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EXPIRES: 06/30/2013

Screening Assessment Report

Newberry National Volcanic Monument
Oregon
6 July 2011

SGH Project 117165.00

SIMPSON GUMPERTZ & HEGER

Engineering of Structures and Building Enclosures

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SIMPSON GUMPERTZ & HEGER
Engineering of Structures
and Building Enclosures

6 July 2011

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Project 117165.00 - Screening Assessment of Buildings and Bridge at Newberry National Volcanic Monument, Oregon

Subject: Transmittal of Screening Assessment Report

Dear Dr. Cladouhos:

Please find attached our report describing the results of our screening assessment of selected buildings and a bridge at the Newberry National Volcanic Monument in Oregon. The attached report describes our findings and recommendations.

It has been a pleasure working with you on this important project. Please feel free to contact us if you have any questions or comments.

Sincerely yours,

Stephen K. Harris, Principal
OR License 83389 P.E.

Craig B. Goings, Staff Consultant
CA License 4015 S.E.

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EXECUTIVE SUMMARY

Simpson Gumpertz & Heger performed a seismic screening assessment of selected buildings and a bridge at the Newberry National Volcanic Monument in Oregon (NNVM). AltaRock is interested in determining how the buildings and bridges will respond to shaking caused by seismic events induced by injection at a geothermal well approximately 3 km away.

Our assessment of the buildings followed FEMA 154-02 handbook, *Rapid Visual Screening of Buildings for Potential Seismic Hazards*. Our assessment of the bridge considered the capacity of the existing walls and the sliding resistance of both the steel and concrete bridge. Our assessment of the cosmetic damage to both the buildings and bridge followed recommendations by Dowding in his book, *Construction Vibrations*, and by the U.S. Bureau of Mines Report of Investigation 8507.

Based on our analysis, the lowest PGA we compute for any one building that resulted in a 10% probability of collapse was 0.25 g. The 10% limit is consistent with the collapse probability of a new building designed to current code if an MCE occurs. The highest probability of collapse for a 0.10 g PGA event is 1.2 %.

We recommend limiting the peak velocity at the buildings we reviewed on site to 20 mm/sec or lower to minimize the potential for cosmetic damage to the buildings. This correlates with an approximate peak ground acceleration of 0.025 g. As a result, the trigger levels of PGA = 0.014, and 0.028 g are appropriate to protect against damage to the building finishes. Since the Paulina Creek Bridge is in poor condition, we recommend a threshold limit of 125 mm/sec to limiting cosmetic damage to the bridge including expansion of the existing cracks. This correlates with an approximate peak ground acceleration of 0.15 g. We also recommend installing crack monitors on the bridge to confirm these recommended limits during well injection.

T A B L E O F C O N T E N T S

Letter of Transmittal

EXECUTIVE SUMMARY

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SCREENING ASSESSMENT OF
BUILDINGS AND BRIDGES
AT NEWBERRY NATIONAL VOLCANIC MONUMENT
OREGON

1. INTRODUCTION

1.1 Background

AltaRock Energy, Inc. (AltaRock) retained Simpson Gumpertz & Heger (SGH) to perform seismic screening of selected buildings and a bridge at the Newberry National Volcanic Monument in Oregon (NNVM). AltaRock is interested in determining how the buildings and bridges will respond to shaking caused by seismic events induced by injection at a geothermal well approximately 3 km away. This information will be used to provide the U.S. Forest service with estimates of the potential for damage and/or collapse of the buildings and bridge at NNVM.

1.2 Objective

AltaRock is interested in determining how the injection process at the geothermal well will impact the buildings and bridge structure. In particular, AltaRock would like to determine the following:

1. The potential for any damage at the levels of shaking corresponding to trigger levels (PGA=0.014, and 0.028 g).
2. The potential for any damage at the shaking level (PGA=0.1 g) modeled for the largest potential seismic event.
3. Threshold shaking levels for cosmetic damage and structure collapse.

1.3 Scope of Work

The scope of work included the following:

1. Conducted a site visit to observe each structure's construction. The site visit consisted of a rapid visual observation of each structure and did not include a detailed survey.
2. Performed seismic screening of the structures utilizing the national standard document, FEMA 154, Rapid Visual Screening of Buildings for Potential Seismic Hazards: A

Handbook. We utilized the screening results to estimate the collapse potential of each structure and correlated the collapse potential to a ground motion level.

3. Utilized construction vibration standards to estimate vibration levels that would cause various levels of cosmetic damage to the building finishes. The results are tabulated in terms of the peak particle velocity that will cause a given damage state.

1.4 Structures in Scope

There are many structures located on the NNVM site. Our scope of work included a review of representative structures selected by the U.S. Forest Service. The structures are located at five areas on the NNVM site including the Paulina Lake Outlet, The Paulina Lake Resort, The Paulina Lake Guard Station, the Newberry Group Camp Ground (Odd Fellows Campground), and the East Lake Resort. Figure 1 shows the approximate location of each of these areas.

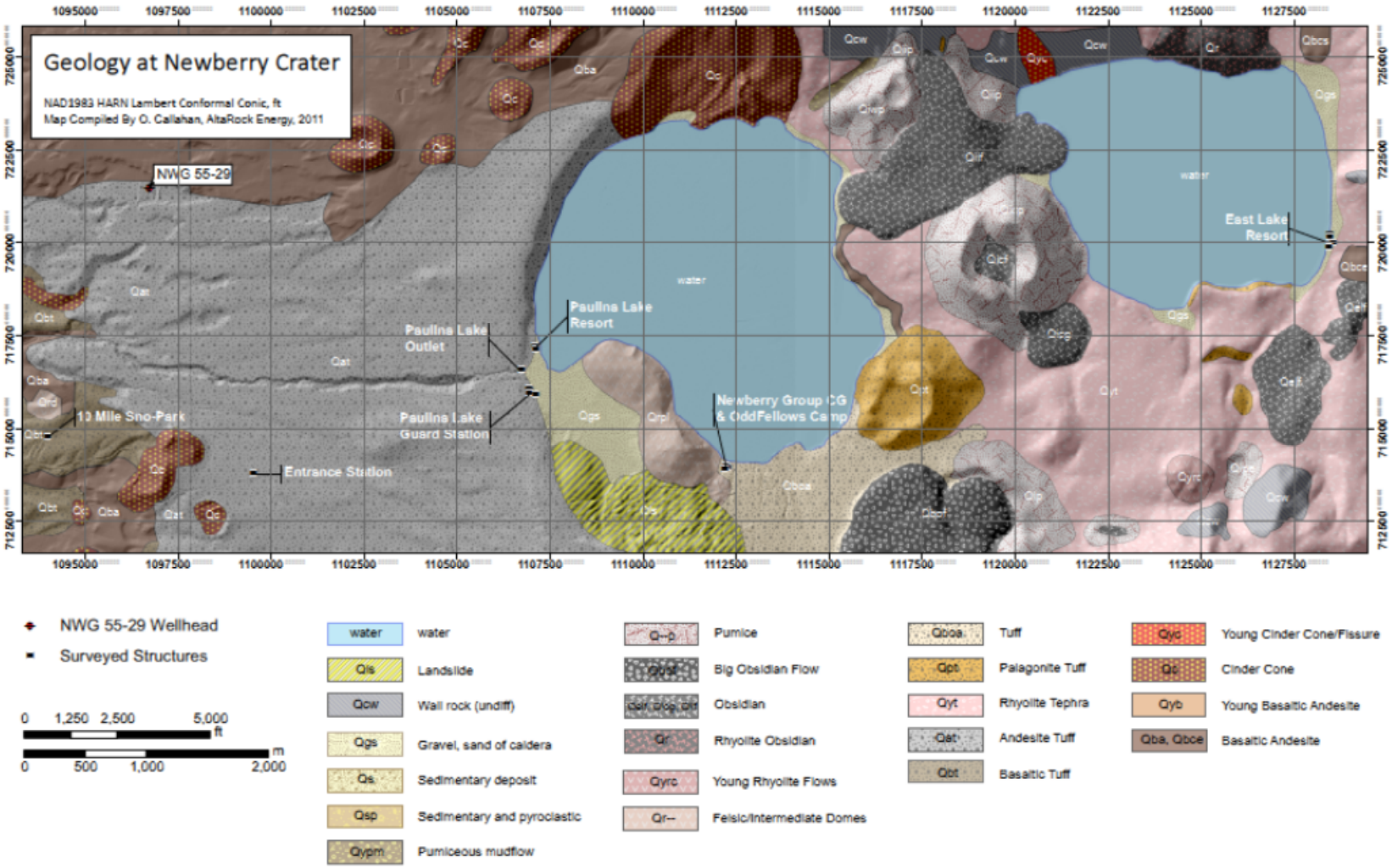


Figure 1 Locations of selected structures at NNVM

Within each of these five areas, we reviewed various representative buildings. Table 1 provides a listing of the buildings within each area that are included in our scope of work.

Table 1 Structures

Site Name	Building
10 Mile Sno-Park	Snow Shelter
Newberry Group CG (Odd Fellows Camp)	Cabin 1
	Cabin 2
Paulina Creek Outlet	Paulina Creek Bridge
Paulina Lake Guard Station	Visitors Center & Guard Station
	Wash House
	Crew House
Paulina Lake Resort	Lodge
	Reeds 1
East Lake Resort	Store/Café
	Wood Duck Cabin
	Teal Cabin
Entrance Station	Kiosk

1.5 Description of Structures

1.5.1 Buildings

The building structures all consist of wood frame construction. AltaRock did not provide building drawings for our review. Section 3 below provides a brief description of each building based on our observations made during our site visit. Figures 2 through 13 are photos of each building.

