:00 p.m. Saturday.
  - c.** Blasting is restricted to the hours of 9:00 a.m. to 4:00 pm Monday through Friday.
  - d.** Maintenance activities, excluding mining, crushing, and loading, may be performed outside the normal hours of operation, provided that no equipment with narrow-band (beeping) back-up alarms is used. Noise levels must comply with night-time noise requirements.
  - e.** Loading and hauling outside of normal hours of operation may be approved by the responsible official provided that:
    - (1)** the applicant provides at least fourteen (14) days notice to the county prior to the event such that the county can provide at least ten (10) days notice to property owners within one-half (1/2) mile of the site boundary and to owners of all parcels abutting local access roads to be used for hauling that

are between the site and roads designated in the Arterial Atlas as connectors, arterials, or State highways;

- (2) the applicant provides evidence that the contract requires delivery of rock or rock products outside of normal operating hours; and
  - (3) all equipment shall utilize broadband back-up alarms or reverse-activated strobe lights conforming to Mining Safety and Health Administration (MSHA) requirements.
  - (4) In an emergency, the responsible official may waive the requirements of this subsection.
6. Stormwater and erosion control must meet the standards of Chapter 40.385.
  7. Blasting and mining activities must not adversely affect the quality or quantity of groundwater or groundwater wells or cause damage to offsite structures.
  8. Notice of blasting events shall be provided by the operator to property owners within one-half (1/2) mile of the mining limits by mail at least seven (7) days prior to blasting. Any person requesting notice via electronic communication shall be notified at least twenty-four (24) hours prior to blasting.
  9. Mining activities must meet applicable Federal, State and county standards governing odors, dust, smoke, blasting and vibration. Lighting shall not cast significant light or glare on adjacent properties.
  10. The director of public works may require pavement wear agreements for public roads used to access the site. Public access roads to mining sites must be maintained to the satisfaction of the director of public works, to minimize problems of dust, mud, potholes, runoff and traffic safety. All vehicles shall comply with RCW 46.61.655 (escape of load materials and cleaning of vehicles).
  11. Internal access roads shall be paved within one hundred (100) feet of a paved county road or state highway to reduce tracking of dirt, mud and rocks.
  12. The applicant shall identify the source or potential source and approximate amount of water anticipated to be used on the site. If this amount exceeds the exemption provided for under RCW 90.44.050, the applicant must present evidence that adequate water can be made available.

**E. Approval Process.**

1. Plans shall be drawn to an engineer's scale and shall be of sufficient clarity to indicate the nature and extent of the work proposed and show in detail that they will conform to the provisions of this section and all other relevant laws, ordinances, rules and regulations. The first sheet of each set of plans shall give the location of the work, the names and addresses of the owner, and the person by

whom they were prepared. The plans shall include the following minimum information:

- a. General vicinity maps of the proposed site;
  - b. Property boundaries and accurate contours of existing ground, details of existing terrain, and details of existing area drainage;
  - c. Proposed elevations and contours of the greatest extent of the proposed mining and proposed drainage channels and related construction;
  - d. Detailed plans of all surface and subsurface drainage devices, walls, cribbing, dams, berms, settling ponds and other protective devices to be constructed with or as a part of the proposed work, together with the maps showing the drainage area and the estimated runoff of the area served by any drains;
  - e. Location of any buildings or structures on the property where the work is to be performed, and the location of any buildings or structures on land of adjacent property owners which are within two hundred (200) feet of the property;
  - f. Location of access roads and primary haul routes.
  - g. Stormwater calculations and proposed treatment facilities for runoff from access roads and impervious areas; and
  - h. A hydrogeology report which characterizes the groundwater and surface water and identifies wells within one-half (1/2) mile of the proposed mining limits and a monitoring and mitigation plan if there are existing wells within one-half (1/2) mile of the proposed site.
  - i. A traffic impact analysis including the following elements, or as directed by the director of public works:
    - (1) Trip generation, including passenger & haul vehicles;
    - (2) Trip assignment and distribution;
    - (3) Capacity analysis: Existing and proposed operational LOS at the site access and intersections along primary and secondary haul routes including any proposed mitigations;
    - (4) Safety analysis: Sight distance at intersections and crash history at intersections and along all haul route corridors, including any proposed mitigations;
    - (5) Vehicle maneuvering analysis: Turning movements at intersections and tracking at intersections and horizontal curves including any proposed mitigations; and
    - (6) Structural capacity analysis: Remaining life of primary and secondary haul routes under current and proposed loading including any improvements needed to achieve a 15-year structural capacity.
2. Site plan approval is required prior to any surface mining use.
  3. For those uses permitted under Section 40.250.020(C)(1), the responsible official shall review and approve plans, specifications, and other supporting data through a Type II-A process pursuant to Section 40.510.025.
  4. Conditional uses permitted under Section 40.250.020(C)(2) shall be reviewed through a conditional use process pursuant to Section 40.520.030.
  5. For temporary uses permitted under Section 40.250.020(C)(1)(b) that are not exempt from review per Section 40.260.220(C)(3)(b), the responsible official shall

review and approve plans and specifications through a Type I process pursuant to Section 40.510.010.

6. Notice required by Sections 40.250.020(E)(3) and (4) above shall be sent to owners of property within a radius of one (1) mile of the site and to owners of all parcels abutting local access roads identified as the primary haul route that are between the site and roads designated in the Arterial Atlas as collectors, arterials or State highways.

**F. Monitoring and Enforcement.**

[The Planning Commission recommended that staff draft monitoring and enforcement provisions that would be practical given current County resources.]

40.260.220 Temporary Uses and Structures

C. Uses and Exceptions.

3. Exceptions. Certain structures and uses are exempt from the requirement to obtain a temporary use permit. However, building and fire code requirements still apply. The following are exempt from the requirement for a temporary use permit:
  - b. For nonresidential districts: Temporary construction trailers, construction materials, and equipment storage areas, and construction offices accessory to a construction or mining site.

