4.2 GEOLOGY AND SOILS

This section identifies the direct impacts related to geology and soils, including mineral resources, which could result from the development of each alternative described in **Section 2.0**. Impacts are measured against the environmental baseline presented in **Section 3.2**. Indirect and cumulative impacts are identified in **Section 4.14** and **Section 4.15**, respectively. Geology and soils mitigation measures are presented in **Section 5.2.1**.

SIGNIFICANCE CRITERIA

An impact of a project alternative related to geology and soils, including mineral resources, would be considered significant if it would:

- Cause or result in substantial soil erosion or loss of topsoil;
- Be located on a geological unit or soil that is unstable, or that could potentially become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse;
- Be located on expansive soil, as defined by the Uniform Building Code, creating substantial risk to life or property;
- Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving;
    - Rupture of a known earthquake fault as delineated on the most recent Alquist-Priolo Fault Zoning Map or based on other substantial evidence of a known fault;
    - Strong seismic ground shaking intensity;
    - Seismic-related ground failure, including liquefaction, as a result of strong seismic ground shaking; or
    - Landslides.
- Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state;
- Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan.

ANALYSIS METHODOLOGY

Impacts to and from geological resources were analyzed based on an examination of the project site, published information regarding geological hazards of the area, field studies, a site specific geotechnical investigation, and comparison of these factors to the significance criteria listed above.

4.2.1 ALTERNATIVE A – MIXED-USE TRIBAL DESTINATION RESORT AND CASINO

IMPACTS OF ALTERNATIVE A

Soils/Geology

4.2.1 Development of Alternative A has the potential to result in soil erosion and loss of topsoil on the project site. This is a potentially significant impact.

Significance After Mitigation

Implementation of **Mitigation Measures 1-1**, **1-2** and **2-2** would reduce potential impacts from soil erosion and loss of topsoil to *less-than-significant* levels.

Impact Discussion

As discussed in **Section 3.2**, the majority of the soils existing on the project site are not susceptible to significant sheet and rill erosion. However, construction activities such as grading and excavation of site soils increase the risk of erosion and loss of topsoil and would be a *potentially significant* impact. As part of Alternative A, large areas would be mass graded and excavated to accommodate project components. Soils excavated during construction would be stockpiled on-site and either be used for building pad development or transported off-site. While most of the affected areas have already been disturbed by previous development, potential impacts would occur if disturbed areas are not stabilized with temporary erosion control measures. Such impacts would be mitigated through the implementation of Best Management Practices (BMPs) for erosion control and a site specific Storm Water Pollution Prevention Plan (SWPPP) for temporary impacts during construction (**Mitigation Measure 2-1**). To mitigate long-term impacts, a conceptual grading and drainage plan, which includes erosion control measures, has been developed (**Appendix H**). Refer to **Section 4.3** for additional information regarding SWPPP implementation and avoidance of potential impacts from sediment-laden storm water being transported off-site.

While the impacts resulting from ground disturbing activities associated with Alternative A do not vary depending on ownership status, the permitting process for such activities varies somewhat between trust and fee lands, as discussed below.

Trust Lands

The Tribe would apply for coverage under the US Environmental Protection Agency's (USEPA) NPDES Construction General Permit on the land proposed for federal trust status. Prior to construction of Alternative A, erosion control measures would be employed in compliance with the National Pollution Distribution Elimination System (NPDES) General Permit (Construction General Permit) (**Mitigation Measure 1-1**). Provisions of the Construction General Permit

require a site-specific SWPPP to be developed prior to any ground disturbance at the project site. In addition, the Tribe would adopt a tribal grading ordinance similar to the City's grading ordinance (**Mitigation Measure 2-2**). Compliance with the NPDES Construction General Permit and the Tribe's grading ordinance would reduce potential impacts from soil erosion and loss of topsoil to *less-than-significant* levels.