Figure 2 10 Mile Sno-Park Snow Shelter

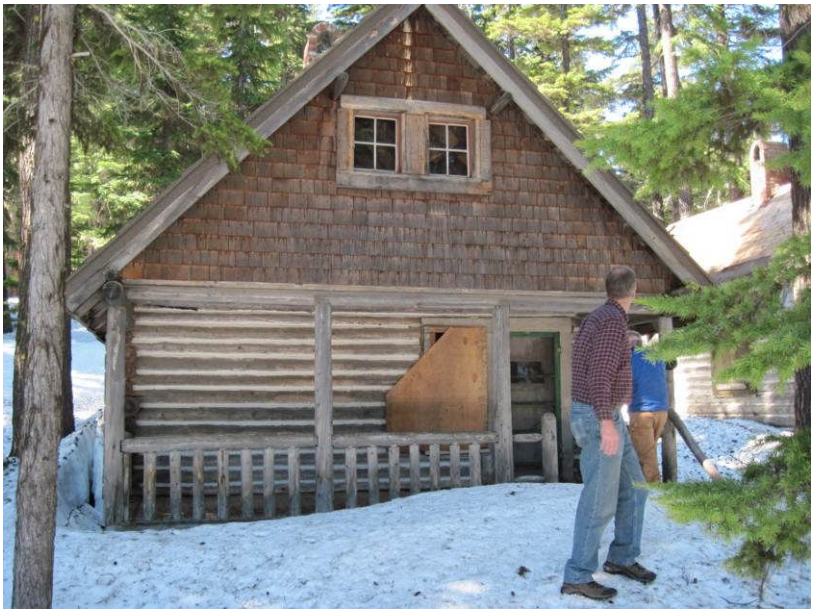


Figure 3 Newberry Group CG (Odd Fellows Camp) Cabin 1

Figure 4 Newberry Group CG (Odd Fellows Camp) Cabin 2

Figure 5 Paulina Lake Guard Station Visitors center & Guard Station

Figure 6 Paulina Lake Guard Station Wash House

Figure 7 Paulina Lake Guard Station Crew House

Figure 8 Paulina Lake Resort Lodge

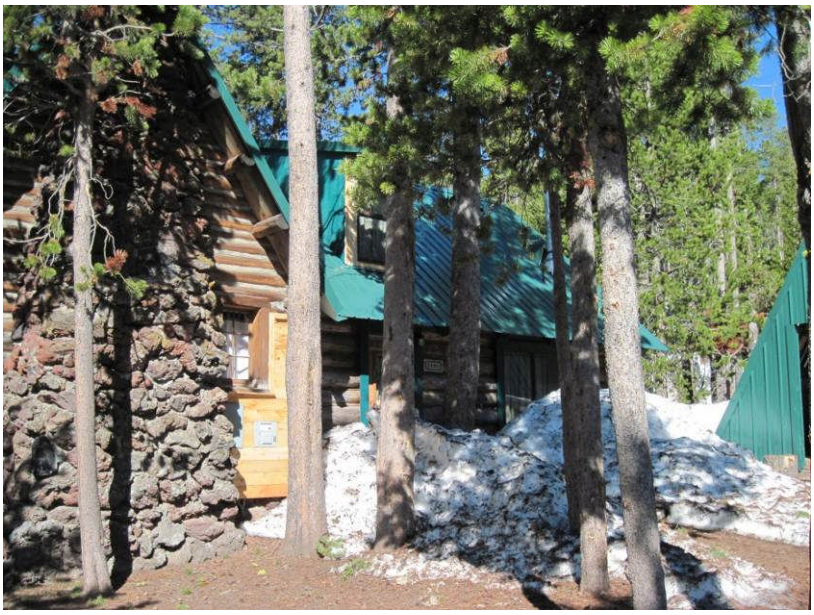


Figure 9 Paulina Lake Resort Reeds 1

Figure 10 East Lake Resort Store/Café

Figure 11 East Lake Resort Wood Duck Cabin

Figure 12 East Lake Resort Teal Cabin

Figure 13 Entrance Station Kiosk

1.5.2 Bridge

The Paulina Creek Bridge structure consists of a steel “Hamilton EZ Bridge” constructed on top of an existing concrete bridge, see Figure 14. The steel bridge was added circa 2008. We reviewed the drawings for the concrete portion but no drawings are available for the steel portion. The concrete portion was designed circa 1952. It consists of a three-span concrete

bridge. The abutments are diaphragm type and are cast monolithically with the concrete bridge deck. The two interior bridge pier walls are concrete, also cast monolithically with the bridge deck. The bridge deck at the first and third spans consists of solid arched-concrete slabs spanning from the abutments to the pier walls. The second span consists of a solid concrete slab. The original concrete bridge includes concrete railings. The concrete bridge was constructed along an existing concrete dam. There are no drawings available for the concrete dam.

Figure 14 Paulina Creek Bridge

The steel bridge consists of four longitudinal steel girders, spanning from the original north to south concrete bridge abutments. Wood blocks support the steel girders above the original concrete bridge diaphragm abutments, see Figure 15. Additional wood blocks support the girders off the concrete bridge deck just inboard from each abutment. There was no connection visible between the steel girders and the wood blocks or between the wood blocks and the concrete bridge, except that there are steel angle bumpers provided at the inboard wood blocks.

Steel channel end and intermediate vertical diaphragms brace the steel girders. In addition, horizontal steel angles provide a horizontal truss that braces the girder top flanges.

Figure 15 Wood block support of bridge girders

2. INFORMATION FROM OTHERS

2.1 Structural Drawings

Structural and architectural drawings were not available for any of the building structures. We did review a listing of the buildings and bridges from the document titled "Forest Service Comments on Alta Rock's Induced Seismicity Mitigation Plan, April 4, 2011" dated 16 May 2011. The list contained in this document included the approximate year of construction for most buildings.

We reviewed the available structural drawings for the original concrete Paulina Creek Bridge. The drawings are titled "Paulina Creek Bridge" and consist of two sheets dated some time in 1950. The actual date is illegible.

2.2 Seismic Site Class

Treadwell and Rollo provided us with their estimate of the site class for NNVM. The Paulina Creek Bridge is located on fairly competent rock and is therefore classified as Site Class B.

2.3 Seismic Hazards

We obtained information on the likely intensity of future earthquake shaking at the site from the United States Geologic Survey's national seismic hazard maps, as maintained on the USGS web site at www.USGS.gov. Specifically, we used the gridded national seismic data associated with the ASCE Standard 7-05 Minimum Design Loads for Buildings and Other Structures provisions.

3. FIELD OBSERVATIONS

Craig Goings of Simpson Gumpertz & Heger conducted visual inspections of the buildings and Paulina Creek Bridge on 9 June 2011. Table 2 following describes the basic construction of each building and observations we made during our site visit.

Table 2 Field observations for each structure

Structure	Structure Type	Observations
10 Mile Sno-Park - Snow Shelter	Single story log cabin.	Photos in the building show the construction sequence. The building is founded on a concrete slab and foundation. Structure is in good condition.
Newberry Group Camp Ground - Cabin 1	One story log cabin with loft.	The foundations consist of mortared stone. We observed wood decay in the lower log members. There is a large brick fire place on the south side. The top of the brick chimney is in poor condition. There is also a wood stove with brick chimney in the building interior.
Newberry Group Camp Ground - Cabin 2	One story log cabin with loft.	The foundations consist of mortared stone. We observed wood decay in the lower log members. There is a large brick fire place on the south side. There is also a wood stove with brick chimney in the building interior.
Paulina Creek Bridge	Steel "Hamilton EZ Bridge" constructed on top of the original reinforced concrete bridge. The steel bridge consisted of four longitudinal girders spanning between the north and south abutments of the original concrete bridge. The bridge deck consists of timber sheathing.	The steel bridge was in good condition. The concrete bridge was in poor condition including large horizontal cracks at the west face. There were abandoned crack monitors spanning the cracks. The bridge acts as an approximately four foot high dam.
Paulina Lake Guard Station - Visitors Center	One story wood frame.	The building has concrete foundations. The interior walls are sheathed with wood paneling.

Structure	Structure Type	Observations
Paulina Lake Guard Station - Wash House	One story wood frame.	The building has concrete foundations. The interior is sheathed with wood paneling except the ceiling.
Paulina Lake Guard Station - Crew House	Two story wood frame.	The building has concrete foundations. There is a concrete masonry unit chimney at the building center. The interior walls are sheathed with either plaster or gyp-board.
Paulina Lake Resort - Lodge	Two story log cabin.	The foundations consist of mortared stone. There was a recent one story addition to the east side. We observed wood decay in the lower log members.
Paulina Lake Resort - Reeds Cabin	One story cabin with loft.	The foundations consist of mortared stone. We observed wood decay in the lower log members. There is a large stone fire place on the west side.
East Lake Resort - Store Café	One story wood frame.	The building has concrete foundations.
East Lake Resort - Wood Duck Cabin	One story wood frame.	The building has concrete foundations. The concrete is decaying at the north west building corner. The interior walls are sheathed with wood paneling.
East Lake Resort - Teal Cabin	One story wood frame.	The building has concrete foundations. The interior walls are sheathed with tongue and grooved wood paneling.
Entrance Station	Single story wood frame construction.	Structure is in good condition.

4. STRUCTURAL CALCULATIONS

4.1 Building Collapse Potential

We utilized the rapid screening procedures contained in FEMA 154-02, *Rapid Visual Screening of Buildings for Potential Seismic Hazards* to determine the collapse probability for the building structures. The screening procedures contained in FEMA 154 entail performing a rapid visual screening of each building. The screening procedure includes a rating form that includes a series of questions keyed to deficiencies common to specific model building types. The FEMA 154 forms consider a limited number of deficiencies and are missing key deficiencies for the buildings at the NNVM site. We therefore customized the FEMA 154 forms with additional deficiencies to choose from. This will result in a more realistic and conservative result. Table 3 summarizes common deficiencies we added to the standard FEMA 154 form.

Table 3 Common building deficiencies added to FEMA 154 form

Deficiency
No redundancy
Mass irregularity
Short column
Weak column concrete
Wood deterioration
Poor wall anchorage
Poor load path
No cripple wall bracing
Lacks sill anchors
Unreinforced chimney
Pre-Code

The FEMA 154 screening forms include a scoring system for three different seismic hazards: High, Moderate and Low. The FEMA 154 scoring system relates the building's probability of collapse to a given level of earthquake shaking. In order to determine the appropriate hazard forms to use for the NNVM site, we obtained the site MCE ground motion data utilizing a web-based applet published by the USGS (version 5.1.0, dated 10 February 2011). We conservatively assumed a site class C for the NNVM site as input to this applet. Table 4 presents the key spectral response acceleration parameters we calculated for the site for MCE shaking.

Table 4: Earthquake Ground Motion Data Obtained from USGS Software

Parameter	Value
S_s	0.43 g
S_1	0.18 g
Site Class	C
F_a	1.2
F_v	1.6
$S_{MS} = S_S F_a$	0.5 g
$S_{M1} = S_1 F_v$	0.3 g
MCE PGA	0.2 g

Based on the value of S_{MS}, the site is just at the upper limit of the moderate seismic hazard range defined in FEMA 154. As a result, we utilized the moderate seismic hazard forms contained in FEMA 154 as the basis for our screening. We also utilized the FEMA 154 forms to estimate the probability of collapse for each building at various peak ground acceleration (PGA) shaking levels in order to arrive at the ground shaking that would result in an estimated 10% probability of collapse. The 10% probability of collapse is consistent with the collapse probability of a building designed to the current building code for an MCE. For this computation, we utilized both the High and Moderate seismicity forms from FEMA 154 in order to interpolate an expected PGA that resulted in a 10% probability of collapse. Table 5 presents the results of our screening analysis. The results include the probability of collapse for each building utilizing the Moderate seismicity forms from FEMA 154 and the approximate site PGA corresponding to a collapse probability of 10%. The FEMA 154 Moderate seismicity form is based on a lower bound PGA of approximately 0.1 g. The maximum collapse probability for all the buildings at this level of shaking is 1.2%. The lowest PGA resulting in a 10% probability of collapse is 0.25 g.