~~40.260.120 Mines, Quarries and Gravel Pits~~


~~Extractions from deposits of rock, stone, gravel, sand, earth, minerals, or building or construction materials shall not be construed to be permitted uses in any district established by this title except as provided in specific districts, unless a surface mining overlay district has been obtained, as provided for in Section 40.250.020, except for on-site excavation and grading in conjunction with a specific construction or improvement project. Odor, dust, noise or drainage shall not be permitted to create or become a nuisance to surrounding property. The responsible official may approve a request for an aggregate extraction for a single construction project for a period not to exceed ten (10) days in operation and not requiring a state permit, in accordance with Section 40.260.220, Temporary Uses.~~

Surface Mining Overlay Map - Planning Commission Recommendations				
Map #	Name	Recommendation	Vote	Rationale
1	Morgan	Reduce area per submittal	5 to 0	Better matches extent of the proven resource
2	Goose Hill	Add overlay as proposed	5 to 0	Meets criteria for mapped resource area
3	Maple Ridge	Add overlay as proposed	5 to 0	Meets criteria for mapped resource area
4	S of Tebo	Don't add overlay	3 to 2	No proven resource; adverse impacts from existing pit
5	Courtney Pit	Add overlay as proposed	5 to 0	Expands overlay around existing mine; mapped resource
6	Chelatchie Creek	Add overlay as proposed	5 to 0	Meets criteria for mapped resource area
7	Chelatchie Rock	Add overlay as proposed	5 to 0	Expands overlay around existing mine; mapped resource
8	Yacolt Mtn	Don't add overlay	4 to 1	Topography, road access, endangered species impacts; more suited for forest
9	Matilla	Don't add overlay	3 to 2	No mapped or proven resource
10	Bells Mtn	Don't add overlay	3 to 2	Impacts to Salmon Ck & East Fork fish & wildlife; Berry Rd access unsuitable
11	Spotted Deer	Add overlay as proposed	5 to 0	Expansion of existing DNR area already approved
12	Little Baldy Mtn	Don't add overlay	5 to 0	Study of traffic safety & adequacy of 262nd Ave/53rd St/Bradford needed
13	Diamond Ridge	Don't add overlay	5 to 0	Livingston & Hancock Rds. are not suitable for truck traffic
14	WSDOT parcel	Don't add overlay	5 to 0	Livingston & Hancock Rds. are not suitable for truck traffic
15	Washougal Pit	Add overlay as proposed	5 to 0	Re-designates an existing mine w/in the Gorge Scenic Area



INTEROFFICE MEMORANDUM  
Transportation Division

Clark County, Washington  
Department of Public Works

TO: Michael Mabrey  
FROM: Ejaz Khan, P.E.; Traffic Engineer   
DATE: October 1, 2013  
SUBJECT: Livingston Mountain Quarry Overlay District.

Based on the proposed land use information regarding the mining overlay district in the Livingston Mountain area, I have evaluated the area roadway corridors for traffic safety and operations. The trucks from and to the proposed mining area can access via either Livingston Mountain Road or via Hancock Road. Livingston Mountain Road is a two lane paved roadway with lane width ranging between 10 and 11 feet. The entire corridor has significant horizontal and vertical curves. The corridor is stripped with centerline and edge line up to Hancock Road. Beyond Hancock Road, the corridor is only stripped for centerline.

There were a few segments along Livingston Mountain Road corridor that were of particular concern from traffic safety and operations point of view. The first location was the intersection of Livingston Mountain and Hancock Road. The intersection location has a combination of horizontal and vertical curve. The grade on the curve is approximately 14%. The terrain severely limits the sight distance of oncoming vehicles at this location. Exhibit 1 illustrates the drivers view approaching the curve looking north. Immediately north of Hancock Road intersections there are several sharp curves with sight distance restriction. The pavement width slightly narrows north of Hancock Road and there are drop-offs on the east side. The pavement narrows slightly further north of 70<sup>th</sup> Street (Private road) accompanied by several sharp curves and drop-offs. Exhibit 2 illustrates driver's view on another curve north of 70<sup>th</sup> street looking south.

Hancock Road corridor is initially a paved road with an initial pavement width of 18 to 19 feet. This corridor also has several sharp horizontal curves. Exhibit 3 illustrates a view of Hancock road. The pavement width narrows heading eastbound and the pavement condition continue to worsen. The pavement width in front of "Estate at Livingston Mountain" is between 15 to 16 feet. The pavement further down from "Estate at the Livingston Mountain" is uneven, narrow and gravel road and unsuitable for truck traffic.

**Conclusion:**

From traffic safety and operations point of view, a large truck with trailer travelling at a slow speed occupies approximately 11.5 feet when negotiating a curve alignment of 300 feet and approximately 13.5 feet when negotiating a curve of 150 feet radius (representing a sharp curve). The space occupied by the truck takes into account the off-tracking and the swept path of the truck.

Given that there would need to be certain shy distance or clearance between the opposing vehicles and the lane width on Livingston Mountain Road range between 10 and 11 feet, the corridor would be unsuitable for truck traffic. The grades along the corridor and the lack of available line of sight, around the sharp curves, between approaching vehicle further add to the corridor's unsuitability for heavy truck traffic from traffic safety and operations point of view.



CC: Matt Griswold, P.E.; -Traffic Engineering Manager

INTEROFFICE MEMORANDUM  
Transportation Division

Clark County, Washington  
Department of Public  
Works

TO: Michael Mabrey

FROM: Ejaz Khan, P.E.; Traffic Engineer EK

DATE: December 26, 2013

SUBJECT: Livingston Mountain Quarry Overlay District.

I have evaluated the suitability of NE 262<sup>nd</sup> Avenue roadway corridor for Quarry gravel truck movement, traffic safety and operations. The vicinity map in figure 1 highlights the corridor and intersection evaluated in this study. The trucks from and to the proposed mining area would access via NE 262<sup>nd</sup> Avenue off NE Bradford Road. NE 262<sup>nd</sup> Avenue is a two lane paved roadway with lane width ranging between 11 and 12 feet and some gravel shoulder. The dead end road of NE 262<sup>nd</sup> Avenue was recently overlaid by the County and the pavement appears to be in excellent condition. The corridor is unposted for basic speed and is centerline stripped. The corridor is well signed with appropriate traffic control devices and warning signs for safe traffic operations. The corridor has some horizontal and vertical curves and grades up to 16%. Despite the terrain and corridor alignment, none of the horizontal or vertical curves were severe enough to inhibit the safe movement of quarry trucks or create traffic safety and operations issues. NE 262<sup>nd</sup> Avenue currently carries an ADT of approximately 300 vehicles per day. Crash data for the intersection indicate only one crash over a period of 5 years.

The NE 262<sup>nd</sup> Avenue intersection with Bradford Road is controlled via a STOP sign. The STOP control for NE 262<sup>nd</sup> Avenue is visible to the approaching driver, driving a passenger vehicle, from a distance of 800 feet. This would be adequate distance to bring a vehicle to a safe stop. Additionally a "STOP AHEAD" warning sign precedes the STOP control sign. NE 262<sup>nd</sup> Avenue approaching Bradford Road is on a downhill grade. Steps could be taken to further improve the traffic safety at the intersection. The safety improvements are narrated in the conclusion and recommendation section of this report.