Fee Lands

For portions of the project site that would remain in fee (Shoreline Park and Western Drive road improvements), coverage under California's NPDES Construction General Permit would be obtained. Additionally, development on fee lands would comply with the City of Richmond's (City's) Municipal Code, Chapter 12.44 Excavation, Grading and Earthwork Construction that requires a grading permit. A stipulation of the permit is the preparation of an Erosion and Sediment Control Plan (ESCP) by a registered civil engineer prior to development. The incorporation of BMPs applicable to Alternative A into the ESCP have been recommended as mitigation in **Section 5.2.1** (**Mitigation Measure 1-1**) to further reduce potential impacts of Alternative A. Through compliance with the NPDES Construction General Permit and the City's grading ordinance, potential impacts related to soil erosion and loss of topsoil would be *less-than-significant.*

4.2.2 Proposed components of Alternative A may be located on unstable soil that could result in on-site settlement of buildings or landslides. This is a potentially significant impact.

Significance After Mitigation

With implementation of **Mitigation Measure 1-2** presented in **Section 5.2.1**, a *less-than-significant* impact would occur.

Impact Discussion

As discussed in **Section 3.2**, fill materials are present along the low-lying western portions of the project site. Fill materials are located at depths ranging from approximately 3.5 to 9 feet below ground surface (bgs). Specifically, portions of the Point Hotel, retail components, park and other amenities associated with Alternative A are proposed for portions of the site known to contain fill material. The presence of deleterious fill materials could create unstable soil conditions and subsequently cause settlement of a building associated with Alternative A. This is a potentially significant impact. Mitigation is included in **Section 5.2.1** to reduce potential impacts to *less-than-significant* levels.

4.2.3 Proposed components of Alternative A may be located on soil that is considered expansive, as defined by the California Building Code (CBC), creating a substantial risk to life or property. This is a potentially significant impact.

Significance After Mitigation

With implementation of **Mitigation Measure 1-2** presented in **Section 5.2.1**, a *less-than-significant* impact would occur.

Impact Discussion

The 2006 geotechnical exploration (**Appendix I**) that focused on the southern residential area of the project site documented clayey surficial soils within that portion of the site slated for residential land uses. The clayey soils are considered moderately expansive, which can cause potential cracking of foundations, pavement, and potential damage to project-related site improvements. Using foundations designed to resist movements of expansive soils may reduce potential damage. Similar soils conditions may be found in areas not addressed in the 2006 geotechnical exploration. If similar expansive soils are present within the Alternative A development areas, and proper engineering protocols are not implemented such as foundations that are designed to resist movement of expansive soils, significant impacts could occur. Mitigation is included in **Section 5.2.1** to reduce potential impacts to *less-than-significant* levels.

Seismicity

4.2.4 Alternative A could expose people or structures to potential substantial adverse effects; including the risk of loss, injury, or death involving strong seismic activity and associated ground failure involving liquefaction or landslides/mudflows. This impact is potentially significant.

Significance After Mitigation

With implementation of **Mitigation Measure 1-2** and **1-3** presented in **Section 5.2.1**, potential impacts resulting from seismic activity would be reduced to *less-than-significant* levels.

Impact Discussion

A majority of the East Bay Area, including the project site, is located in an area classified as Seismic Zone 4, which indicates a geographic location with a high probability of significant seismic activity. An earthquake of moderate to high magnitude could cause considerable ground shaking at the project site. Without mitigation, strong seismic shaking in the project area could produce serious structural damage. The risk of loss, injury, or death involving strong seismic shaking activity can be mitigated to less-than-significant levels through conformance with the

CBC for seismic standards. Mitigation is included in **Section 5.2.1** that would reduce potential impacts from strong seismic activity to a *less-than-significant* level.

The current condition of several buildings located within the Winehaven Historic District present the risk of loss, injury, or death from collapse during strong seismic activity. In particular, historic buildings No.1, No.6, and No.13 present the greatest risk of structural failure due to their advanced state of disrepair. General recommendations for seismic retrofit and structural reinforcement are presented in a Historic Building Structural Assessment report (Lionakis Beaumont, 2008) (**Appendix E**). The recommendations include, but are not limited to, a seismic retrofit according to the CBC and Federal Emergency Management Agency (FEMA) National Earthquake Hazards Reduction Program (NEHRP) standards. Mitigation is included in **Section 5.2.1** that will reduce potential impacts from strong seismic activity to a *less-than-significant* level.