Table 5 Results of FEMA 154 screening

Structure	FEMA 154 Moderate Seismicity Collapse Probability	PGA resulting in 10% probability of collapse

10 Mile Sno-Park - Snow Shelter	0.1%	0.45 g
Newberry Group Camp Ground - Cabin 1	1.2%	0.25 g
Newberry Group Camp Ground - Cabin 2	1.2%	0.25 g
Paulina Lake Guard Station - Visitors Center	0.4%	0.35 g
Paulina Lake Guard Station - Wash House	0.1%	0.45 g
Paulina Lake Guard Station - Crew House	0.1%	0.45 g
Paulina Lake Resort - Lodge	1.2%	0.25 g
Paulina Lake Resort - Reeds Cabin	1.2%	0.25 g
East Lake Resort - Store Café	0.1%	0.45 g
East Lake Resort - Wood Duck Cabin	0.1%	0.45 g
East Lake Resort - Teal Cabin	0.1%	0.45 g
Entrance Station	<0.1%	1.1 g

4.2 Building Cosmetic Damage Potential

We utilized published data on the potential for cosmetic damage to building finishes due to construction vibrations to estimate the potential cosmetic damage due to the proposed injection operations. In particular, we utilized data provided in *Construction Vibrations* by Charles H. Dowding. In this reference, the definition of threshold for cosmetic damage is “loosening of paint and small plaster cracks at joints between construction elements.” We used this definition of threshold damage to define the injection threshold levels that will initiate cosmetic damage to the building finishes. The threshold data provided by Dowding is based on studies done by various investigators including the U.S. Bureau of Mines. Cosmetic damage threshold levels

presented by Dowding are applicable to interior or exterior finishes consisting of plaster wall construction. Dowding summarizes the cosmetic cracking thresholds in terms of the measured peak particle velocity at the building. The studies considered sensors placed either on the structure or in the ground near the structure. The applicable study results indicate that the threshold for cracking of plaster finishes range from a peak particle velocity of 61 to 300 mm/sec. The U.S. Bureau of Mines (USBM) Report of Investigation 8507 provides guidance on the recommended peak particle velocity threshold for cracking. In that investigation, the recommended peak particle velocity thresholds vary with the blast frequency. For frequencies above 3 hz, the limit is approximately 20 mm/sec.

4.3 Paulina Creek Bridge Calculations

4.3.1 Concrete Bridge

We performed structural calculations to determine the existing capacity of the concrete lower portion of Paulina Creek Bridge. The calculations considered the shear capacity of the three concrete piers for loading in the transverse direction. The calculations also included the longitudinal bridge capacity assuming the soil pressure behind the bridge abutment walls resist the longitudinal bridge motion.

Since the existing bridge is in poor condition, we assumed a low concrete compressive strength to calculate the bridge shear capacity. The ASCE 41-06 Standard, *Seismic Rehabilitation of Existing Buildings*, provides default lower bound concrete strengths for various construction time frames. ASCE 41 provides a default lower bound concrete strength for the 1950-1969 time frame of 2,500 psi. Given the poor existing concrete condition, we assumed a concrete compressive strength of 1,500 psi. ASCE 41 also provides default lower bound strength for steel reinforcing. We assumed a default lower bound strength of 40,000 psi for the reinforcing steel. Given the poor existing bridge condition, we conservatively assumed a 50% section loss of the existing reinforcing steel.

Based on our review of the existing details, the limiting capacity for transverse bridge loading is the shear capacity of the concrete pier walls. We arrived at this conclusion given the low aspect ratio of the wall and the fact that the wall is doweled into the existing rock subgrade. We compute the nominal shear capacity of the pier walls to be 331 kips and 156 kips for the connection of the wall to the existing rock. We computed the dynamic (convective and impulsive) and hydrostatic effects of the retained lake water acting on the concrete dam wall.

The dynamic effects of the retained water are dependent on the level of shaking while the static effects are not. We computed the required peak ground acceleration that results in a bridge pier shear of 156 kip including the bridge weight, hydrostatic water pressure and dynamic water pressures. The resulting peak ground acceleration is 0.28 g.

For longitudinal loading, the diaphragm abutment backwall soil pressure resists the seismic bridge. The California Department of Transportation (Caltrans) has performed testing on the allowable back wall pressure that can be used to resist seismic loading. We used the Caltrans criteria for back wall pressure of 7.7 ksf reduced by the factor of $(7/8)^2$ to account for the existing abutment wall height of 7 ft. We calculated the nominal flexural and shear capacity of the backwall required to resist the induced soil pressure. We determined that the backwall shear capacity is the limiting factor. We computed that a peak ground acceleration of 0.7 g will result in seismic forces in the backwall that equal the backwall's nominal capacity.

4.3.2 Steel Bridge

Based on our field observations, the wood blocks support the steel girders on top of the concrete bridge. There is no positive connection between the steel girders and the concrete bridge. The limiting capacity for lateral loads is therefore the sliding capacity of the steel on the wood blocks. Based on this, the peak ground acceleration to cause sliding of the bridge is approximately 0.3 g.

4.4 Bridge Cosmetic Damage Potential

We utilized published data on the potential for cosmetic damage to concrete finishes due to construction vibrations to estimate the potential cosmetic damage to the Paulina Creek Bridge due to the proposed injection operations. In particular, we utilized data provided in *Construction Vibrations* by Charles H. Dowding. In this reference, the defined threshold for cosmetic damage is hair line cracking of concrete. We used this definition of threshold damage to define the injection threshold levels that will initiate cosmetic damage to the bridge. The threshold data provided by Dowding is based on a study done in 1977. Dowding summarizes the cosmetic cracking thresholds in terms of the measured peak particle velocity at the structure. The study considered sensors placed on the structure. The applicable study results indicate that the threshold for cracking of concrete is 254 mm/sec.

5. DISCUSSION

5.1 Building Collapse Potential

We utilized FEMA 154 screening forms to determine the collapse potential for the buildings on the NNVM site. In particular, we utilized the FEMA 154 screening forms to estimate the required PGA to cause a 10% chance of collapse to each building. The 10% probability of collapse is consistent with the collapse probability of a building designed to the current building code for an MCE. It is our opinion that this is an appropriate collapse probability to use as a measure for the required PGA that would cause collapse of the buildings we reviewed on the NNVM site.

We also utilized FEMA 154 screening forms to estimate the collapse probability for the buildings at the site for seismic shaking of 0.1 PGA. For this computation, we utilized the Moderate Seismicity form contained in FEMA 154.

The types of building deficiencies we observed and included in our FEMA 154 analysis included decayed wood and the presence of unreinforced masonry chimneys. Based on the era of construction, we assumed that most of the buildings also lack sill to foundation bolts. However, although we were not able to confirm the lack of sill bolting, we made the conservative assumption that sill bolting does not exist.

5.2 Building Cosmetic Damage Potential

We utilized published data to estimate the levels of peak particle velocity thresholds that will result in cosmetic damage to the building structures. The peak particle velocity data is based on building structures that have interior plaster or gypsum board sheathed walls. Selected buildings we reviewed have this type of sheathing. Other buildings have either wood paneling or exposed log construction. Based on information presented in the Dowding document, finishes such as wood paneling would likely be damaged at higher peak particle velocities than those required to damage plaster or gypsum board sheathed walls. As a result, it is our opinion that utilizing the damage threshold levels for the plaster or gypsum board sheathed walls will yield a conservative estimate of the damage for other interior finishes such as wood paneling.

Based on the information presented in the Dowding document, it is our opinion that the appropriate threshold level for cosmetic damage should be based on a measured peak particle

velocity in lieu of a peak ground acceleration. In addition, the peak particle velocity limits provided by the USBM should be used.

5.3 Paulina Creek Bridge Calculations

The original concrete Paulina Creek Bridge is in poor condition as we observed during our site visit. The concrete bridge was partially replaced by a new steel bridge supported by the abutments of the original concrete bridge. Since the concrete bridge is being used to support the steel bridge, collapse or failure of the concrete bridge will impact the stability of the steel bridge. As a result, we computed capacities of both bridges based on the information shown on the existing concrete bridge drawings and field observations of the steel bridge. Based on our computations, the concrete bridge is most vulnerable to lateral forces in the transverse direction. This is mostly due to the additional seismic forces related to the retained lake water. The limiting existing capacity for the concrete bridge is the connection of the bridge piers to the supporting rock. The connection consists of steel dowels drilled and grouted into the rock. Failure of these dowels will result in sliding of the concrete bridge. Although it is our opinion that the sliding will not result in collapse of the bridge, we feel that it is a limiting factor in the serviceability of the bridge.

The steel bridge is supported from the concrete bridge by wood blocks. We did not observe any positive connection between the steel bridge and the wood blocks or the wood blocks and the concrete bridge. As a result, the limiting capacity for sliding is the sliding resistance of the steel girders on the wood blocks. Once sliding occurs, there is a possibility that the movement will cause one or more of the girders to become unseated. The result of unseating a girder will be that the bridge girder will drop approximately 6 in. to the concrete bridge deck. Although we do not believe that this is a serious concern, we feel that it is a limiting factor in the serviceability of the bridge.

5.4 Bridge Cosmetic Damage Potential

Given the poor condition of the concrete bridge, the bridge is more vulnerable to cosmetic damage from seismic shaking. We utilized the cosmetic damage thresholds presented by Dowding for concrete walls to estimate the cosmetic damage limits for the bridge. However, since the existing bridge currently has large open cracks, it is our opinion that the threshold limits presented by Dowding for concrete cracking are un-conservative for this bridge for

assessing increased opening of the existing cracks. The Dowding values are appropriate for new cracking.

6. CONCLUSIONS

6.1 Building Collapse Potential

Based on the results of our FEMA 154 screening process, we estimated the seismic peak ground acceleration that will result in a 10% probability of collapse. The results vary by building depending on the types of deficiencies we observed. Table 6 presents our conclusions regarding the PGA level that will result in a 10% probability of collapse. The lowest PGA we computed for any one building that resulted in a 10% probability of collapse was 0.25 g.

Table 6 PGA required to reach a 10% probability of collapse of reviewed buildings.

Structure	PGA resulting in 10% probability of collapse
10 Mile Sno-Park - Snow Shelter	0.45 g
Newberry Group Camp Ground - Cabin 1	0.25 g
Newberry Group Camp Ground - Cabin 2	0.25 g
Paulina Lake Guard Station - Visitors Center	0.35 g
Paulina Lake Guard Station - Wash House	0.45 g
Paulina Lake Guard Station - Crew House	0.45 g
Paulina Lake Resort - Lodge	0.25 g
Paulina Lake Resort - Reeds Cabin	0.25 g
East Lake Resort - Store Café	0.45 g
East Lake Resort - Wood Duck Cabin	0.45 g
East Lake Resort - Teal Cabin	0.45 g
Entrance Station	1.1 g

Based on the results of our FEMA 154 screening process, we estimated the collapse probability for the buildings we reviewed based on a PGA of 0.1 g. The results vary by building depending on the types of deficiencies we observed. Table 7 presents our estimate of the collapse probability for an earthquake with a PGA of 0.1 g. The highest probability of collapse we computed for the buildings we reviewed was 1.2 %.

Table 7 Collapse probability for 0.1 PGA shaking

Structure	FEMA 154 Moderate Seismicity Collapse Probability
10 Mile Sno-Park - Snow Shelter	0.1%
Newberry Group Camp Ground - Cabin 1	1.2%
Newberry Group Camp Ground - Cabin 2	1.2%
Paulina Lake Guard Station - Visitors Center	0.4%
Paulina Lake Guard Station - Wash House	0.1%
Paulina Lake Guard Station - Crew House	0.1%
Paulina Lake Resort - Lodge	1.2%
Paulina Lake Resort - Reeds Cabin	1.2%
East Lake Resort - Store Café	0.1%
East Lake Resort - Wood Duck Cabin	0.1%
East Lake Resort - Teal Cabin	0.1%
Entrance Station	<0.1%

Based on the probability of collapse we computed for ground shaking of 0.1 g, we estimate the collapse potential for AltaRock's proposed trigger levels of PGA=0.014, and 0.028 g to be less than 0.5%.