NE Bradford Road is unposted for basic speed. It is centerline and edge line stripped and has 11 feet wide travel lanes. Bradford Road approaching NE 262<sup>nd</sup> Avenue from the west has a reverse curve alignment with an advisory speed of 30 MPH. The intersection sight distance from NE 262<sup>nd</sup> Avenue, looking east, with drivers' eye 15 feet back of the travelled way, was measured as 700 feet. The sight distance looking west was measured as 330 feet. The horizontal curve alignment of the road and the roadside trees inhibit the line of sight. An advance intersection warning sign at 300 feet ahead of 262<sup>nd</sup> Avenue is installed on Bradford Road. Bradford Road at NE 262<sup>nd</sup> Avenue currently carries an ADT of approximately 1,500 vehicles per day.

The NE 262<sup>nd</sup> Avenue intersection with Bradford Road has a very wide throat with large intersection radius return enabling large vehicles safe and easy ingress and egress from the intersection. The visibility of an eastbound vehicle on Bradford Road waiting to make a left turn on 262<sup>nd</sup> Avenue was measured as 230 feet. The sight distance for the eastbound approaching vehicle is obstructed due to curved road alignment and trees in the line of sight. An intersection extension line is striped across NE 262<sup>nd</sup> Avenue connecting the edge of travelled way of Bradford Road. The extension line provides positive guidance to the drivers, across the very wide throat of the intersection and allows drivers to stop closer to the edge of travelled way. This allows for improved sight distance and enhanced traffic operations.

Heading east on Bradford Road/ 53<sup>rd</sup> Street and south on NE 292<sup>nd</sup> Avenue/Reilly Road, I observed the pavement to be in good condition. The corridor is unposted for basic speed and is centerline and edge line striped with 11 feet wide travel lane. The corridor is well signed with appropriate traffic control devices and warning signs for safe traffic operations. The corridor has some horizontal and vertical curves and grades up to 13%. Despite the terrain and corridor alignment, none of the horizontal or vertical curves were severe enough to inhibit the safe movement of quarry trucks or create a traffic safety or operational issue. The intersection of NE 39<sup>th</sup> Street and NE 292<sup>nd</sup> Avenue is an all-way stop control.

Reilly Road at Blair Road is a T intersection with a STOP control for Reilly Road. The Blair Road corridor is unposted for basic speed and is centerline and edge line striped. Reilly Road currently carries an ADT of approximately 1,200 vehicles per day. The stop sign on Reilly Road is visible to a southbound sedan vehicle driver, from a distance of from a distance of 490 feet. This is adequate distance to bring a vehicle to a safe stop. Additionally a supplemental "STOP AHEAD" warning sign precedes the STOP control sign. Looking west (right) the intersection sight distance with driver's eye 15 feet back of the travelled way was measured as 1,475 feet. Looking east (left), the intersection sight distance was measured as 320 feet. The vertical curve on Blair Road is responsible for inhibiting the sight distance. It should be noted that the sight distance measured is based on driver's eye height on Blair Road as 3.5 feet. The driver's eye height driving a truck would be approximately eight feet high and that would make a significant difference the available sight distance for a vehicle stopped on Reilly Road. Observation during the field visit indicated that the operational speed for vehicles westbound on Blair Road at Reilly Road is 40 MPH. Blair Road at Reilly Road currently carries an ADT of approximately 3,200 vehicles per day. Crash data for the intersection indicate only one crash over a period of 5 years.

#### **Conclusion and recommendations:**

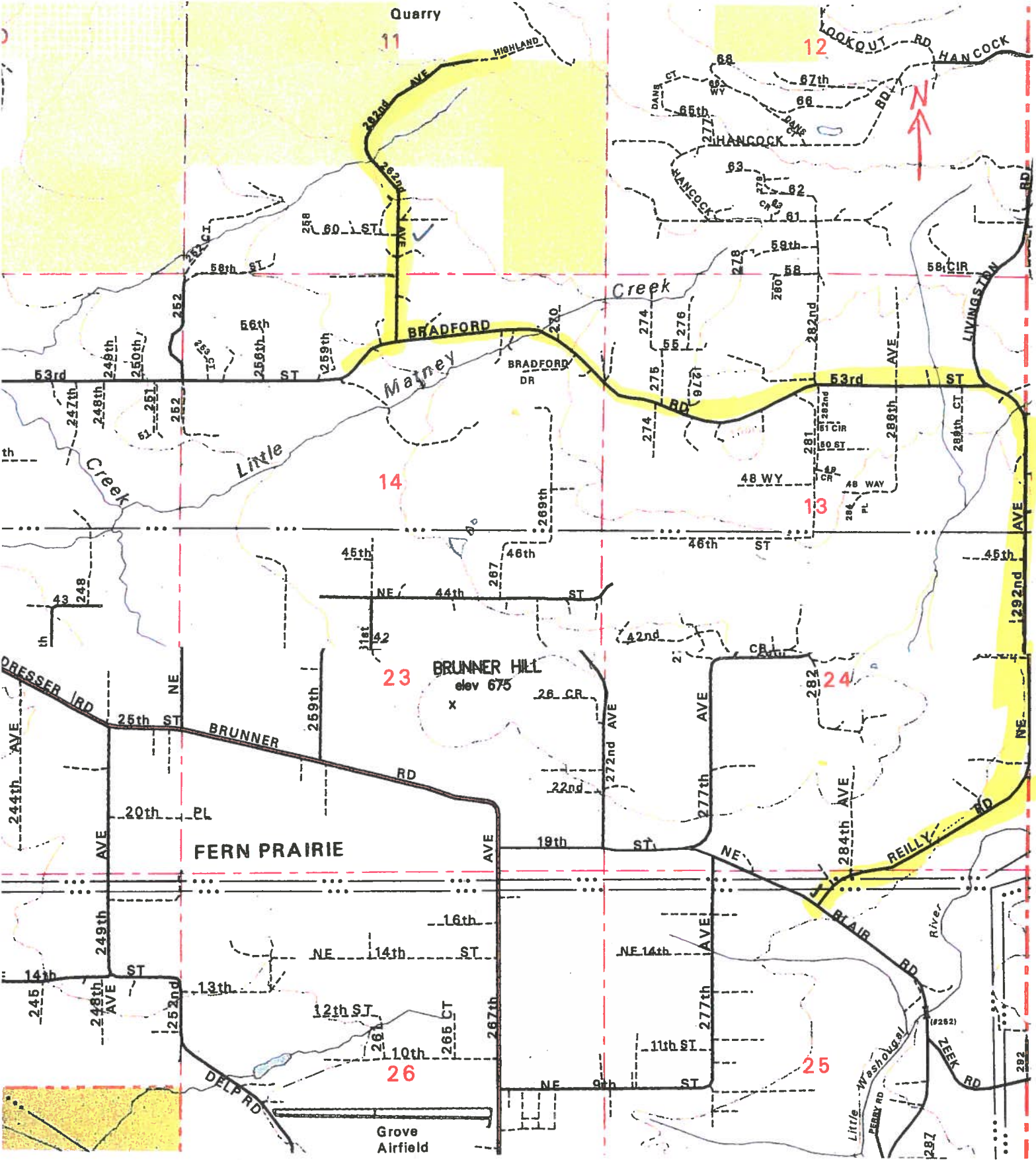
The traffic safety and operations evaluation for the quarry mining operations was limited in scope. The information regarding trips generated by the proposed operation, the hours of operation and the peak hour of operation and the traffic assignment was not available. Elements like queue length and warrants for left turn lane were not evaluated as a part of the evaluation. The following are the