The site is not located within an Alquist-Priolo Special Study Zone and no faults cross the project site. The nearest active fault is the Northern Hayward Fault located approximately 4.4 miles east of the project site. Additionally, the soils potentially subject to liquefaction are localized and do not contain free faces or steep slopes (**Appendix I**). Generally speaking, the shoreline areas are susceptible to liquefaction and lateral spreading. A recent site specific geotechnical report, focused on the southern residential portion of the site, provides a number of recommendations for site preparation, designed to mitigate the potential impacts resulting from fault-related ground rupture, lateral spreading, liquefaction, and subsidence (Geocon, 2006) (**Appendix I**). Mitigation is included in **Section 5.2.1** that will reduce potential impacts related to ground rupture, lateral spreading, liquefaction, and subsidence to a *less-than-significant* level.

Mineral Resources

4.2.5 Development of Alternative A would not result in the loss of availability of a known mineral resource. No impact would occur.

The proposed grading and landform alteration associated with Alternative A would not adversely impact known or recorded mineral resources. As part of the proposed project, large quantities of rock would be generated from construction and grading activities. Mass grading could produce as much as 2.7 million cubic yards of net fill and aggregate. Excess aggregate generated from excavation activities associated with Alternative A would be transported off-site, primarily by barge, and used in regional construction projects as road base, stream stabilization material (rip rap), and for levee construction/reinforcement. Therefore, landform alterations and development associated with Alternative A would not result in a loss of economically viable aggregate or diminish the extraction of important ores or minerals. Additionally, there are no abandoned mines, shafts, or tailing that would affect development. As such, *no impact* would occur.

4.2.6 Development of Alternative A would not result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan. No impact would occur.

According to the City's General Plan (1994) there are no locally important mineral resource recovery sites delineated on the project site. Because there are no important mineral recovery sites within the project site, *no impacts* would occur as a result of Alternative A.

4.2.2 ALTERNATIVE B – MIXED-USE TRIBAL DESTINATION RESORT AND CASINO WITH RESIDENTIAL COMPONENT

IMPACTS OF ALTERNATIVE B

Soils/Geology

4.2.7 Development of Alternative B would result in increased potential for soil erosion on the project site. This is a potentially significant impact.

Significance After Mitigation

Implementation of **Mitigation Measures 1-1**, **1-2**, and **2-2** would reduce potential impacts from soil erosion and loss of topsoil to *less-than-significant* levels.

Impact Discussion

Erosion-related impacts during construction of Alternative B would be greater compared to Alternative A. In addition to the project components described **Section 2.0**, temporary construction activity such as mass grading and excavation will result in an additional 35 acres of land disturbance for the southern residential development area, when compared to Alternative A. Although much of the area to be graded has already been disturbed by previous construction activities, this increase in disturbed soils could result in potential impacts resulting from erosion. Under Alternative B, soils excavated during construction would be stockpiled on-site and either be used for building pad development or later transported off-site. As described in **Impact 4.2.1**, potential impacts would occur if disturbed areas are not stabilized with temporary erosion control BMPs during construction activities. As stated for Alternative A, such impacts would be mitigated through the implementation of BMPs for erosion control and a site specific SWPPP for temporary impacts during construction (**Mitigation Measure 2-1**). To mitigate long-term impacts, a conceptual grading and drainage plan, which includes erosion control measures, has been developed (**Appendix H**).

While the impacts resulting from ground disturbing activities associated with Alternative B do not vary depending on ownership status, the permitting process for such activities varies somewhat between trust and fee lands, as discussed below.

Trust Lands

Through adoption of a tribal grading ordinance (**Mitigation Measure 2-2**) similar measures would be required by the Tribe for grading on trust lands. Compliance with the NPDES Construction General Permit and the Tribe's grading ordinance, potential impacts related to soil erosion and loss of topsoil would be reduced to *less-than-significant* levels.