6.2 Building Cosmetic Damage Potential

Based on the data presented by Dowding, we determined the peak velocity levels that will initiate cosmetic damage to the finishes within the buildings we reviewed at the NNVM site. Based on our observations and the data presented by Dowding, the peak velocity levels thresholds for cosmetic damage of the finishes vary from 60 to 300 mm/sec. The USBM recommends limiting the peak particle velocities based on blasting frequency. The limit recommended by the USBM for blasting frequencies above 3 hz is 20 mm/sec. Since the buildings on site have natural frequencies above 3 hz, it is our opinion that the USBM criteria are applicable. Dowding and USBM do not provide guidance on relating the peak particle velocity limits to a peak ground acceleration limits. However, the USGS does provide a correlation between peak ground acceleration and peak velocity used to develop ShakeMaps.

We will use this correlation in order to provide a rough estimate of the peak ground acceleration. However, the peak particle velocity measure is a better indicator of expected building cosmetic damage.

6.3 Paulina Creek Bridge Calculations

The Paulina Creek Bridge consists of both an older concrete bridge that also supports a newer steel bridge. Table 8 summarizes the structural capacity that limits the ability of the bridge to resist lateral forces in terms of the peak ground acceleration required to reach the limiting capacity. Based on the results of our computations, the limiting capacity is the transverse sliding of the bridge piers with a resulting capacity of 0.28 g.

Table 8 Limiting capacities of the bridge related to PGA

Structural Component	PGA limit
Transverse sliding of the bridge piers	0.28 g
Longitudinal shearing of the bridge abutment wall	0.7 g
Sliding of the steel bridge on the wood blocks	0.3 g

6.4 Bridge Cosmetic Damage Potential

Based on the data provided by Dowding, we determined the peak velocity levels that will initiate cosmetic damage to the Paulina Creek Bridge. Based on the data presented by Dowding, the peak velocity thresholds levels for cosmetic damage of concrete walls is approximately 250 mm/sec. Given the poor condition of the existing concrete bridge, peak velocity level thresholds for additional damage to the cracked portions are difficult to estimate. As a result, AltaRock should take necessary measures to monitor the existing bridge cracks during the injection process. This will allow AltaRock to monitor the condition of the concrete bridge during the injection process and modify the process or threshold levels as data becomes available.

7. RECOMMENDATIONS

7.1 Building Collapse Potential

Based on the results of our analysis, the collapse potential of the buildings we reviewed for AltaRocks proposed trigger levels of PGA=0.014, and 0.028 g are less than 0.5%. It is our opinion that this is an extremely low probability of collapse and represents a low risk during the injection process. We recommend that AltaRock use the proposed trigger levels during the injection process.

7.2 Building Cosmetic Damage Potential

Based on the data presented by Dowding and the USBM, we recommend limiting the peak velocity at the buildings we reviewed on site to 20 mm/sec or lower to minimize the potential for cosmetic damage to the buildings. This correlates with an approximate peak ground acceleration of 0.025 g. As a result, the trigger levels of PGA=0.014, and 0.028 g are appropriate to protect against damage to the building finishes.

7.3 Paulina Creek Bridge Serviceability

Based on the results of our analysis, the existing bridge capacity is well above the expected maximum level of acceleration expected at the bridge site. As a result, the trigger levels of PGA = 0.014, and 0.028 g are appropriate to protect against collapse of the bridge.

7.4 Bridge Cosmetic Damage Potential

Based on the data provided by Dowding, we determined the peak velocity levels that will initiate cosmetic damage to the Paulina Creek Bridge. Dowding presents a threshold limit of 254 mm/sec for concrete damage. Since the bridge is in poor condition, we recommend a threshold limit of 125 mm/sec to limiting cosmetic damage to the bridge including expansion of the existing cracks. This correlates with an approximate peak ground acceleration of 0.15 g. However, we also recommend that the existing cracks be monitored during the injection process in order to confirm that this limit is appropriate. The cracks can be monitored with standard crack monitor gauges that are manually read or with electronic monitors that can be read remotely. Once real injection data becomes available, we recommend revising the threshold limits as appropriate.

APPENDIX A

FEMA 154 Screening Forms

Rapid Visual Screening of Newberry National Volcanic Monument Site
Data Collection Form **Moderate Hazard**

Address: 43.715,-121.28
Zip: 97739
Other Identifiers:
No. Stories: 2
Year Built: Unknown
Screener: CBGoings
Date: 6/9/2011
Total Floor Area (sq. ft.):
Building Name: Paulina Lake Resort - Lodge
Use: Restaurant

Occupancy

☐ Assembly ☐ Research ☐ Office
☐ Hospital ☐ Retail ☐ Residential
☐ Emer. Services ☐ Industrial ☑ Restaurant
☑ <10 ☐ 11 to 100 ☐ 101 to 500 ☐ >500

Soil type

☐ A	☐ B	☑ C	☐ D	☐ E	☐ F
Hard Rock	Avg Rock	Dense Soil	Stiff Soil	Soft Soil	Poor Soil

Falling Hazards

☐ Unreinforced Chimneys ☐ Parapets ☐ Cladding ☐ Other

Form PGA: 0.1 Site PGA: 0.1 High form PGA: 0.2

BASIC SCORE, MODIFIERS, AND FINAL SCORE, S

BUILDING TYPE	W1 (<5000 SF)	W2 (> 5000 SF)	S1 (MRF)	S2 (BR)	S3 (LM)	S4 (RC SW)	S5 (URM INF)	C1 (MRF)	C2 (SW)	C3 (URM INF)	PC1 (TU)	PC2	RM1 (FD)	RM2 (RD)	URM
Basic Score	+5.2	+4.8	+3.6	+3.6	+3.8	+3.6	+3.6	+3.0	+3.6	+3.2	+3.2	+3.2	+3.6	+3.4	+3.4
Mid Rise (4 to 7 stories)			+0.4	+0.4		+0.4	+0.4	+0.2	+0.4	+0.4		+0.6		+0.6	
High Rise (> 7 stories)			+1.4	+1.4		+1.4	+0.8	+0.5	+0.8	+0.4		+0.6		+0.6	
Vertical Irregularity	-3.5	-3.0	-2.0	-2.0		-2.0	-2.0	-2.0	-2.0	-2.0		-1.5	-2.0	-1.5	-1.5
Plan Irregularity	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
No redundancy	-0.5	-0.6	-0.6	-0.6	-0.6	-0.6	-0.9	-0.6	-0.6	-1.0	-0.6	-0.7	-0.6	-0.6	-0.9
Mass irregularity	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.9	-0.6	-0.6	-1.0	-0.6	-0.7	-0.6	-0.6	-0.9
Short column	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-2.1	-1.9	-3.0	N/A	-1.7	N/A	N/A	N/A
Weak column concrete	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-2.1	-1.9	-3.0	N/A	-1.7	N/A	N/A	N/A
Wood deterioration	-0.5	-0.6	N/A	N/A	N/A	N/A	N/A	N/A	-0.4	N/A	N/A	N/A	-0.4	N/A	N/A
Poor wall anchorage	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-1.3	N/A	-1.2	N/A	-1.3	N/A	-0.9
Poor load path	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.9	-0.6	-0.6	-1.0	-0.6	-0.7	-0.6	-0.6	-0.9
No cripple wall bracing	-2.4	-1.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lacks sill anchors	-2.0	-1.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Unreinforced chimney	-0.6	-6.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pre-Code	N/A	-0.2	-0.4	-0.4	-0.4	-0.4	-0.2	-1.0	-0.4	-1.0	-0.2	-0.4	-0.4	-0.4	-0.4
Post-Benchmark	+1.6	+1.6	+1.4	+1.4		+1.2		+1.2	+1.6		+1.8		+2.0	+1.8	
Soil Type C	-0.2	-0.8	-0.6	-0.8	-0.6	-0.8	-0.8	-0.6	-0.8	-0.6	-0.6	-0.6	-0.8	-0.6	-0.4
Soil Type D	-0.6	-1.2	-1.0	-1.2	-1.0	-1.2	-1.2	-1.0	-1.2	-1.0	-1.0	-1.2	-1.2	-1.2	-0.8
Soil Type E	-1.2	-1.8	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6
Other	0	0	0	0	0	0	0	0	0	0	0	0	+0.5	0	0
Final Score, S	**+1.9**														

COMMENTS:

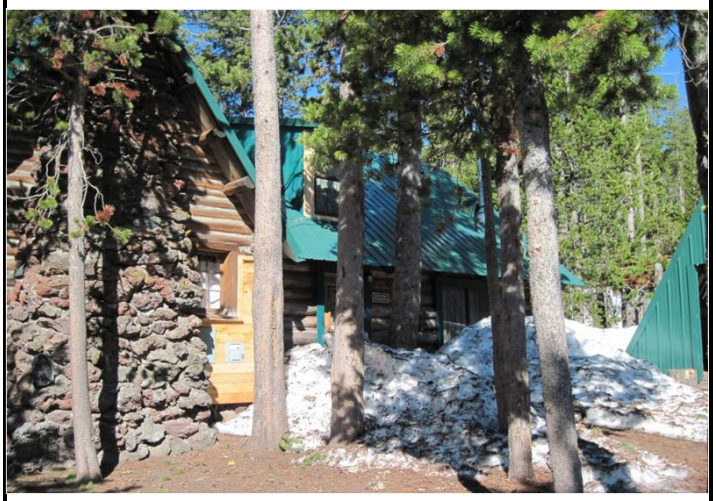
Design EQ Collapse Potential: 1%

Detailed Evaluation Recommended

☐ YES ☑ NO

Rapid Visual Screening of Newberry National Volcanic Monument Site
Data Collection Form **Moderate Hazard**

Address: 43.715,-121.28
Zip: 97739
Other Identifiers:
No. Stories: 2
Year Built: Unknown
Screener: CBGoings
Date: 6/9/2011
Total Floor Area (sq. ft.):
Building Name: Paulina Lake Resort - Reeds Cabin
Use: Housing



Occupancy

☐ Assembly ☐ Research ☐ Office
☐ Hospital ☐ Retail ☑ Residential
☐ Emer. Services ☐ Industrial ☐ Restaurant
☑ <10 ☐ 11 to 100 ☐ 101 to 500 ☐ >500

Soil type

☐ A Hard Rock ☑ B Avg Rock ☐ C Dense Soil ☐ D Stiff Soil ☐ E Soft Soil ☐ F Poor Soil