conclusion and recommendation for the 262<sup>nd</sup> Avenue, Bradford Road, NE 292<sup>nd</sup> Avenue, Reilly Road corridor.

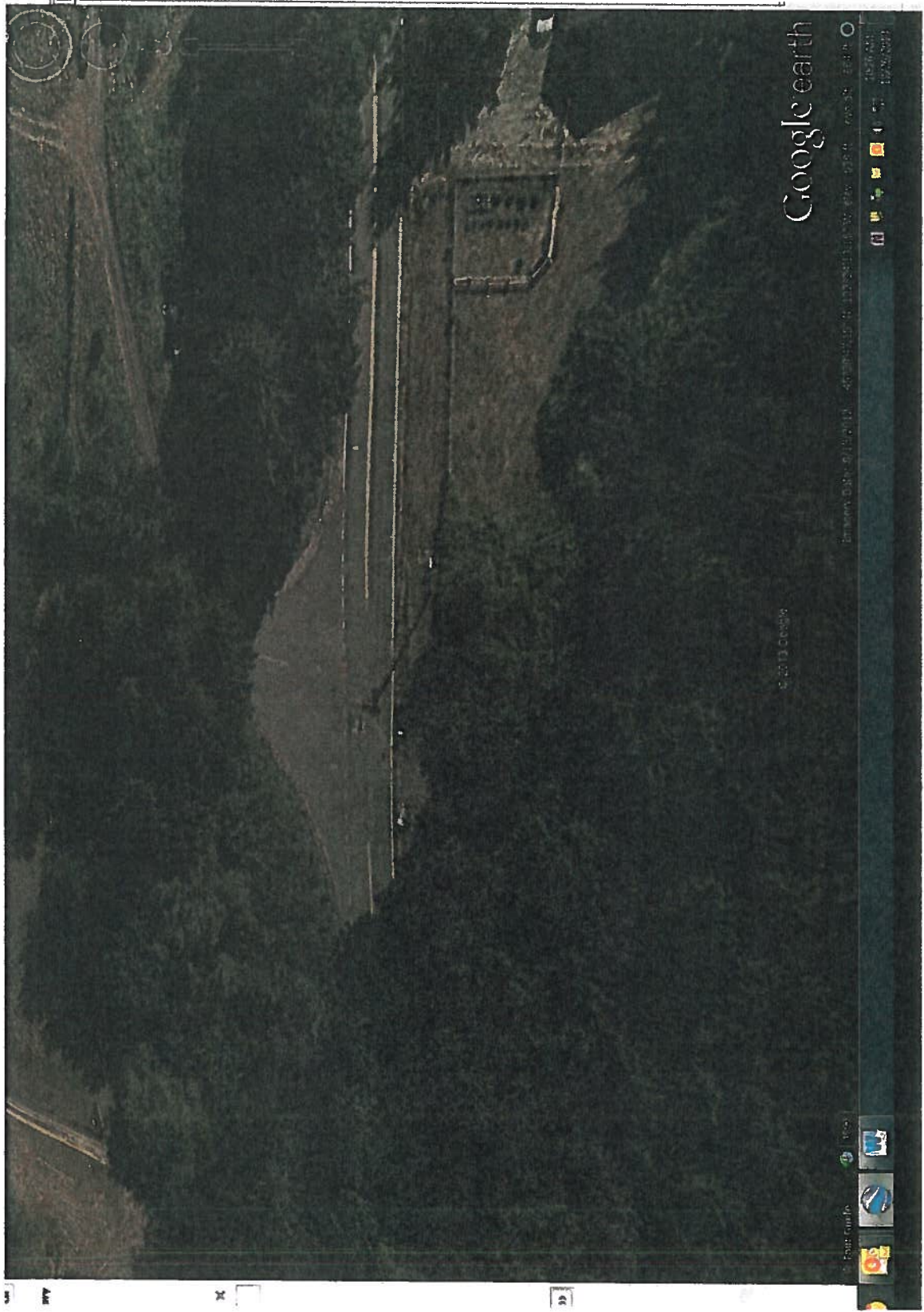
1. Crash data indicate that the NE 262<sup>nd</sup> Avenue corridor has been operating within acceptable safety threshold.
2. Crash data indicate that the intersection of NE 262<sup>nd</sup> Avenue and Bradford road has been operating within acceptable safety threshold.
3. Crash data indicate that the Bradford Road, NE 292<sup>nd</sup> Avenue, Reilly Road corridor has been operating within acceptable safety threshold.
4. Crash data indicate that the intersection of Reilly Road and Blair Road has been operating within acceptable safety threshold.
5. The geometric layout and the horizontal and vertical alignment of the NE 262<sup>nd</sup> Avenue corridor will allow safe movement of quarry trucks to and from the mine.
6. The geometric layout NE 262<sup>nd</sup> Avenue at its intersection with Bradford Road will allow for safe ingress and egress movement for gravel trucks.
7. The Stop sign on NE 262<sup>nd</sup> Avenue at Bradford Road is visible from sufficient distance to allow a safe stop. However, removal to two trees in the immediate vicinity of the STOP control will further improve the line of sight and consequently enhance traffic safety.
8. Since NE 262<sup>nd</sup> Avenue approaching Bradford Road is on a relatively long negative downhill grade, it is recommended that "Pavement friction management" be implemented at its approach with Bradford Road to ensure a safe stop by a loaded gravel truck.
9. Since NE 262<sup>nd</sup> Avenue approaching Bradford Road is on a negative downhill grade, it is recommended that the approach with Bradford Road be white topped (cement concrete pavement surface) to prevent southbound loaded gravel trucks from destroying the pavement.
10. The visibility of vehicle eastbound on Bradford Road waiting to make a left turn was measured as 230 feet. This distance may not be adequate to prevent a rear end crash by a eastbound approaching vehicle. A more detailed study ascertaining left turn queue length, left turn lane warrants, operating speed and traffic volumes at the approach will be necessary to make a more definite assessment.
11. The intersection sight distance from NE 262<sup>nd</sup> Avenue, looking west (right) along Bradford Road was measured as 330 feet. This sight distance is not adequate for a safe left turn out of NE 262<sup>nd</sup> Avenue. A loaded gravel truck would require a much higher sight distance than the nominal sight distance of ten times the posted speed. A more detailed study would be necessary to determine the necessary intersection sight distance.