Fee Lands

As described in **Impact 4.2.1,** coverage under the NPDES Construction General Permit would require a site-specific SWPPP to be developed prior to any ground disturbance at the project site (**Mitigation Measure 2-1**). Erosion control measures would be employed in compliance with the NPDES Construction General Permit. For lands that would remain in fee status, compliance with California's NPDES Construction General Permit would be required. Additionally compliance with the City's Municipal Code, Chapter 12.44 Excavation, Grading and Earthwork Construction on fee lands would require a grading permit (**Mitigation Measure 2-2**). Prior to issuing a grading permit, an ESCP would be prepared by a registered civil engineer. The incorporation of BMPs applicable to Alternative B into the ESCP is recommended as mitigation in **Section 5.2.1** (**Mitigation Measure 1-1**). Through compliance with the NPDES Construction General Permit and the City's grading ordinance, potential impacts related to soil erosion and loss of topsoil would be reduced to *less-than-significant* levels.

4.2.8 Alternative B could potentially be located on unstable soil that could potentially result in settlement of buildings. This impact is potentially significant.

Significance After Mitigation

With implementation of **Mitigation Measure 1-2** presented in **Section 5.2.1**, a *less-than-significant* impact would occur.

Impact Discussion

As discussed in **Section 3.2,** fill materials are located within the southwesterly portion of the project site at depths ranging from approximately 3.5 to 9 feet bgs. The presence of fill materials could create unstable soils and subsequently cause settlement of a building associated with development of Alternative B. This is a potentially significant impact. Mitigation is included in **Section 5.2** to reduce potential impacts to *less-than-significant* levels.

4.2.9 Proposed components of Alternative B may be located on soil that is considered expansive, as defined by the California Building Code (CBC), creating a substantial risk to life or property. This is a potentially significant impact.

Significance After Mitigation

With implementation of **Mitigation Measure 1-2** presented in **Section 5.2.1**, a *less-than-significant* impact would occur.

Impact Discussion

The 2006 geotechnical exploration (Engeo, 2006) that focused on the southern residential area of the project site documents clayey surficial soils within that portion of the site slated for residential development. The clayey soils are considered moderately expansive, which can cause potential cracking of foundations, pavement, and potential damage to project related site improvements. Using foundations designed to resist movements of expansive soils may reduce potential damage. It should be assumed that similar soils conditions would be found in the areas that were not addressed in the 2006 geotechnical exploration. If similar expansive soils are present within the Alternative B development area, and proper engineering protocols are not implemented such as foundations that are designed to resist movement of expansive soils, significant impacts could occur.

Mitigation is included in **Section 5.2.1** to reduce potential impacts to *less-than-significant* levels.

Seismicity

4.2.10 Alternative B could expose people or structures to potential substantial adverse effects; including the risk of loss, injury, or death involving strong seismic activity and associated ground failure involving liquefaction or landslides/mudflows. This impact is potentially significant.

Significance After Mitigation

With implementation of **Mitigation Measure 1-2** and **1-3** presented in **Section 5.2.1**, a *less-than-significant* impact would occur.

Impact Discussion

The project site as well as most of the East Bay Area, is located in an area classified as Seismic Zone 4, which indicates a geographic location with a high probability of significant seismic activity. Alternative B would result in similar impacts resulting from strong seismic activity as

those discussed under Alternative A. Refer to **Impact 4.2.3** for a discussion of potential impacts. Mitigation included in **Section 5.2.1** will reduce potential impacts to a *less-than-significant* level.

Mineral Resources

4.2.11 Development on the project site would not result in the loss of availability of a known mineral resource. No impact would occur.

Alternative B would result in similar impacts as those described under Alternative A. Refer to **Impact 4.2.4** for a discussion of potential impacts.

4.2.12 Development of Alternative B would not result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan. No impact would occur.

Alternative B would result in similar impacts to a locally important mineral resource as those described under Alternative A. Refer to **Impact 4.2.5** for a discussion of potential impacts.

4.2.3 ALTERNATIVE C – REDUCED INTENSITY MIXED-USE TRIBAL DESTINATION RESORT AND CASINO

IMPACTS OF ALTERNATIVE C

Soils/Geology

4.2.13 Development of Alternative C would result in the increase in potential for soil erosion on the project site. This is a potentially significant impact.

Significance After Mitigation

Implementation of **Mitigation Measures 1-1**, **1-2**, and **2-2** would reduce potential impacts from soil erosion and loss of topsoil to *less-than-significant* levels.

Impact Discussion

The construction activities associated with Alternative C would have a reduced potential for impacts when compared to potential impacts that could result from Alternative A. While building sizes, cut and fill slopes, and areas to be graded would be less, impacts would remain *potentially significant*. Potential impacts are considered significant if disturbed areas are not stabilized with temporary erosion control measures.