Falling Hazards

☑ Unreinforced Chimneys ☐ Parapets ☐ Cladding ☐ Other

Form PGA: 0.1 Site PGA: 0.1 High form PGA: 0.2

BASIC SCORE, MODIFIERS, AND FINAL SCORE, S

BUILDING TYPE	W1 (<5000 SF)	W2 (> 5000 SF)	S1 (MRF)	S2 (BR)	S3 (LM)	S4 (RC SW)	S5 (URM INF)	C1 (MRF)	C2 (SW)	C3 (URM INF)	PC1 (TU)	PC2	RM1 (FD)	RM2 (RD)	URM
Basic Score	+5.2	+4.8	+3.6	+3.6	+3.8	+3.6	+3.6	+3.0	+3.6	+3.2	+3.2	+3.2	+3.6	+3.4	+3.4
Mid Rise (4 to 7 stories)			+0.4	+0.4		+0.4	+0.4	+0.2	+0.4	+0.4		+0.6		+0.6	
High Rise (> 7 stories)			+1.4	+1.4		+1.4	+0.8	+0.5	+0.8	+0.4		+0.6		+0.6	
Vertical Irregularity	-3.5	-3.0	-2.0	-2.0		-2.0	-2.0	-2.0	-2.0	-2.0		-1.5	-2.0	-1.5	-1.5
Plan Irregularity	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
No redundancy	-0.5	-0.6	-0.6	-0.6	-0.6	-0.6	-0.9	-0.6	-0.6	-1.0	-0.6	-0.7	-0.6	-0.6	-0.9
Mass irregularity	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.9	-0.6	-0.6	-1.0	-0.6	-0.7	-0.6	-0.6	-0.9
Short column	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-2.1	-1.9	-3.0	N/A	-1.7	N/A	N/A	N/A
Weak column concrete	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-2.1	-1.9	-3.0	N/A	-1.7	N/A	N/A	N/A
Wood deterioration	-0.5	-0.6	N/A	N/A	N/A	N/A	N/A	N/A	-0.4	N/A	N/A	N/A	-0.4	N/A	N/A
Poor wall anchorage	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-1.3	N/A	-1.2	N/A	-1.3	N/A	-0.9
Poor load path	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.9	-0.6	-0.6	-1.0	-0.6	-0.7	-0.6	-0.6	-0.9
No cripple wall bracing	-2.4	-1.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lacks sill anchors	-2.0	-1.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Unreinforced chimney	-0.6	-6.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pre-Code	N/A	-0.2	-0.4	-0.4	-0.4	-0.4	-0.2	-1.0	-0.4	-1.0	-0.2	-0.4	-0.4	-0.4	-0.4
Post-Benchmark	+1.6	+1.6	+1.4	+1.4		+1.2		+1.2	+1.6		+1.8		+2.0	+1.8	
Soil Type C	-0.2	-0.8	-0.6	-0.8	-0.6	-0.8	-0.8	-0.6	-0.8	-0.6	-0.6	-0.6	-0.8	-0.6	-0.4
Soil Type D	-0.6	-1.2	-1.0	-1.2	-1.0	-1.2	-1.2	-1.0	-1.2	-1.0	-1.0	-1.2	-1.2	-1.2	-0.8
Soil Type E	-1.2	-1.8	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6
Other	0	0	0	0	0	0	0	0	0	0	0	0	+0.5	0	0
Final Score, S	**+1.9**														

COMMENTS:

Design EQ Collapse Potential: 1%

Detailed Evaluation Recommended

☐ YES ☑ NO

Rapid Visual Screening of Newberry National Volcanic Monument Site
Data Collection Form **Moderate Hazard**

Address: 43.706,-121.26
Zip: 97739
Other Identifiers:
No. Stories: 2 Year Built: 1920
Screener: CBGoings Date: 6/9/2011
Total Floor Area (sq. ft.):
Building Name: Newberry Group Camp Ground - Cabin 1
Use: Housing

Occupancy

☐ Assembly ☐ Research ☐ Office
☐ Hospital ☐ Retail ☑ Residential
☐ Emer. Services ☐ Industrial ☐ Restaurant
☑ <10 ☐ 11 to 100 ☐ 101 to 500 ☐ >500

Soil type

☐ A	☑ B	☐ C	☐ D	☐ E	☐ F
Hard Rock	Avg Rock	Dense Soil	Stiff Soil	Soft Soil	Poor Soil

Falling Hazards

☑	☐	☐	☐
Unreinforced Chimneys	Parapets	Cladding	Other

Form PGA: 0.1 Site PGA: 0.1 High form PGA: 0.2

BASIC SCORE, MODIFIERS, AND FINAL SCORE, S

BUILDING TYPE	W1 (<5000 SF)	W2 (> 5000 SF)	S1 (MRF)	S2 (BR)	S3 (LM)	S4 (RC SW)	S5 (URM INF)	C1 (MRF)	C2 (SW)	C3 (URM INF)	PC1 (TU)	PC2	RM1 (FD)	RM2 (RD)	URM
Basic Score	+5.2	+4.8	+3.6	+3.6	+3.8	+3.6	+3.6	+3.0	+3.6	+3.2	+3.2	+3.2	+3.6	+3.4	+3.4
Mid Rise (4 to 7 stories)			+0.4	+0.4		+0.4	+0.4	+0.2	+0.4	+0.4		+0.6		+0.6	
High Rise (> 7 stories)			+1.4	+1.4		+1.4	+0.8	+0.5	+0.8	+0.4		+0.6		+0.6	
Vertical Irregularity	-3.5	-3.0	-2.0	-2.0		-2.0	-2.0	-2.0	-2.0	-2.0		-1.5	-2.0	-1.5	-1.5
Plan Irregularity	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
No redundancy	-0.5	-0.6	-0.6	-0.6	-0.6	-0.6	-0.9	-0.6	-0.6	-1.0	-0.6	-0.7	-0.6	-0.6	-0.9
Mass irregularity	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.9	-0.6	-0.6	-1.0	-0.6	-0.7	-0.6	-0.6	-0.9
Short column	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-2.1	-1.9	-3.0	N/A	-1.7	N/A	N/A	N/A
Weak column concrete	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-2.1	-1.9	-3.0	N/A	-1.7	N/A	N/A	N/A
Wood deterioration	-0.5	-0.6	N/A	N/A	N/A	N/A	N/A	N/A	-0.4	N/A	N/A	N/A	-0.4	N/A	N/A
Poor wall anchorage	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-1.3	N/A	-1.2	N/A	-1.3	N/A	-0.9
Poor load path	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.9	-0.6	-0.6	-1.0	-0.6	-0.7	-0.6	-0.6	-0.9
No cripple wall bracing	-2.4	-1.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lacks sill anchors	-2.0	-1.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Unreinforced chimney	-0.6	-6.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pre-Code	N/A	-0.2	-0.4	-0.4	-0.4	-0.4	-0.2	-1.0	-0.4	-1.0	-0.2	-0.4	-0.4	-0.4	-0.4
Post-Benchmark	+1.6	+1.6	+1.4	+1.4		+1.2		+1.2	+1.6		+1.8		+2.0	+1.8	
Soil Type C	-0.2	-0.8	-0.6	-0.8	-0.6	-0.8	-0.8	-0.6	-0.8	-0.6	-0.6	-0.6	-0.8	-0.6	-0.4
Soil Type D	-0.6	-1.2	-1.0	-1.2	-1.0	-1.2	-1.2	-1.0	-1.2	-1.0	-1.0	-1.2	-1.2	-1.2	-0.8
Soil Type E	-1.2	-1.8	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6
Other	0	0	0	0	0	0	0	0	0	0	0	0	+0.5	0	0
Final Score, S	**+1.9**														

COMMENTS: Chimney is in poor condition at top. Interior wood stove has brick chimney.

Design EQ Collapse Potential: 1%

Detailed Evaluation Recommended

☐ YES ☑ NO

Rapid Visual Screening of Newberry National Volcanic Monument Site
Data Collection Form **Moderate Hazard**

Address: 43.706,-121.26
Zip: 97739
Other Identifiers:
No. Stories: 2 Year Built: 1920
Screener: CBGoings Date: 6/9/2011
Total Floor Area (sq. ft.):
Building Name: Newberry Group Camp Ground - Cabin 2
Use: Housing

Occupancy

☐ Assembly ☐ Research ☐ Office
☐ Hospital ☐ Retail ☑ Residential
☐ Emer. Services ☐ Industrial ☐ Restaurant
☑ <10 ☐ 11 to 100 ☐ 101 to 500 ☐ >500

Soil type

☐ A Hard Rock ☑ B Avg Rock ☐ C Dense Soil ☐ D Stiff Soil ☐ E Soft Soil ☐ F Poor Soil

Falling Hazards

☑ Unreinforced Chimneys ☐ Parapets ☐ Cladding ☐ Other

Form PGA: 0.1 Site PGA: 0.1 High form PGA: 0.2

BASIC SCORE, MODIFIERS, AND FINAL SCORE, S

BUILDING TYPE	W1 (<5000 SF)	W2 (> 5000 SF)	S1 (MRF)	S2 (BR)	S3 (LM)	S4 (RC SW)	S5 (URM INF)	C1 (MRF)	C2 (SW)	C3 (URM INF)	PC1 (TU)	PC2	RM1 (FD)	RM2 (RD)	URM
Basic Score	+5.2	+4.8	+3.6	+3.6	+3.8	+3.6	+3.6	+3.0	+3.6	+3.2	+3.2	+3.2	+3.6	+3.4	+3.4
Mid Rise (4 to 7 stories)			+0.4	+0.4		+0.4	+0.4	+0.2	+0.4	+0.4		+0.6		+0.6	
High Rise (> 7 stories)			+1.4	+1.4		+1.4	+0.8	+0.5	+0.8	+0.4		+0.6		+0.6	
Vertical Irregularity	-3.5	-3.0	-2.0	-2.0		-2.0	-2.0	-2.0	-2.0	-2.0		-1.5	-2.0	-1.5	-1.5
Plan Irregularity	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
No redundancy	-0.5	-0.6	-0.6	-0.6	-0.6	-0.6	-0.9	-0.6	-0.6	-1.0	-0.6	-0.7	-0.6	-0.6	-0.9
Mass irregularity	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.9	-0.6	-0.6	-1.0	-0.6	-0.7	-0.6	-0.6	-0.9
Short column	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-2.1	-1.9	-3.0	N/A	-1.7	N/A	N/A	N/A
Weak column concrete	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-2.1	-1.9	-3.0	N/A	-1.7	N/A	N/A	N/A
Wood deterioration	-0.5	-0.6	N/A	N/A	N/A	N/A	N/A	N/A	-0.4	N/A	N/A	N/A	-0.4	N/A	N/A
Poor wall anchorage	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-1.3	N/A	-1.2	N/A	-1.3	N/A	-0.9
Poor load path	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.9	-0.6	-0.6	-1.0	-0.6	-0.7	-0.6	-0.6	-0.9
No cripple wall bracing	-2.4	-1.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lacks sill anchors	-2.0	-1.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Unreinforced chimney	-0.6	-6.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pre-Code	N/A	-0.2	-0.4	-0.4	-0.4	-0.4	-0.2	-1.0	-0.4	-1.0	-0.2	-0.4	-0.4	-0.4	-0.4
Post-Benchmark	+1.6	+1.6	+1.4	+1.4		+1.2		+1.2	+1.6		+1.8		+2.0	+1.8	
Soil Type C	-0.2	-0.8	-0.6	-0.8	-0.6	-0.8	-0.8	-0.6	-0.8	-0.6	-0.6	-0.6	-0.8	-0.6	-0.4
Soil Type D	-0.6	-1.2	-1.0	-1.2	-1.0	-1.2	-1.2	-1.0	-1.2	-1.0	-1.0	-1.2	-1.2	-1.2	-0.8
Soil Type E	-1.2	-1.8	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6
Other	0	0	0	0	0	0	0	0	0	0	0	0	+0.5	0	0
Final Score, S	**+1.9**														

COMMENTS: Interior wood stove has brick chimney.