12. The intersection sight distance from NE 262<sup>nd</sup> Avenue, looking east (left) along Bradford Road was measured as 700 feet. This sight distance meets the minimum requirement for making a right turn out of 362<sup>nd</sup> Avenue. Note that the 700 feet sight distance was based on driver eye height of 3.5 feet.
13. The geometric layout and the horizontal and vertical alignment of the Bradford Road, 53<sup>rd</sup> Street, 292<sup>nd</sup> Avenue and Reilly Road will allow safe movement of gravel trucks.
14. The Stop sign on Reilly Road at Blair Road is visible from a distance of 490 feet to allow a safe stop. A supplemental Stop Ahead sign has also been installed.
15. The intersection sight distance from Reilly Road, looking west (right) along Blair Road was measured as 1,475 feet. This sight distance is adequate for making a safe left turn out of Reilly Road.
16. The intersection sight distance from Reilly Road, looking east (left) along Blair Road was measured as 320 feet. This sight distance is inadequate for making a safe left turn out of Reilly Road. The vertical curve along Blair Road restricts the available sight distance. However, a much better sight distance would be available to the truck driver since the truck driver's eye is situated at a much higher level than a regular (sedan) passenger vehicle. Proper equipment was not available at the time of field visit to determine the intersection sight distance based of truck driver eye height and data could not be recorded.