Trust Lands

Through adoption of a tribal grading ordinance (**Mitigation Measure 2-2**) similar measures would be required by the Tribe for grading on trust lands. Compliance with the NPDES Construction General Permit and the Tribe's grading ordinance, potential impacts from Alternative C related to soil erosion and loss of topsoil would be reduced to *less-than-significant* levels.

Fee Lands

As stated above, such impacts would be mitigated through the implementation of Best Management Practices (BMPs) for erosion control, a site specific SWPPP for temporary impacts during construction, and an ECP as required by the City of Richmond for land that would remain in fee status. Through compliance with the NPDES Construction General Permit and the City's grading ordinance, potential impacts related to soil erosion and loss of topsoil would be reduced to *less-than-significant* levels.

4.2.14 Alternative C could be located on unstable soil that would potentially result in settlement of buildings. This is a potentially significant impact.

Significance After Mitigation

The implementation of **Mitigation Measure 1-2** presented in **Section 5.2.1** would reduce impacts to *less-than-significant* levels.

Impact Discussion

As discussed in **Section 3.2**, fill materials were encountered within the southwesterly portion of the project site at depths ranging from approximately 3.5 to 9 feet bgs. The presence of these fill materials could create unstable soils and subsequently cause settlement of a building associated with the project site. This is a potentially significant impact. Mitigation is included in **Section 5.2** to reduce potential impacts to *less-than-significant* levels.

4.2.15 Proposed components of Alternative C may be located on soil that is considered expansive, as defined by the California Building Code (CBC), creating a substantial risk to life or property. This is a potentially significant impact.

Significance After Mitigation

With implementation of **Mitigation Measure 1-2** presented in **Section 5.2.1**, a *less-than-significant* impact would occur.

Impact Discussion

As identified under Alternative B, the 2006 geotechnical exploration (Engeo, 2006) that focused on the southern residential area (for Alternatives B and D) of the project site documents clayey surficial soils within that portion of the site slated for residential development. The clayey soils are considered moderately expansive, which can cause potential cracking of foundations, pavement, and potential damage to project related site improvements. Using foundations designed to resist movements of expansive soils may reduce potential damage. It should be assumed that similar soils conditions would be found in the areas that were not addressed in the 2006 geotechnical exploration. If similar expansive soils are present within the Alternative C development area, and proper engineering protocols are not implemented such as foundations that are designed to resist movement of expansive soils, a *significant impact* could occur.

Mitigation is included in **Section 5.2.1** to reduce potential impacts to *less-than-significant* levels.

Seismicity

4.2.16 Alternative C could expose people or structures to potential substantial adverse effects; including the risk of loss, injury, or death involving strong seismic activity and associated ground failure involving liquefaction or landslides/mudflows. This impact is potentially significant.

Significance After Mitigation

With implementation of **Mitigation Measure 1-2** and **1-3** presented in **Section 5.2.1**, a *less-than-significant* impact would occur.

Impact Discussion

Alternative C would result in similar impacts resulting from strong seismic activity as those discussed under Alternative A. Refer to **Impact 4.2.3** for a discussion of potential impacts.

Mineral Resources

4.2.17 The proposed development under Alternative C would not result in the loss of availability of a known mineral resource. No impact would occur.

Alternative C would result in similar impacts as those described under Alternative A. Refer to **Impact 4.2.4** for a discussion of potential impacts.

4.2.18 Development of Alternative C would not result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan. No impact would occur.

Alternative C would result in similar impacts to mineral resources as those described under Alternative A. Refer to **Impact 4.2.5** for a discussion of potential impacts.

4.2.4 ALTERNATIVE D – NON-TRUST ACQUISITION WITH NON-GAMING MIXED-USE DEVELOPMENT

IMPACTS OF ALTERNATIVE D

Soils/Geology

4.2.19 Alternative D could result in the increase in potential for soil erosion on the project site. This is a potentially significant impact.

Significance After Mitigation

Implementation of **Mitigation Measures 1-1**, **1-2**, and **2-2** would reduce potential impacts from soil erosion and loss of topsoil to *less-than-significant* levels.