Design EQ Collapse Potential: 1%

Detailed Evaluation Recommended

☐ YES ☑ NO

Rapid Visual Screening of Newberry National Volcanic Monument Site
Data Collection Form **Moderate Hazard**

Address: 43.723,-121.20
Zip: 97739
Other Identifiers:
No. Stories: 1 Year Built: Unknown
Screener: CBGoings Date: 6/9/2011
Total Floor Area (sq. ft.):
Building Name: East Lake Resort - Store Café
Use: Retail store

Occupancy

☐ Assembly ☐ Research ☐ Office
☐ Hospital ☑ Retail ☐ Residential
☐ Emer. Services ☐ Industrial ☐ Restaurant
☑ <10 ☐ 11 to 100 ☐ 101 to 500 ☐ >500

Soil type

☐ A Hard Rock ☑ B Avg Rock ☐ C Dense Soil ☐ D Stiff Soil ☐ E Soft Soil ☐ F Poor Soil

Falling Hazards

☐ Unreinforced Chimneys ☐ Parapets ☐ Cladding ☐ Other

Form PGA: 0.1 Site PGA: 0.1 High form PGA: 0.2

BASIC SCORE, MODIFIERS, AND FINAL SCORE, S

BUILDING TYPE	W1 (<5000 SF)	W2 (> 5000 SF)	S1 (MRF)	S2 (BR)	S3 (LM)	S4 (RC SW)	S5 (URM INF)	C1 (MRF)	C2 (SW)	C3 (URM INF)	PC1 (TU)	PC2	RM1 (FD)	RM2 (RD)	URM
Basic Score	+5.2	+4.8	+3.6	+3.6	+3.8	+3.6	+3.6	+3.0	+3.6	+3.2	+3.2	+3.2	+3.6	+3.4	+3.4
Mid Rise (4 to 7 stories)			+0.4	+0.4		+0.4	+0.4	+0.2	+0.4	+0.4		+0.6		+0.6	
High Rise (> 7 stories)			+1.4	+1.4		+1.4	+0.8	+0.5	+0.8	+0.4		+0.6		+0.6	
Vertical Irregularity	-3.5	-3.0	-2.0	-2.0		-2.0	-2.0	-2.0	-2.0	-2.0		-1.5	-2.0	-1.5	-1.5
Plan Irregularity	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
No redundancy	-0.5	-0.6	-0.6	-0.6	-0.6	-0.6	-0.9	-0.6	-0.6	-1.0	-0.6	-0.7	-0.6	-0.6	-0.9
Mass irregularity	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.9	-0.6	-0.6	-1.0	-0.6	-0.7	-0.6	-0.6	-0.9
Short column	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-2.1	-1.9	-3.0	N/A	-1.7	N/A	N/A	N/A
Weak column concrete	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-2.1	-1.9	-3.0	N/A	-1.7	N/A	N/A	N/A
Wood deterioration	-0.5	-0.6	N/A	N/A	N/A	N/A	N/A	N/A	-0.4	N/A	N/A	N/A	-0.4	N/A	N/A
Poor wall anchorage	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-1.3	N/A	-1.2	N/A	-1.3	N/A	-0.9
Poor load path	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.9	-0.6	-0.6	-1.0	-0.6	-0.7	-0.6	-0.6	-0.9
No cripple wall bracing	-2.4	-1.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lacks sill anchors	-2.0	-1.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Unreinforced chimney	-0.6	-6.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pre-Code	N/A	-0.2	-0.4	-0.4	-0.4	-0.4	-0.2	-1.0	-0.4	-1.0	-0.2	-0.4	-0.4	-0.4	-0.4
Post-Benchmark	+1.6	+1.6	+1.4	+1.4		+1.2		+1.2	+1.6		+1.8		+2.0	+1.8	
Soil Type C	-0.2	-0.8	-0.6	-0.8	-0.6	-0.8	-0.8	-0.6	-0.8	-0.6	-0.6	-0.6	-0.8	-0.6	-0.4
Soil Type D	-0.6	-1.2	-1.0	-1.2	-1.0	-1.2	-1.2	-1.0	-1.2	-1.0	-1.0	-1.2	-1.2	-1.2	-0.8
Soil Type E	-1.2	-1.8	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6
Other	0	0	0	0	0	0	0	0	0	0	0	0	+0.5	0	0
Final Score, S	**+3.0**														

COMMENTS:

Design EQ Collapse Potential: <1%

Detailed Evaluation Recommended

☐ YES ☑ NO

Rapid Visual Screening of Newberry National Volcanic Monument Site
Data Collection Form **Moderate Hazard**

Address: 43.723,-121.20
Zip: 97739
Other Identifiers:
No. Stories: 1 Year Built: Unknown
Screener: CBGoings Date: 6/9/2011
Total Floor Area (sq. ft.):
Building Name: East Lake Resort - Wood Duck Cabin
Use: Housing

Occupancy

☐ Assembly ☐ Research ☐ Office
☐ Hospital ☐ Retail ☑ Residential
☐ Emer. Services ☐ Industrial ☐ Restaurant
☑ <10 ☐ 11 to 100 ☐ 101 to 500 ☐ >500

Soil type

☐ A Hard Rock ☑ B Avg Rock ☐ C Dense Soil ☐ D Stiff Soil ☐ E Soft Soil ☐ F Poor Soil

Falling Hazards

☐ Unreinforced Chimneys ☐ Parapets ☐ Cladding ☐ Other

Form PGA: 0.1 Site PGA: 0.1 High form PGA: 0.2

BASIC SCORE, MODIFIERS, AND FINAL SCORE, S

BUILDING TYPE	W1 (<5000 SF)	W2 (> 5000 SF)	S1 (MRF)	S2 (BR)	S3 (LM)	S4 (RC SW)	S5 (URM INF)	C1 (MRF)	C2 (SW)	C3 (URM INF)	PC1 (TU)	PC2	RM1 (FD)	RM2 (RD)	URM
Basic Score	+5.2	+4.8	+3.6	+3.6	+3.8	+3.6	+3.6	+3.0	+3.6	+3.2	+3.2	+3.2	+3.6	+3.4	+3.4
Mid Rise (4 to 7 stories)			+0.4	+0.4		+0.4	+0.4	+0.2	+0.4	+0.4		+0.6		+0.6	
High Rise (> 7 stories)			+1.4	+1.4		+1.4	+0.8	+0.5	+0.8	+0.4		+0.6		+0.6	
Vertical Irregularity	-3.5	-3.0	-2.0	-2.0		-2.0	-2.0	-2.0	-2.0	-2.0		-1.5	-2.0	-1.5	-1.5
Plan Irregularity	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
No redundancy	-0.5	-0.6	-0.6	-0.6	-0.6	-0.6	-0.9	-0.6	-0.6	-1.0	-0.6	-0.7	-0.6	-0.6	-0.9
Mass irregularity	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.9	-0.6	-0.6	-1.0	-0.6	-0.7	-0.6	-0.6	-0.9
Short column	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-2.1	-1.9	-3.0	N/A	-1.7	N/A	N/A	N/A
Weak column concrete	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-2.1	-1.9	-3.0	N/A	-1.7	N/A	N/A	N/A
Wood deterioration	-0.5	-0.6	N/A	N/A	N/A	N/A	N/A	N/A	-0.4	N/A	N/A	N/A	-0.4	N/A	N/A
Poor wall anchorage	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-1.3	N/A	-1.2	N/A	-1.3	N/A	-0.9
Poor load path	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.9	-0.6	-0.6	-1.0	-0.6	-0.7	-0.6	-0.6	-0.9
No cripple wall bracing	-2.4	-1.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lacks sill anchors	-2.0	-1.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Unreinforced chimney	-0.6	-6.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pre-Code	N/A	-0.2	-0.4	-0.4	-0.4	-0.4	-0.2	-1.0	-0.4	-1.0	-0.2	-0.4	-0.4	-0.4	-0.4
Post-Benchmark	+1.6	+1.6	+1.4	+1.4		+1.2		+1.2	+1.6		+1.8		+2.0	+1.8	
Soil Type C	-0.2	-0.8	-0.6	-0.8	-0.6	-0.8	-0.8	-0.6	-0.8	-0.6	-0.6	-0.6	-0.8	-0.6	-0.4
Soil Type D	-0.6	-1.2	-1.0	-1.2	-1.0	-1.2	-1.2	-1.0	-1.2	-1.0	-1.0	-1.2	-1.2	-1.2	-0.8
Soil Type E	-1.2	-1.8	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6
Other	0	0	0	0	0	0	0	0	0	0	0	0	+0.5	0	0
Final Score, S	**+3.0**														

COMMENTS: The foundation is concrete and looks to be deteriorated.

Design EQ Collapse Potential: <1%

Detailed Evaluation Recommended

☐ YES ☑ NO

Rapid Visual Screening of Newberry National Volcanic Monument Site
Data Collection Form **Moderate Hazard**

Address: 43.723,-121.20
Zip: 97739
Other Identifiers:
No. Stories: 1 Year Built: Unknown
Screener: CBGoings Date: 6/9/2011
Total Floor Area (sq. ft.):
Building Name: East Lake Resort - Wood Duck Cabin
Use: Housing

Occupancy

☐ Assembly ☐ Research ☐ Office
☐ Hospital ☐ Retail ☑ Residential
☐ Emer. Services ☐ Industrial ☐ Restaurant
☑ <10 ☐ 11 to 100 ☐ 101 to 500 ☐ >500

Soil type

☐ A	☑ B	☐ C	☐ D	☐ E	☐ F
Hard Rock	Avg Rock	Dense Soil	Stiff Soil	Soft Soil	Poor Soil

Falling Hazards

☐ Unreinforced Chimneys ☐ Parapets ☐ Cladding ☐ Other

Form PGA: 0.1 Site PGA: 0.1 High form PGA: 0.2

BASIC SCORE, MODIFIERS, AND FINAL SCORE, S

BUILDING TYPE	W1 (<5000 SF)	W2 (> 5000 SF)	S1 (MRF)	S2 (BR)	S3 (LM)	S4 (RC SW)	S5 (URM INF)	C1 (MRF)	C2 (SW)	C3 (URM INF)	PC1 (TU)	PC2	RM1 (FD)	RM2 (RD)	URM
Basic Score	+5.2	+4.8	+3.6	+3.6	+3.8	+3.6	+3.6	+3.0	+3.6	+3.2	+3.2	+3.2	+3.6	+3.4	+3.4
Mid Rise (4 to 7 stories)			+0.4	+0.4		+0.4	+0.4	+0.2	+0.4	+0.4		+0.6		+0.6	
High Rise (> 7 stories)			+1.4	+1.4		+1.4	+0.8	+0.5	+0.8	+0.4		+0.6		+0.6	
Vertical Irregularity	-3.5	-3.0	-2.0	-2.0		-2.0	-2.0	-2.0	-2.0	-2.0		-1.5	-2.0	-1.5	-1.5
Plan Irregularity	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
No redundancy	-0.5	-0.6	-0.6	-0.6	-0.6	-0.6	-0.9	-0.6	-0.6	-1.0	-0.6	-0.7	-0.6	-0.6	-0.9
Mass irregularity	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.9	-0.6	-0.6	-1.0	-0.6	-0.7	-0.6	-0.6	-0.9
Short column	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-2.1	-1.9	-3.0	N/A	-1.7	N/A	N/A	N/A
Weak column concrete	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-2.1	-1.9	-3.0	N/A	-1.7	N/A	N/A	N/A
Wood deterioration	-0.5	-0.6	N/A	N/A	N/A	N/A	N/A	N/A	-0.4	N/A	N/A	N/A	-0.4	N/A	N/A
Poor wall anchorage	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-1.3	N/A	-1.2	N/A	-1.3	N/A	-0.9
Poor load path	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.9	-0.6	-0.6	-1.0	-0.6	-0.7	-0.6	-0.6	-0.9
No cripple wall bracing	-2.4	-1.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lacks sill anchors	-2.0	-1.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Unreinforced chimney	-0.6	-6.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pre-Code	N/A	-0.2	-0.4	-0.4	-0.4	-0.4	-0.2	-1.0	-0.4	-1.0	-0.2	-0.4	-0.4	-0.4	-0.4
Post-Benchmark	+1.6	+1.6	+1.4	+1.4		+1.2		+1.2	+1.6		+1.8		+2.0	+1.8	
Soil Type C	-0.2	-0.8	-0.6	-0.8	-0.6	-0.8	-0.8	-0.6	-0.8	-0.6	-0.6	-0.6	-0.8	-0.6	-0.4
Soil Type D	-0.6	-1.2	-1.0	-1.2	-1.0	-1.2	-1.2	-1.0	-1.2	-1.0	-1.0	-1.2	-1.2	-1.2	-0.8
Soil Type E	-1.2	-1.8	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6
Other	0	0	0	0	0	0	0	0	0	0	0	0	+0.5	0	0
Final Score, S	**+3.0**														