CC: Matt Griswold, P.E.; -Traffic Engineering Manager



**VICINITY MAP**

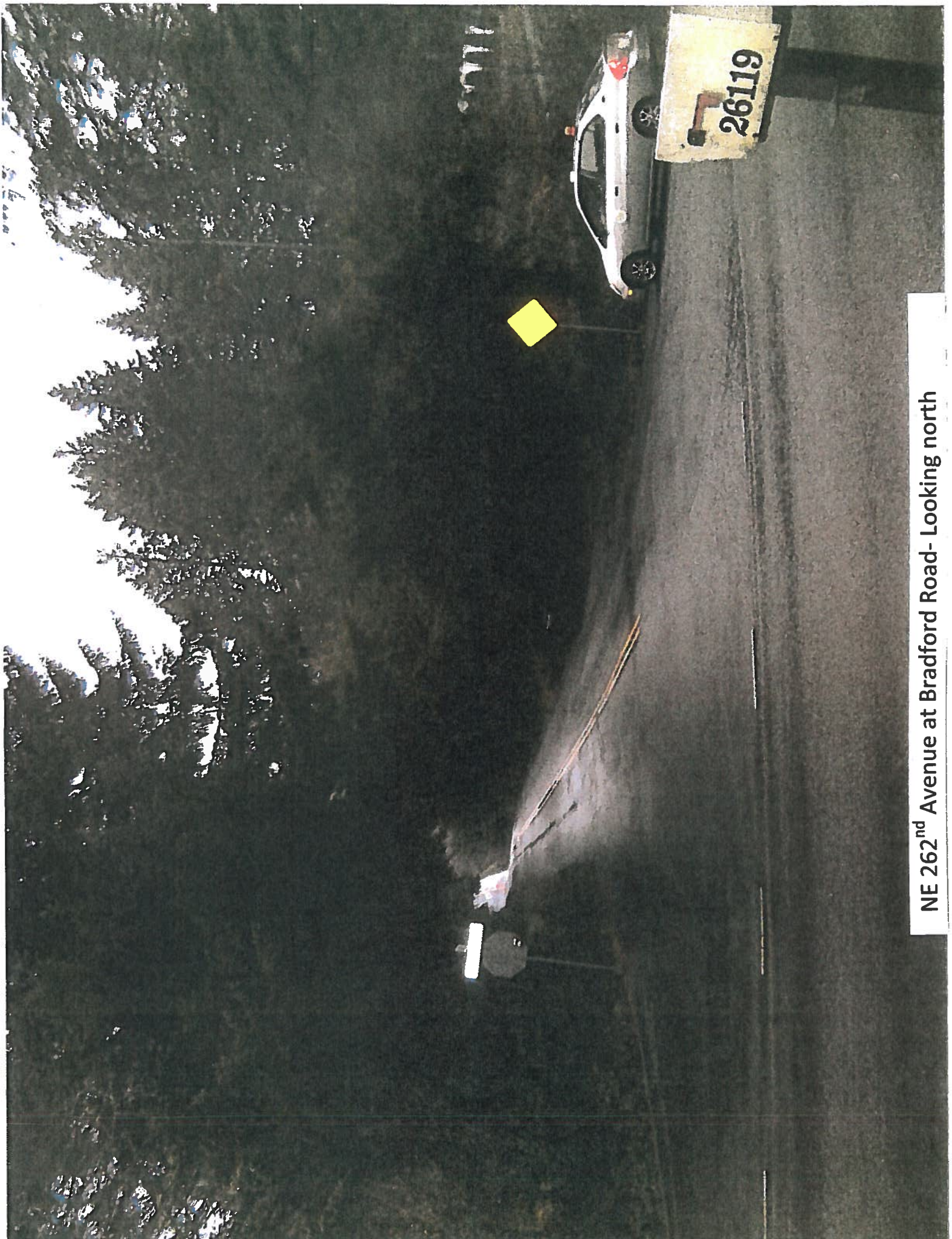


NE 262<sup>nd</sup> Avenue at Bradford Road- Aerial View





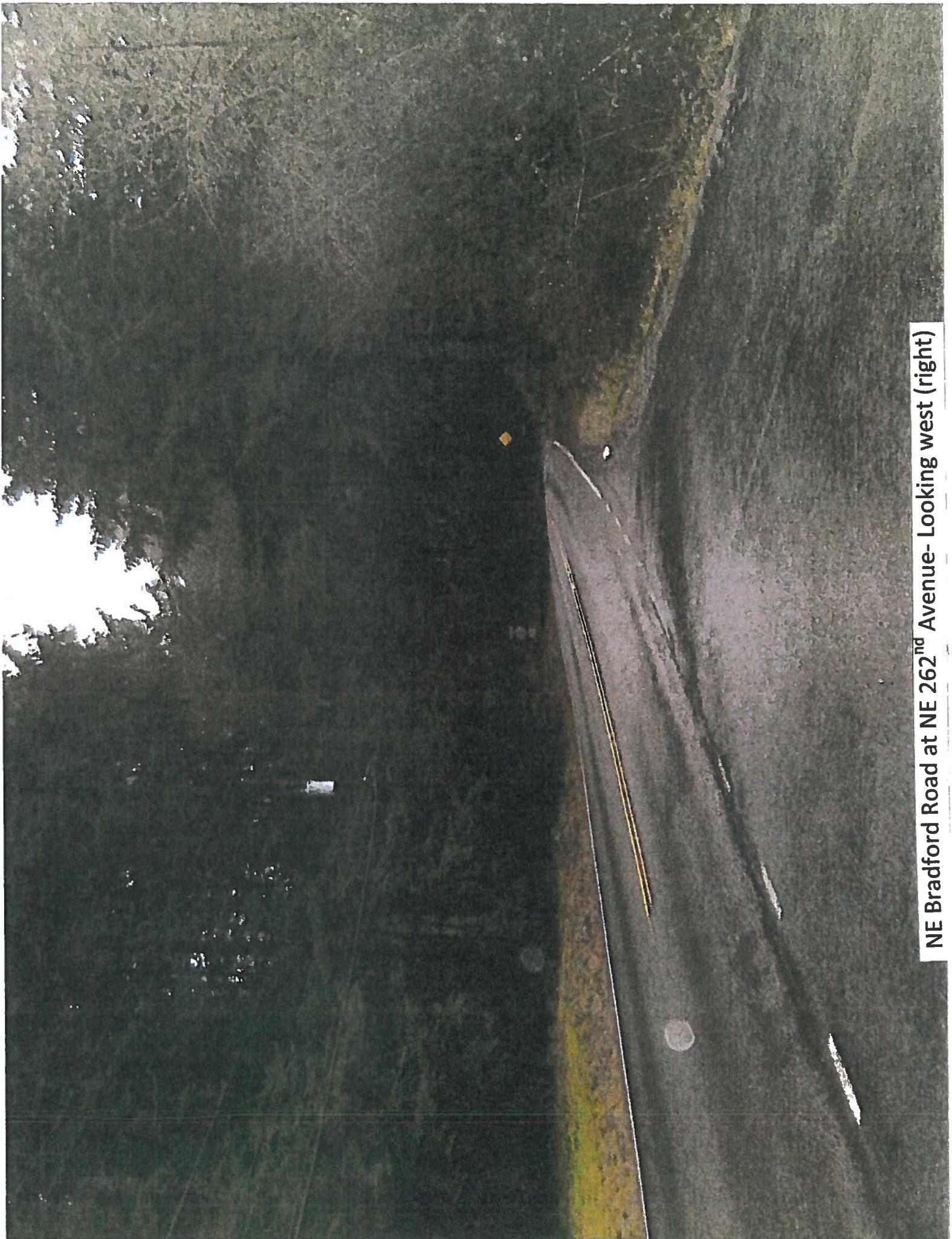
NE 262<sup>nd</sup> Avenue at Bradford Road looking South



NE 262<sup>nd</sup> Avenue at Bradford Road- Looking north



NE Bradford Road at NE 262<sup>nd</sup> Avenue- Looking east (left)



NE Bradford Road at NE 262<sup>nd</sup> Avenue- Looking west (right)



NE Reilly Road at Blair Road- Looking north



NE Blair Road at Reilly Road- looking south



NE Blair Road at Reilly Road- Looking east (left)

INTEROFFICE MEMORANDUM  
Transportation Division

Clark County, Washington  
Department of Public Works

TO: Michael Mabrey  
FROM: Ejaz Khan, P.E.; Traffic Engineer EK  
DATE: December 27, 2013  
SUBJECT: Berry Road Quarry Overlay District.

I have evaluated the Berry Road corridor east of NE 240<sup>th</sup> Avenue for gravel truck traffic safety and operations. Berry Road is a two lane paved roadway with total pavement width ranging between 23 feet and 26 feet. The entire corridor has significant horizontal and vertical curves, steep grades and combination horizontal and vertical curves. The corridor is centerline stripped up to Kaskilla, a distance of approximately 1.5 miles. East of Kaskillah the road width narrows down to approximately 18 feet and is not stripped. Berry Road is a low volume road and carries an estimated traffic volume of 125 vehicles per day. Crash data indicate two crashes over the length of the corridor over a period of five years. The sample size is too small to make a conclusive determination over regarding the safety record of the corridor.

Visual assessment of the pavement condition indicates the pavement to be in poor condition. Guardrails along the corridor are installed against the edge of the travelled way with no shy distance. Vehicles appeared to have sideswiped against the guardrail. The entire corridor is windy with sharp curves. The terrain severely limits the sight distance of oncoming vehicles at various locations throughout the corridor.