Impact Discussion

Construction of Alternative D would entail clearing and grading on mostly disturbed portions of the project area to accommodate the project components. The layout of the residential component for Alternative D requires approximately one million cubic yards of grading and excavation primarily along Western Drive. Due to the steep topography of the cut and fill slopes; the potential for erosion would be significant. Alternative D would have a *potentially significant* impact on topography. Therefore, mitigation is included in **Section 5.2.1** (**Mitigation Measure 1-1**) that would reduce potential impacts.

4.2.20 Alternative D may be located on unstable soil that could result in on-site or off-site landslides, or settlement of buildings. This is a potentially significant impact.

Significance After Mitigation

With implementation of **Mitigation Measure 1-2** presented in **Section 5.2.1**, a *less-than-significant* impact would occur.

Impact Discussion

As discussed in **Section 3.2**, fill materials were encountered within the southwesterly portion of the project site at depths ranging from approximately 3.5 to 9 feet bgs. The presence of these fill

materials could create unstable soils and subsequently cause settlement of buildings associated with development of Alternative D. This is a potentially significant impact. Mitigation is included in **Section 5.2** to reduce potential impacts to *less-than-significant* levels.

4.2.21 Proposed components of Alternative D may be located on soil that is considered expansive, as defined by the California Building Code (CBC), creating a substantial risk to life or property. This is a potentially significant impact.

Significance After Mitigation

With implementation of **Mitigation Measure 1-2** presented in **Section 5.2.1**, a *less-than-significant* impact would occur.

Impact Discussion

As identified under Alternative B, the 2006 geotechnical exploration (Engeo, 2006) that focused on the southern residential area (for Alternatives B and D) of the project site documents clayey surficial soils within that portion of the site slated for residential development. The clayey soils are considered moderately expansive, which can cause potential cracking of foundations, pavement, and potential damage to project related site improvements. Using foundations designed to resist movements of expansive soils may reduce potential damage. It should be assumed that similar soils conditions would be found in the areas that were not addressed in the 2006 geotechnical exploration. If similar expansive soils are present within the Alternative D development area, and proper engineering protocols are not implemented such as foundations that are designed to resist movement of expansive soils, a *significant impact* could occur.

Mitigation is included in **Section 5.2.1** to reduce potential impacts to *less-than-significant* levels.

Seismicity

4.2.22 Alternative D could expose people or structures to potential substantial adverse effects; including the risk of loss, injury, or death involving strong seismic activity and associated ground failure involving liquefaction or landslides/mudflows. This is a potentially significant impact.

Significance After Mitigation

With implementation of **Mitigation Measure 1-3** presented in **Section 5.2.1**, a *less-than-significant* impact would occur.

Impact Discussion

Alternative D would result in similar impacts resulting from strong seismic activity as those discussed under Alternative A. Refer to **Impact 4.2.3** for a discussion of potential impacts.

Mineral Resources

4.2.23 Alternative D would not result in the loss of availability of a known mineral resource. No impact would occur.

Alternative D would result in similar impacts as those described under Alternative A. Refer to **Impact 4.2.4** for a discussion of potential impacts.

4.2.24 Development of Alternative D would not result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan. No impact would occur.

Alternative D would result in similar impacts as those described under Alternative A. Refer to **Impact 4.2.5** for a discussion of potential impacts.

4.2.5 ALTERNATIVE E– TOTAL PARKLAND

IMPACTS OF ALTERNATIVE E

Soils/Geology

4.2.25 Alternative E would result in an increase in the potential for soil erosion on the project site. This is a potentially significant impact.

Significance After Mitigation

Implementation of **Mitigation Measures 1-1**, **1-2**, and **2-2** would reduce potential impacts from soil erosion and loss of topsoil to *less-than-significant* levels.

Impact Discussion

The construction activities associated with Alternative E would have a reduced potential for impacts when compared to Alternative A. The area planned for the construction of the Bay Trail segment would be the only location of grading activities under this alternative; such activities would still increase the risk of erosion and the loss of topsoil. As stated above, such impacts would be mitigated through the implementation of Best Management Practices (BMPs) for erosion control, a site specific SWPPP for temporary impacts during construction, and an ECP as required by the City of Richmond. Compliance with the NPDES Construction General Permit

and/or the City's grading ordinance and implementation of mitigation proposed in **Section 5.2.1**, impacts would be reduced to *less-than-significant* levels.