COMMENTS:

Design EQ Collapse Potential: <1%

Detailed Evaluation Recommended

☐ YES ☑ NO

Rapid Visual Screening of Newberry National Volcanic Monument Site
Data Collection Form **Moderate Hazard**

Address: 43.711,-121.28
Zip: 97739
Other Identifiers:
No. Stories: 2 Year Built: 1937
Screener: CBGoings Date: 6/9/2011
Total Floor Area (sq. ft.):
Building Name: Paulina Lake Guard Station - Crew House
Use: Housing

Occupancy

☐ Assembly ☐ Research ☐ Office
☐ Hospital ☐ Retail ☑ Residential
☐ Emer. Services ☐ Industrial ☐ Restaurant
☑ <10 ☐ 11 to 100 ☐ 101 to 500 ☐ >500

Soil type

☐ A Hard Rock ☑ B Avg Rock ☐ C Dense Soil ☐ D Stiff Soil ☐ E Soft Soil ☐ F Poor Soil

Falling Hazards

☐ Unreinforced Chimneys ☐ Parapets ☐ Cladding ☐ Other

Form PGA: 0.1 Site PGA: 0.1 High form PGA: 0.2

BASIC SCORE, MODIFIERS, AND FINAL SCORE, S

BUILDING TYPE	W1 (<5000 SF)	W2 (> 5000 SF)	S1 (MRF)	S2 (BR)	S3 (LM)	S4 (RC SW)	S5 (URM INF)	C1 (MRF)	C2 (SW)	C3 (URM INF)	PC1 (TU)	PC2	RM1 (FD)	RM2 (RD)	URM
Basic Score	+5.2	+4.8	+3.6	+3.6	+3.8	+3.6	+3.6	+3.0	+3.6	+3.2	+3.2	+3.2	+3.6	+3.4	+3.4
Mid Rise (4 to 7 stories)			+0.4	+0.4		+0.4	+0.4	+0.2	+0.4	+0.4		+0.6		+0.6	
High Rise (> 7 stories)			+1.4	+1.4		+1.4	+0.8	+0.5	+0.8	+0.4		+0.6		+0.6	
Vertical Irregularity	-3.5	-3.0	-2.0	-2.0		-2.0	-2.0	-2.0	-2.0	-2.0		-1.5	-2.0	-1.5	-1.5
Plan Irregularity	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
No redundancy	-0.5	-0.6	-0.6	-0.6	-0.6	-0.6	-0.9	-0.6	-0.6	-1.0	-0.6	-0.7	-0.6	-0.6	-0.9
Mass irregularity	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.9	-0.6	-0.6	-1.0	-0.6	-0.7	-0.6	-0.6	-0.9
Short column	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-2.1	-1.9	-3.0	N/A	-1.7	N/A	N/A	N/A
Weak column concrete	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-2.1	-1.9	-3.0	N/A	-1.7	N/A	N/A	N/A
Wood deterioration	-0.5	-0.6	N/A	N/A	N/A	N/A	N/A	N/A	-0.4	N/A	N/A	N/A	-0.4	N/A	N/A
Poor wall anchorage	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-1.3	N/A	-1.2	N/A	-1.3	N/A	-0.9
Poor load path	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.9	-0.6	-0.6	-1.0	-0.6	-0.7	-0.6	-0.6	-0.9
No cripple wall bracing	-2.4	-1.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lacks sill anchors	-2.0	-1.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Unreinforced chimney	-0.6	-6.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pre-Code	N/A	-0.2	-0.4	-0.4	-0.4	-0.4	-0.2	-1.0	-0.4	-1.0	-0.2	-0.4	-0.4	-0.4	-0.4
Post-Benchmark	+1.6	+1.6	+1.4	+1.4		+1.2		+1.2	+1.6		+1.8		+2.0	+1.8	
Soil Type C	-0.2	-0.8	-0.6	-0.8	-0.6	-0.8	-0.8	-0.6	-0.8	-0.6	-0.6	-0.6	-0.8	-0.6	-0.4
Soil Type D	-0.6	-1.2	-1.0	-1.2	-1.0	-1.2	-1.2	-1.0	-1.2	-1.0	-1.0	-1.2	-1.2	-1.2	-0.8
Soil Type E	-1.2	-1.8	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6
Other	0	0	0	0	0	0	0	0	0	0	0	0	+0.5	0	0
Final Score, S	**+3.0**														

COMMENTS:

Design EQ Collapse Potential: <1%

Detailed Evaluation Recommended

☐ YES ☑ NO

Rapid Visual Screening of Newberry National Volcanic Monument Site
Data Collection Form **Moderate Hazard**

Address: 43.711,-121.28
Zip: 97739
Other Identifiers:
No. Stories: 1 Year Built: 1934
Screener: CBGoings Date: 6/9/2011
Total Floor Area (sq. ft.):
Building Name: Paulina Lake Guard Station - Wash House
Use: Laundry

Occupancy

☐ Assembly ☐ Research ☐ Office
☐ Hospital ☐ Retail ☐ Residential
☐ Emer. Services ☑ Industrial ☐ Restaurant
☑ <10 ☐ 11 to 100 ☐ 101 to 500 ☐ >500

Soil type

☐ A Hard Rock ☑ B Avg Rock ☐ C Dense Soil ☐ D Stiff Soil ☐ E Soft Soil ☐ F Poor Soil

Falling Hazards

☐ Unreinforced Chimneys ☐ Parapets ☐ Cladding ☐ Other

Form PGA: 0.1 Site PGA: 0.1 High form PGA: 0.2

BASIC SCORE, MODIFIERS, AND FINAL SCORE, S

BUILDING TYPE	W1 (<5000 SF)	W2 (> 5000 SF)	S1 (MRF)	S2 (BR)	S3 (LM)	S4 (RC SW)	S5 (URM INF)	C1 (MRF)	C2 (SW)	C3 (URM INF)	PC1 (TU)	PC2	RM1 (FD)	RM2 (RD)	URM
Basic Score	+5.2	+4.8	+3.6	+3.6	+3.8	+3.6	+3.6	+3.0	+3.6	+3.2	+3.2	+3.2	+3.6	+3.4	+3.4
Mid Rise (4 to 7 stories)			+0.4	+0.4		+0.4	+0.4	+0.2	+0.4	+0.4		+0.6		+0.6	
High Rise (> 7 stories)			+1.4	+1.4		+1.4	+0.8	+0.5	+0.8	+0.4		+0.6		+0.6	
Vertical Irregularity	-3.5	-3.0	-2.0	-2.0		-2.0	-2.0	-2.0	-2.0	-2.0		-1.5	-2.0	-1.5	-1.5
Plan Irregularity	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
No redundancy	-0.5	-0.6	-0.6	-0.6	-0.6	-0.6	-0.9	-0.6	-0.6	-1.0	-0.6	-0.7	-0.6	-0.6	-0.9
Mass irregularity	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.9	-0.6	-0.6	-1.0	-0.6	-0.7	-0.6	-0.6	-0.9
Short column	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-2.1	-1.9	-3.0	N/A	-1.7	N/A	N/A	N/A
Weak column concrete	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-2.1	-1.9	-3.0	N/A	-1.7	N/A	N/A	N/A
Wood deterioration	-0.5	-0.6	N/A	N/A	N/A	N/A	N/A	N/A	-0.4	N/A	N/A	N/A	-0.4	N/A	N/A
Poor wall anchorage	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-1.3	N/A	-1.2	N/A	-1.3	N/A	-0.9
Poor load path	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.9	-0.6	-0.6	-1.0	-0.6	-0.7	-0.6	-0.6	-0.9
No cripple wall bracing	-2.4	-1.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lacks sill anchors	-2.0	-1.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Unreinforced chimney	-0.6	-6.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pre-Code	N/A	-0.2	-0.4	-0.4	-0.4	-0.4	-0.2	-1.0	-0.4	-1.0	-0.2	-0.4	-0.4	-0.4	-0.4
Post-Benchmark	+1.6	+1.6	+1.4	+1.4		+1.2		+1.2	+1.6		+1.8		+2.0	+1.8	
Soil Type C	-0.2	-0.8	-0.6	-0.8	-0.6	-0.8	-0.8	-0.6	-0.8	-0.6	-0.6	-0.6	-0.8	-0.6	-0.4
Soil Type D	-0.6	-1.2	-1.0	-1.2	-1.0	-1.2	-1.2	-1.0	-1.2	-1.0	-1.0	-1.2	-1.2	-1.2	-0.8
Soil Type E	-1.2	-1.8	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6
Other	0	0	0	0	0	0	0	0	0	0	0	0	+0.5	0	0
Final Score, S	**+3.0**														

COMMENTS:

Design EQ Collapse Potential: <1%

Detailed Evaluation Recommended

☐ YES ☑ NO

Rapid Visual Screening of Newberry National Volcanic Monument Site
Data Collection Form **Moderate Hazard**

Address: 43.712,-121.28
Zip: 97739
Other Identifiers:
No. Stories: 1 Year Built: Unknown
Screener: CBGoings Date: 6/9/2011
Total Floor Area (sq. ft.):
Building Name: Paulina Lake Guard Station - Visitors Center
Use: Visitor center and guard station

Occupancy

- ☐ Assembly
- ☐ Research
- ☑ Office
- ☐ Hospital
- ☐ Retail
- ☐ Residential
- ☐ Emer. Services
- ☐ Industrial
- ☐ Restaurant
- ☑ <10 ☐ 11 to 100 ☐ 101 to 500 ☐ >500

Soil type

- ☐ A Hard Rock
- ☑ B Avg Rock
- ☐ C Dense Soil
- ☐ D Stiff Soil
- ☐ E Soft Soil
- ☐ F Poor Soil

Falling Hazards

- ☑ Unreinforced Chimneys
- ☐ Parapets
- ☐ Cladding
- ☐ Other

Form PGA: 0.1 Site PGA: 0.1 High form PGA: 0.2

BASIC SCORE, MODIFIERS, AND FINAL SCORE, S

BUILDING TYPE	W1 (<5000 SF)	W2 (> 5000 SF)	S1 (MRF)	S2 (BR)	S3 (LM)	S4 (RC SW)	S5 (URM INF)	C1 (MRF)	C2 (SW)	C3 (URM INF)	PC1 (TU)	PC2	RM1 (FD)	RM2 (RD)	URM
Basic Score	+5.2	+4.8	+3.6	+3.6	+3.8	+3.6	+3.6	+3.0	+3.6	+3.2	+3.2	+3.2	+3.6	+3.4	+3.4
Mid Rise (4 to 7 stories)			+0.4	+0.4		+0.4	+0.4	+0.2	+0.4	+0.4		+0.6		+0.6	
High Rise (> 7 stories)			+1.4	+1.4		+1.4	+0.8	+0.5	+0.8	+0.4		+0.6		+0.6	
Vertical Irregularity	-3.5	-3.0	-2.0	-2.0		-2.0	-2.0	-2.0	-2.0	-2.0		-1.5	-2.0	-1.5	-1.5
Plan Irregularity	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
No redundancy	-0.5	-0.6	-0.6	-0.6	-0.6	-0.6	-0.9	-0.6	-0.6	-1.0	-0.6	-0.7	-0.6	-0.6	-0.9
Mass irregularity	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.9	-0.6	-0.6	-1.0	-0.6	-0.7	-0.6	-0.6	-0.9
Short column	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-2.1	-1.9	-3.0	N/A	-1.7	N/A	N/A	N/A
Weak column concrete	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-2.1	-1.9	-3.0	N/A	-1.7	N/A	N/A	N/A
Wood deterioration	-0.5	-0.6	N/A	N/A	N/A	N/A	N/A	N/A	-0.4	N/A	N/A	N/A	-0.4	N/A	N/A
Poor wall anchorage	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-1.3	N/A	-1.2	N/A	-1.3	N/A	-0.9
Poor load path	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.9	-0.6	-0.6	-1.0	-0.6	-0.7	-0.6	-0.6	-0.9
No cripple wall bracing	-2.4	-1.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lacks sill anchors	-2.0	-1.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Unreinforced chimney	-0.6	-6.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pre-Code	N/A	-0.2	-0.4	-0.4	-0.4	-0.4	-0.2	-1.0	-0.4	-1.0	-0.2	-0.4	-0.4	-0.4	-0.4
Post-Benchmark	+1.6	+1.6	+1.4	+1.4		+1.2		+1.2	+1.6		+1.8		+2.0	+1.8	
Soil Type C	-0.2	-0.8	-0.6	-0.8	-0.6	-0.8	-0.8	-0.6	-0.8	-0.6	-0.6	-0.6	-0.8	-0.6	-0.4
Soil Type D	-0.6	-1.2	-1.0	-1.2	-1.0	-1.2	-1.2	-1.0	-1.2	-1.0	-1.0	-1.2	-1.2	-1.2	-0.8
Soil Type E	-1.2	-1.8	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6
Other	0	0	0	0	0	0	0	0	0	0	0	0	+0.5	0	0

Final Score, S **+2.4**

COMMENTS:

Design EQ Collapse Potential: <1%

Detailed Evaluation Recommended

☐ YES ☑ NO

Rapid Visual Screening of Newberry National Volcanic Monument Site
Data Collection Form **Moderate Hazard**

Address: 43.705,-121.31
Zip: 97739
Other Identifiers:
No. Stories: 1 Year Built: 2002
Screener: CBGoings Date: 6/9/2011
Total Floor Area (sq. ft.):
Building Name: Entrance Station
Use: National park entrance kiosk.

Occupancy

☐ Assembly ☐ Research ☑ Office
☐ Hospital ☐ Retail ☐ Residential
☐ Emer. Services ☐ Industrial ☐ Restaurant
☑ <10 ☐ 11 to 100 ☐ 101 to 500 ☐ >500

Soil type

☐ A Hard Rock ☑ B Avg Rock ☐ C Dense Soil ☐ D Stiff Soil ☐ E Soft Soil ☐ F Poor Soil

Falling Hazards

☐ Unreinforced Chimneys ☐ Parapets ☐ Cladding ☐ Other

Form PGA: 0.1 Site PGA: 0.1 High form PGA: 0.2

BASIC SCORE, MODIFIERS, AND FINAL SCORE, S

BUILDING TYPE	W1 (<5000 SF)	W2 (> 5000 SF)	S1 (MRF)	S2 (BR)	S3 (LM)	S4 (RC SW)	S5 (URM INF)	C1 (MRF)	C2 (SW)	C3 (URM INF)	PC1 (TU)	PC2	RM1 (FD)	RM2 (RD)	URM
Basic Score	+5.2	+4.8	+3.6	+3.6	+3.8	+3.6	+3.6	+3.0	+3.6	+3.2	+3.2	+3.2	+3.6	+3.4	+3.4
Mid Rise (4 to 7 stories)			+0.4	+0.4		+0.4	+0.4	+0.2	+0.4	+0.4		+0.6		+0.6	
High Rise (> 7 stories)			+1.4	+1.4		+1.4	+0.8	+0.5	+0.8	+0.4		+0.6		+0.6	
Vertical Irregularity	-3.5	-3.0	-2.0	-2.0		-2.0	-2.0	-2.0	-2.0	-2.0		-1.5	-2.0	-1.5	-1.5
Plan Irregularity	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
No redundancy	-0.5	-0.6	-0.6	-0.6	-0.6	-0.6	-0.9	-0.6	-0.6	-1.0	-0.6	-0.7	-0.6	-0.6	-0.9
Mass irregularity	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.9	-0.6	-0.6	-1.0	-0.6	-0.7	-0.6	-0.6	-0.9
Short column	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-2.1	-1.9	-3.0	N/A	-1.7	N/A	N/A	N/A
Weak column concrete	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-2.1	-1.9	-3.0	N/A	-1.7	N/A	N/A	N/A
Wood deterioration	-0.5	-0.6	N/A	N/A	N/A	N/A	N/A	N/A	-0.4	N/A	N/A	N/A	-0.4	N/A	N/A
Poor wall anchorage	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-1.3	N/A	-1.2	N/A	-1.3	N/A	-0.9
Poor load path	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.9	-0.6	-0.6	-1.0	-0.6	-0.7	-0.6	-0.6	-0.9
No cripple wall bracing	-2.4	-1.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lacks sill anchors	-2.0	-1.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Unreinforced chimney	-0.6	-6.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pre-Code	N/A	-0.2	-0.4	-0.4	-0.4	-0.4	-0.2	-1.0	-0.4	-1.0	-0.2	-0.4	-0.4	-0.4	-0.4
Post-Benchmark	+1.6	+1.6	+1.4	+1.4		+1.2		+1.2	+1.6		+1.8		+2.0	+1.8	
Soil Type C	-0.2	-0.8	-0.6	-0.8	-0.6	-0.8	-0.8	-0.6	-0.8	-0.6	-0.6	-0.6	-0.8	-0.6	-0.4
Soil Type D	-0.6	-1.2	-1.0	-1.2	-1.0	-1.2	-1.2	-1.0	-1.2	-1.0	-1.0	-1.2	-1.2	-1.2	-0.8
Soil Type E	-1.2	-1.8	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6
Other	0	0	0	0	0	0	0	0	0	0	0	0	+0.5	0	0
Final Score, S	**+6.8**														

COMMENTS:

Design EQ Collapse Potential: <1%

Detailed Evaluation Recommended

☐ YES ☑ NO

Rapid Visual Screening of Newberry National Volcanic Monument Site
Data Collection Form **Moderate Hazard**

Address: 43.708,-121.33
Zip: 97739
Other Identifiers:
No. Stories: 1 Year Built: 1999
Screener: CBGoings Date: 6/9/2011
Total Floor Area (sq. ft.):
Building Name: 10 Mile Sno-Park - Snow Shelter
Use: National park entrance kiosk.

Occupancy

☐ Assembly ☐ Research ☑ Office
☐ Hospital ☐ Retail ☐ Residential
☐ Emer. Services ☐ Industrial ☐ Restaurant
☑ <10 ☐ 11 to 100 ☐ 101 to 500 ☐ >500

Soil type

☐ A Hard Rock ☑ B Avg Rock ☐ C Dense Soil ☐ D Stiff Soil ☐ E Soft Soil ☐ F Poor Soil

Falling Hazards

☐ Unreinforced Chimneys ☐ Parapets ☐ Cladding ☐ Other

Moderate Form PGA: 0.1 Site PGA: 0.1 High form PGA: 0.2

BASIC SCORE, MODIFIERS, AND FINAL SCORE, S

BUILDING TYPE	W1 (<5000 SF)	W2 (> 5000 SF)	S1 (MRF)	S2 (BR)	S3 (LM)	S4 (RC SW)	S5 (URM INF)	C1 (MRF)	C2 (SW)	C3 (URM INF)	PC1 (TU)	PC2	RM1 (FD)	RM2 (RD)	URM
Basic Score	+5.2	+4.8	+3.6	+3.6	+3.8	+3.6	+3.6	+3.0	+3.6	+3.2	+3.2	+3.2	+3.6	+3.4	+3.4
Mid Rise (4 to 7 stories)			+0.4	+0.4		+0.4	+0.4	+0.2	+0.4	+0.4		+0.6		+0.6	
High Rise (> 7 stories)			+1.4	+1.4		+1.4	+0.8	+0.5	+0.8	+0.4		+0.6		+0.6	
Vertical Irregularity	-3.5	-3.0	-2.0	-2.0		-2.0	-2.0	-2.0	-2.0	-2.0		-1.5	-2.0	-1.5	-1.5
Plan Irregularity	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
No redundancy	-0.5	-0.6	-0.6	-0.6	-0.6	-0.6	-0.9	-0.6	-0.6	-1.0	-0.6	-0.7	-0.6	-0.6	-0.9
Mass irregularity	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.9	-0.6	-0.6	-1.0	-0.6	-0.7	-0.6	-0.6	-0.9
Short column	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-2.1	-1.9	-3.0	N/A	-1.7	N/A	N/A	N/A
Weak column concrete	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-2.1	-1.9	-3.0	N/A	-1.7	N/A	N/A	N/A
Wood deterioration	-0.5	-0.6	N/A	N/A	N/A	N/A	N/A	N/A	-0.4	N/A	N/A	N/A	-0.4	N/A	N/A
Poor wall anchorage	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	-1.3	N/A	-1.2	N/A	-1.3	N/A	-0.9
Poor load path	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.9	-0.6	-0.6	-1.0	-0.6	-0.7	-0.6	-0.6	-0.9
No cripple wall bracing	-2.4	-1.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lacks sill anchors	-2.0	-1.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Unreinforced chimney	-0.6	-6.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pre-Code	N/A	-0.2	-0.4	-0.4	-0.4	-0.4	-0.2	-1.0	-0.4	-1.0	-0.2	-0.4	-0.4	-0.4	-0.4
Post-Benchmark	+1.6	+1.6	+1.4	+1.4		+1.2		+1.2	+1.6		+1.8		+2.0	+1.8	
Soil Type C	-0.2	-0.8	-0.6	-0.8	-0.6	-0.8	-0.8	-0.6	-0.8	-0.6	-0.6	-0.6	-0.8	-0.6	-0.4
Soil Type D	-0.6	-1.2	-1.0	-1.2	-1.0	-1.2	-1.2	-1.0	-1.2	-1.0	-1.0	-1.2	-1.2	-1.2	-0.8
Soil Type E	-1.2	-1.8	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6	-1.6
Other	N/A	0	0	0	0	0	0	0	0	0	0	0	+0.5	0	0
Final Score, S	**+3.2**														

COMMENTS: This is a relatively new building. However, it utilizes log cabin construction. The Other modifier accounts for the log cabin construction. The on-site construction photos show the logs being bolted together

Design EQ Collapse Potential: **<1%**

Detailed Evaluation Recommended

☐ YES ☑ NO