**Conclusion:**

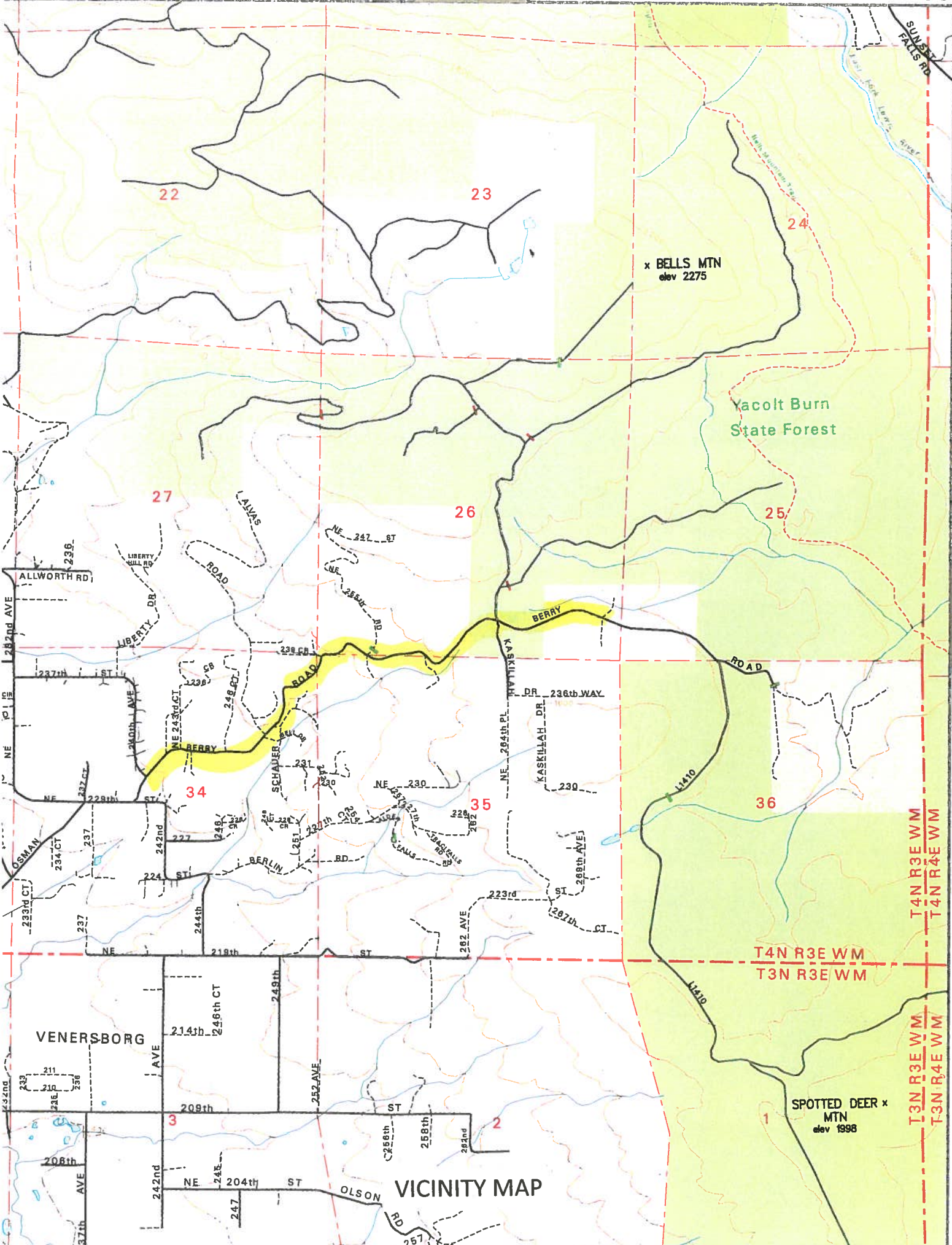
From traffic safety and operations point of view, a large truck with trailer travelling at a slow speed occupies approximately 11.5 feet when negotiating a curve alignment of 300 feet and approximately 13.5 feet when negotiating a curve of 150 feet radius (representing a sharp curve). The space occupied by the truck takes into account the off-tracking and the swept path of the truck.

1. Given that there would need to be certain shy distance or clearance between the guardrail and the vehicle and clearance between opposing vehicles the lane available width is inadequate and the corridor would be unsuitable for gravel truck traffic.
2. The lack of available line of sight, especially at sharp curves, between approaching vehicle further adds to the corridor's unsuitability for heavy truck traffic from traffic safety and operations point of view.
3. The corridor is on continuous downhill grade from the DNR land until it reaches 240<sup>th</sup> Avenue. This would require continuous braking action on part of the loaded gravel trucks which in turn would destroy the pavement. Because of the length of the corridor that the loaded trucks will have to trek downhill, it is very likely that drivers will try to conserve on the mechanical braking system and use engine compression to control speed. This will generate loud noise and complaints from the area residents.

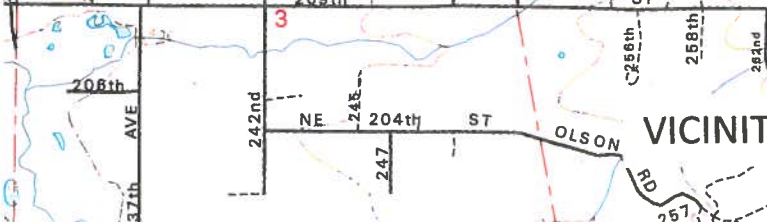
CC: Matt Griswold, P.E.; -Traffic Engineering Manager



5. Berry Rd: NE 229th Ave to DNR.					
	54640 @ 0.00		Intersection with NE 229th St.		
	54640 @ 0.90		Intersection with NE 240th Ave.		
	54640 @ 0.40		Intersection with NE 246th Ct.		
	54640 @ 1.61		Intersection with NE Kaskillah Rd		
	54640 @ 2.54		End of County Rd		
Report No	Road No	MilePost	CollisionDate	# of Injuries	Inj Class
E184813	54640	0.01	8/1/2012 15:37	0	1 - No Injury
2737885	54640	0.26	2/26/2010 7:15	0	1 - No Injury
E155883	54640	1.11	2/25/2012	0	1 - No Injury
3352692	54640	1.89	2/1/2010 12:16	1	6 - Non Disabling



VICINITY MAP



T4N R3E WM  
 T4N R4E WM

T4N R3E WM  
 T3N R3E WM

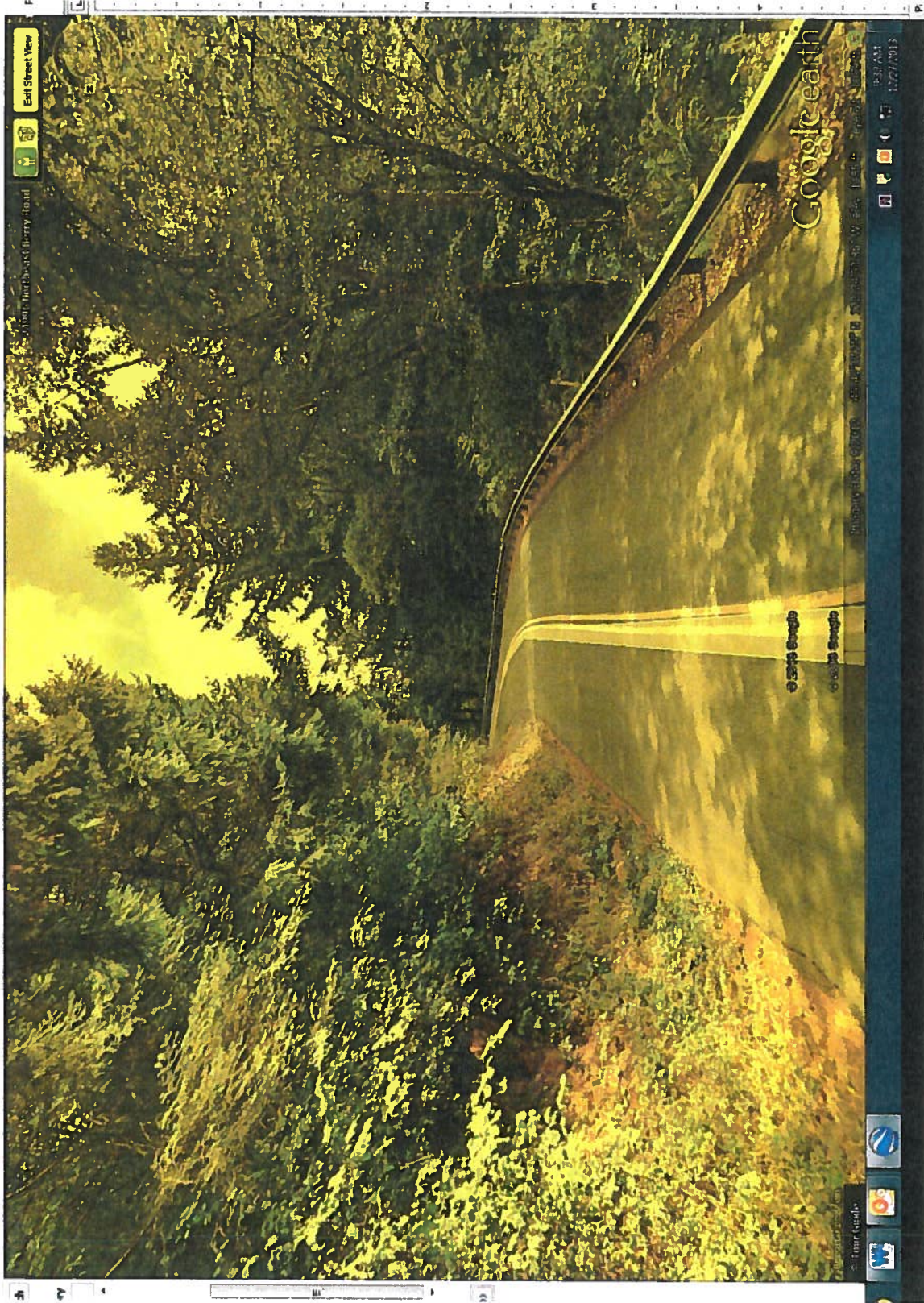
T3N R3E WM  
 T3N R4E WM



Berry Road 250 feet east of NE 240<sup>th</sup> Avenue- Looking East



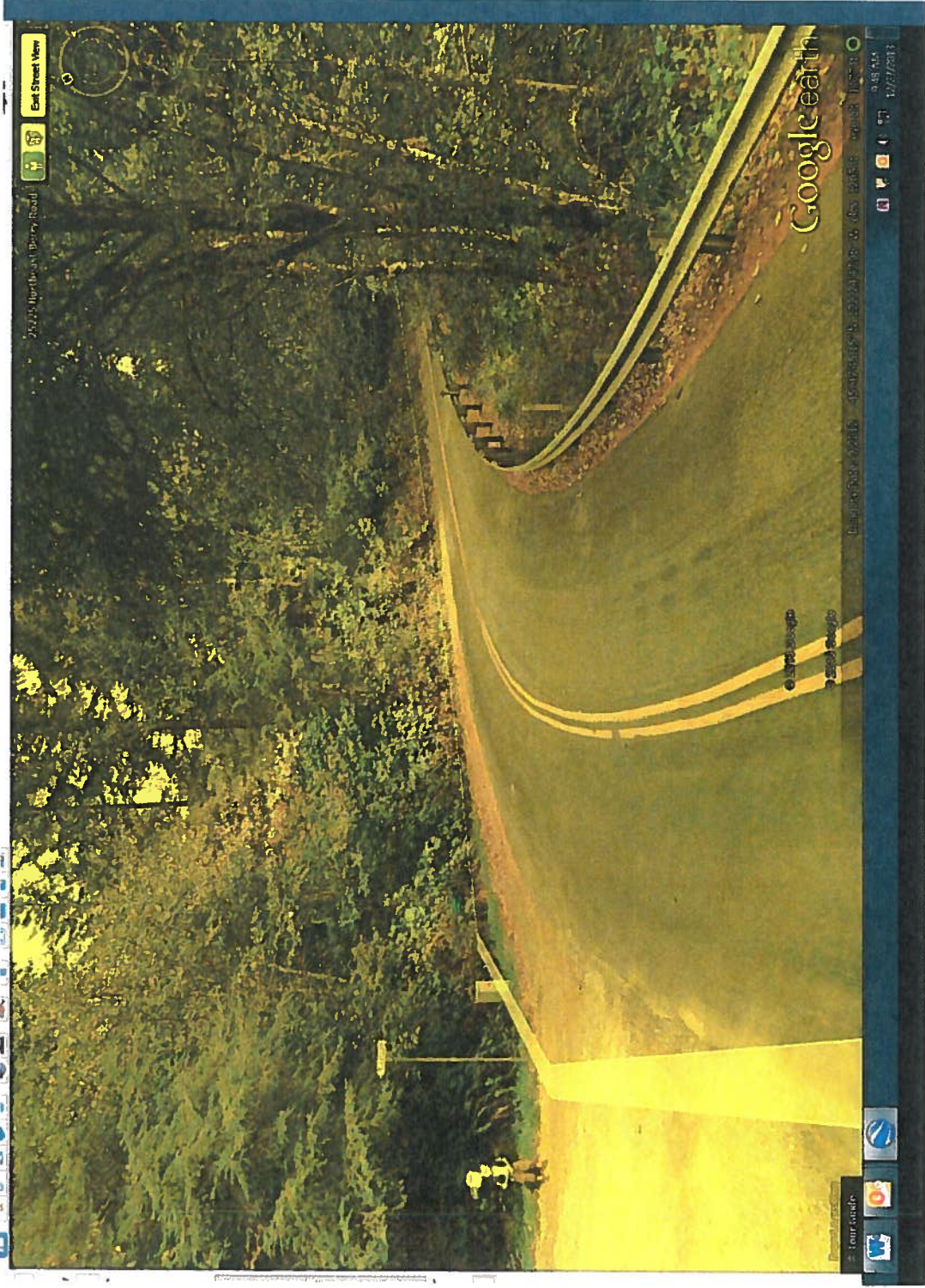
Berry Road 700 feet east of Bell Drive



Berry Road – Approximately 900 feet east of Bell Road- Looking East



Berry Road approaching 239<sup>th</sup> Circle



Berry Road at 239<sup>th</sup> Circle- Looking East- Another example of tight horizontal curve combined with roadway grade and sight distance deficiency.



Berry Road at NE 239<sup>th</sup> Circle.- Looking east





Berry Road- 170 feet east of 239<sup>th</sup> Circle- Looking East



Guardrail swiped by passing vehicle



Berry Road East of Kaskillah