4.2.26 Alternative E would not be located on unstable soil that could result in on-site or off-site landslides, or settlement of buildings. No impact would occur.

Under the Alternative E there would be no significant landform alterations, and existing on-site buildings would remain unoccupied; therefore, *no impacts* to increased landslide potential or the settlement of buildings would occur.

4.2.27 Construction of the Bay Trail under Alternative E may be located on soil that is considered expansive, as defined by the California Building Code (CBC). No impact would occur.

Impact Discussion

Alternative E would include the construction of a segment of the Bay Trail, would construct minor park amenities (i.e. portable restrooms), and stabilize the buildings within the Winehaven Historic District. As such, the only new development that would occur outside of the existing development footprint under Alternative E would be the construction of the Bay Trail. This type of development would not be impacted by the presence of expansive soils and therefore, no impact would occur.

Seismicity

4.2.28 Alternative E could expose people or structures to potential substantial adverse effects; including the risk of loss, injury, or death involving strong seismic activity and associated ground failure involving liquefaction or landslides/mudslides. This is a potentially significant impact.

Significance After Mitigation

With implementation of **Mitigation Measure 1-3** presented in **Section 5.2.1**, a *less-than-significant* impact would occur.

Impact Discussion

Alternative E could result in similar types of impacts resulting from strong seismic activity as those discussed under Alternative A; however, those impacts would likely be reduced as fewer patrons would visit the site and visitors would remain outside of the existing buildings. Refer to **Impact 4.2.3** for a discussion of potential impacts.

Mineral Resources

4.2.29 Alternative E would not result in the loss of availability of a known mineral resource. No impact would occur.

Alternative E would result in similar impacts as those described under Alternative A. Refer to **Impact 4.2.4** for a discussion of potential impacts.

4.2.30 Development of Alternative E would not result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan. No impact would occur.

Alternative E would result in similar impacts as those described under Alternative A. Refer to **Impact 4.2.5** for a discussion of potential impacts.

4.2.6 ALTERNATIVE F – NO ACTION

IMPACTS OF ALTERNATIVE F

Soils/Geology

4.2.31 Alternative F would not result in the potential for soil erosion on the proposed project site. No impact would occur.

Under the No-Action Alternative, no development would occur on the project site. The topography and soils would therefore remain undisturbed and *no impact* would occur.

4.2.32 Alternative F would not be located on unstable soil that could result in on-site or off-site landslides, or settlement of buildings. No impact would occur.

Under the No-Action Alternative there would be no landform alterations, and existing on-site buildings would remain unoccupied; therefore, Alternative F would not result in on-site or off-site landslides, or settlement of buildings. And *no impact* would occur.

4.2.33 Alternative F would not be located on soil that is considered expansive, as defined by the California Building Code (CBC), creating a substantial risk to life or property. No impact would occur.

Under the No-Action Alternative there would be no landform alterations, and existing on-site buildings would remain unoccupied; therefore, Alternative F would not result in a substantial risk to life or property due to expansive soils. *No impact* would occur.

Seismicity

4.2.34 Alternative F would not expose people or structures to potential substantial adverse effects; including the risk of loss, injury, or death involving strong seismic activity and associated ground failure involving liquefaction or landslides/mudslides. No impact would occur.

Under the No-Action Alternative, no new structures would be constructed on the site, and existing structures would remain unoccupied and fenced to prevent public access; therefore, *no impact* would occur as substantial numbers of people or structures would not be exposed to adverse effects; including the risk of loss, injury, or death involving strong seismic activity.

Mineral Resources

4.2.35 Alternative F would not result in the loss or availability of a known mineral resource. No impact would occur.

Under the No-Action Alternative there would be no landform alterations; therefore, *no impact* would occur as Alternative F would not result in the loss or availability of a known mineral resource.

4.2.36 Alternative F would not result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan. No impact would occur.

Under the No-Action Alternative there would be no landform alterations; therefore, *no impact* would occur as Alternative F would not result in the loss or availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan.