IV. ENVIRONMENTAL IMPACT ANALYSIS
D. GEOLOGY AND SOILS

The following section is a summary of the geotechnical report conducted for the proposed project. The Limited Soils Engineering Investigation, Proposed Steel Building, 11320 Pendelton Street, Sun Valley, California (the "Geotechnical Report") was prepared by Geo Concepts, Inc., dated October 19, 2004. A copy of this report can be found as Appendix E to this Draft EIR.

ENVIRONMENTAL SETTING

The project site is located at the southwest and southeast corners of De Garmo Avenue and Pendleton Street, in the Sun Valley Community of the City of Los Angeles. The project site totals approximately 12.29 acres of land and is currently developed with an existing transfer station and non-permitted recycling activities. The proposed project would construct a 107,000-square-foot warehouse building to be located over the business' existing organics area, two roof structures, and a perimeter fence. Also, the project involves a revised solid waste facility permit, along with an expansion in permitted incoming tonnage, for the existing and non-permitted resource recovery and recycling operations.

Regional and Local Geology

Community Recycling and Resource Recovery Inc. is located in the northeast portion of the San Fernando Valley Basin adjacent to the Verdugo Mountains. The San Fernando Valley is an elliptical alluvium-filled basin approximately 23 miles long and 12 miles wide within the Transverse Ranges geomorphic province. Alluvium has been deposited from streams and rivers that have carried erosional debris from the surrounding upland areas. Specifically, the site lies within the Hansen Subarea of the San Fernando Valley Basin near the northwest tip of the Verdugo Mountains. The geologic units underlying the Hansen subarea are, from the youngest to the oldest: (1) Holocene Alluvium, (2) Pleistocene Alluvium, (3) Miocene sedimentary formations, and (4) Pre-Cretaceous crystalline and metamorphic rocks.

The Holocene deposits of alluvial and sediments, derived from the San Gabriel and Verdugo Mountains, were transported and deposited primarily by the washes draining Tujunga and La Tuna Canyons. These deposits consist primarily of uncemented light grey subangular boulders, gravel and sand; are approximately 50 to 75 feet thick, essentially unweathered, and do not have a significant soil horizon. The Pleistocene deposits consist of brownish to reddish-grey silty sand, cobbles, and boulders and are more than 500 feet thick, based on the logs of water wells 4916 and 4916A, located approximately 1,000 feet south of the Bradley West Extension.

The Miocene sedimentary rocks include the middle Miocene Topanga Formation and the upper Miocene Modelo Formation. Both formations consist of marine shales, siltstones, sandstones, and occasional conglomerates. The Topanga Formation also contains volcanic flows and breccia. The pre-Cretaceous crystalline and metamorphic rocks are primarily granitic rocks with dikes.

Seismic Conditions

The entire Southern California area is considered a seismically active region. Based on criteria established by the California Geological Survey (CGS), faults may be categorized as active, potentially active, or inactive. Active faults are those that show evidence of surface displacement within the last 11,000 years (Holocene age). Potentially active faults are those that show evidence of the last displacement within the last 1.6 million years (Quaternary age). Faults showing no evidence of displacement within the last 1.6 million years may be considered inactive for most purposes, except for some critical structures.

In 1972, the Alquist-Priolo Special Studies Zone Act (now known as the Alquist-Priolo Earthquake Fault Zoning Act) was passed into law. The Act defines "active" and "potentially active" faults utilizing the same age criteria as that used by the CGS. However, the established policy is to zone active faults and only those potentially active faults that have a relatively high potential for ground rupture. Therefore, not all faults identified as "potentially active" by the CGS are zoned under the Alquist-Priolo Act. The closest active fault is the Verdugo fault which is located approximately 2 miles from the project.

Subsurface Conditions

Field exploration of the site has been conducted several times since 1972. The most recent field exploration was conducted in March 2004 for this Geotechnical Report (included as Appendix E to this Draft EIR). Subsurface exploration was performed by a drill rig trenching into the underlying earth materials. The Plot Map (located in Appendix I of the Geotechnical Report, which is included as Appendix E to this Draft EIR) depicts locations of the subsurface explorations.

Previous grading has resulted in compacted fill placement on the subject site. Fill materials were presumably placed during backfilling of a gravel pit under the observation of Foundation Engineering circa 1972.[1] Fill was encountered in all of the borings ranging to more than 46 feet in thickness. Foundation Engineering Co. indicated a fill thickness from 30 to 50 feet. Fill consists of sandy clay, dark gray to dark brown, moist, stiff to hard, pieces of glass, pebbles and debris. Based upon field observations, laboratory testing and analysis, the compacted fill found in explorations should possess sufficient strength to support the proposed structure.

Landfill operations have also resulted in fill placement on the site. The fill did not contain significant amounts of vegetation or garbage. Debris within the fill consisted of metal, glass, brick and minor amounts of wood. The thickness of the landfill material encountered in explorations is depicted on the Plot Map. Due to the variability of the fill material, estimates of potential settlements are difficult. Previous investigations at the subject site indicate a potential settlement of 6 to 8 inches.

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[1] *De Garmo Pit, which was a municipal landfill used in the 1940's, and was closed in the early 1950s.*

Alluvial deposits underlie the fill. Alluvium primarily consists of sand, sand with abundant gravels, and cobbles. Based upon field observations, laboratory testing and analysis, the alluvium found in explorations should possess sufficient strength to support the proposed structure.

Groundwater

No active surface groundwater seeps or springs were observed on the subject site. The current subsurface exploration or previous exploration did not encounter groundwater to a depth of 46 feet. Seasonal fluctuations of groundwater levels may occur by varying amounts of rainfall, irrigation and recharge.

Liquefaction

Liquefaction involves the sudden loss of strength in saturated, cohesionless soils that are subjected to ground vibration and which results in temporary transformation of the soil into a fluid mass. If the liquefying layer is near the surface, the effects are much like that of quicksand for any structures located on top of it. If the layer is deeper in the subsurface, it may provide a sliding surface for the material above it. The effects of liquefaction include the loss of the soil's ability to support footings and foundations which may cause buildings and foundations to buckle.

ENVIRONMENTAL IMPACTS

Thresholds of Significance

In accordance with Appendix G to the State CEQA Guidelines, a project could have a potentially significant geology and soils impact if it were to cause one or more of the following conditions:

(a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:

  (i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map or based on other substantial evidence of a known fault;

  (ii) Strong seismic ground shaking;

  (iii) Seismic-related ground failure, including liquefaction;

  (iv) Landslides;

(b) Result in substantial soil erosion or the loss of topsoil;

(c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse;

(d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property; or

(e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water.

Based on the City of Los Angeles Draft L.A. CEQA Thresholds Guide, the proposed project would also result in a significant geotechnical impact if it exceeds the following threshold:

(f) A project would normally have a significant geologic hazard impact if it would cause or accelerate geologic hazards which would result in substantial damage to structures or infrastructure, or expose people to substantial risk of injury.

As discussed in Section IV.A., Impacts Found Less Than Significant of this Draft EIR and in the Initial Study (included as Appendix A to this Draft EIR), the proposed project would have no impact with respect to Threshold (e) listed above. As such, this section contains an analysis of Thresholds (a) through (d).

Project Impacts

Seismic Hazards

Ground Surface Rupture

The project site is located in the seismically active region of southern California. However, the project site is not located within an Alquist-Priolo Earthquake Fault Zone. No known active faults are mapped as crossing the project site or projecting towards the project site. On this basis, ground rupture due to faulting is not considered a significant hazard at the project site.

Ground Shaking

The principal seismic hazard to the proposed project is strong ground shaking from earthquakes produced by local faults. Modern, well-constructed buildings are designed to resist ground shaking through the use of shear walls and reinforcements. The proposed construction would be consistent with all applicable provisions of the City of Los Angeles Building Code, as well as the seismic design criteria contained within the Uniform Building Code. Although the project site is located by many other faults on a regional level, the potential seismic hazard to the project site would not be higher than in most areas of the City of Los Angeles or elsewhere in the region. As the entire Southern California area is considered a seismically active region, every building in the region is susceptible to groundshaking and earthquakes. The City of Los Angeles Building Code includes regulations and requirements designed to reduce risks to life and property to the maximum extent feasible. Therefore, the risks from seismic ground shaking are considered to be less than significant.

Liquefaction

Liquefaction involves the sudden loss in strength of a saturated, cohesionless soil (predominantly sand) caused by the build-up of pore water pressure during cyclic loading, such as produced by an earthquake. This increase in pore water pressure can temporarily transform the soil into a fluid mass, resulting in vertical settlement and can also cause lateral ground deformations. Typically, liquefaction occurs in areas where there are loose sands and the depth to groundwater is less than 50 feet from the surface. Seismic shaking can also cause soil compaction and ground settlement without liquefaction occurring, including settlement of dry sands above the water table. The subject site is not located within a liquefaction zone on the State of California Seismic Hazard Map and borings did not encounter groundwater at a depth of 46 feet. Therefore, the risks from liquefaction are considered to have a less than significant impact.

Landslides

The topography of the project site is relatively flat and the site is not located near any foothills or mountains, meaning that the possibility of landslides occurring on the project site is minimal. Therefore, the potential impact associated with landslides would be less than significant.

Erosion and Topsoil

Although project development has the potential to result in the erosion of soil during site preparation and construction activities, erosion would be reduced by implementation of appropriate erosion controls during grading. Minor amounts of erosion and siltation could occur during project grading, which would be collected in a controlled manner. Additionally, the potential for soil erosion during the operation of the proposed project is low due to the generally level topography of the area and the fully developed aspects of the project site at the completion of build-out. All grading activities require grading permits from the Department of Building and Safety, which include requirements and standards designed to limit potential impacts to acceptable levels, and all grading should also conform to the requirements of the City of Los Angeles Grading Division. In addition, all onsite grading and site preparation would comply with applicable provisions of Chapter IX, Division 70 of the Los Angeles Municipal Code which addresses grading, excavations, and fills. With implementation of the applicable grading and building permit requirements and the application of Best Management Practices, a less than significant impact would occur with respect to erosion or loss of topsoil.

Expansive Soils

Expansive soils are typically associated with fine-grained clayey soils that have the potential to shrink and swell with repeated changes in the moisture content. No such soils were found on the project site. With construction of the proposed project in accordance with the Los Angeles Building Code Chapter IX, a less than significant impact associated with expansive soils would occur.

Soil Stability

The proposed project will not require excavation, only boring for the installation of piers and piles to support the new building. As discussed above, studies reported a fill thickness of 30 to 50 feet. The fill consists of sandy clay, dark gray to dark brown, moist, stiff to hard, pieces of glass, pebbles and debris. Based upon field observations, laboratory testing and analysis, the compacted fill found in explorations should possess sufficient strength to support the proposed structure.

Due to the variability of the fill material, estimates of potential settlements are difficult. Previous investigations at the subject site indicate a potential settlement of 6 to 8 inches.

The alluvial deposits underlying the fill consist primarily of sand, sand with abundant gravels, and cobbles. Based upon field observations, laboratory testing and analysis, the alluvium found in explorations should possess sufficient strength to support the proposed structure.

The proposed building should be supported on foundations embedded into the alluvium or on foundations embedded into the existing compacted fill. All work should be conducted in accordance with the recommendations in the Geotechnical Report (see Appendix E to this Draft EIR). With the implementation of the recommendations in the Geotechnical Report, impacts associated with soil stability would be less than significant.

CUMULATIVE IMPACTS

Geotechnical impacts related to future development in the City would involve hazards related to site-specific soil conditions, erosion, and ground shaking during earthquakes. These impacts would be site-specific and would not be common to nor shared with the impacts on other sites. Furthermore, development of each of the related projects and the proposed project would be subject to uniform site development and construction standards that are designed to protect public safety. Therefore, cumulative geotechnical impacts would be less than significant.

MITIGATION MEASURES

The following mitigation measures shall be required to further reduce the already less than significant impacts of the proposed project:

D-1 Specific Requirements

- The proposed steel building shall be supported on foundations embedded into the alluvium or on foundations embedded into the existing compacted fill.

- The existing fill shall be removed and replaced as compacted fill to a depth equal to the depth of the proposed grade beam.

- The site shall be maintained by the operator as outlined in the Drainage and Maintenance section below.

Drainage and Maintenance

D-2 Maintenance of structures must be preformed to avoid serious damage and/or instability to improvements. Most problems are associated with or triggered by water. Therefore, a comprehensive drainage system shall be designed and incorporated into the final plans. In addition, pad areas shall be maintained and planted in a way that will allow this drainage system to function as intended. The following are specific drainage, maintenance, and landscaping requirements.

Pad Drainage

- Positive pad drainage shall be incorporated into the final plans. All drainage from the roof and pad shall be directed so that water does not pond adjacent to the foundations or flow toward them. All drainage from the site shall be collected and directed via non-erosive devices to a location approved by the building official. Planters placed adjacent to the structures shall be designed to drain away from the structure. Area drains, subdrains, weep holes, roof gutters and downspouts should be inspected periodically to ensure that they are not clogged with debris or damaged. If blockage or damage is evident, have it corrected.

Landscaping

- All slopes shall be maintained with a dense growth of plants, ground-covering vegetation, shrubs and trees that possess dense, deep root structures and require a minimum of irrigation. Plants surrounding the development shall be of a variety that requires a minimum of watering. A landscape architect shall be consulted regarding planting adjacent to improvements. It will be the responsibility of the property owner to maintain the planting. Alterations of planting schemes shall be reviewed by the landscape architect.

Irrigation

- An adequate irrigation system is required to sustain landscaping. Over-watering resulting in runoff and/or ground saturation must be avoided. Irrigation systems must be adjusted to account for natural rainfall conditions. Any leaks or defective sprinklers must be repaired immediately. To mitigate erosion and saturation, automatic sprinkling systems must be adjusted for rainy seasons. A landscape architect shall be consulted to determine the best times for landscape watering and the maximum amount of water usage.

Grading and Earthwork

D-3 Proposed grading will consist of removal and re-compaction of the upper fill and foundation excavations. All grading shall be carried forth as outlined below:

Flatland Grading

- Prior to commencement of work, a pre-grading meeting shall be held. Participants at this meeting will consist of the contractor, the owner or his representative, and the soils engineer. The purpose of the meeting is to avoid misunderstanding of the recommendations set forth in this report that might cause delays in the project.

- Prior to placement of fill, all vegetation, rubbish, and other deleterious material shall be disposed of off site. The proposed structures shall be staked out in the field by a surveyor. This staking shall, as a minimum, include areas for over-excavation, toes of slopes, tops of cuts, setbacks, and easements. All staking shall be offset from the proposed grading area at least five feet. The proposed construction shall be excavated down to a depth of the proposed grade beam.

- The natural ground, that is determined to be satisfactory for the support of the filled ground, shall then be scarified to a depth of at least six inches and moistened as required. The scarified ground shall be compacted to at least 90 percent of the maximum laboratory density.

- The fill soils shall consist of materials approved by the project Soils Engineer or his representative. These materials may be obtained from the excavation areas and any other approved sources, and by blending soils from one or more sources. The material used shall be free from organic vegetable matter and other deleterious substances, and shall not contain rocks greater than eight inches in diameter nor of a quantity sufficient to make compaction difficult.

- The approved fill material shall be placed in approximately level layers six inches thick, and moistened as required. Each layer shall be thoroughly mixed to attain uniformity of moisture in each layer.

  When the moisture content of the fill is three percent or more below the optimum moisture content, as specified by the Soils Engineer, water shall be added and thoroughly mixed in until the moisture content is within three percent of the optimum moisture content.

  When the moisture content of the fill is three percent or more above the optimum moisture content as specified by the Soils Engineer, the fill material shall be aerated by scarifying or shall be blended with additional materials and thoroughly mixed until the moisture content is within three percent or less of the optimum moisture content.

Each layer of fill material shall be compacted to a minimum of 90 percent of the maximum dry density as determined by ASTM D 1557, using approved compaction equipment. Where cohesion-less soil having less than 15 percent finer than 0.005 millimeters is used for fill, the fill material shall be compacted to a minimum of 95 percent of the maximum dry density.

- Review of the fill placement shall be provided by the Soils Engineer or his representative during the progress of grading. In general, density tests will be made at intervals not exceeding two feet of fill height or every 500 cubic yards of fill placed.

- During the inclement part of the year, or during periods when rain is threatening, all fill that has been spread and awaits compaction shall be compacted before stopping work for the day or before stopping because of inclement weather. These fills, once compacted, shall have the surfaces sloped to drain to one area where water may be removed.

  Work may start again, after the rainy period, once the site has been reviewed by the Soils Engineer and he has given his authorization to resume. Loose materials not compacted prior to the rain shall be removed and aerated so that the moisture content of these fills will be within three percent of the optimum moisture content.

  Surface materials previously compacted before the rain, shall be scarified, brought to the proper moisture content, and re-compacted prior to placing additional fill, if deemed necessary by the Soils Engineer.

Foundations

D-4 The proposed structure shall be supported on foundations embedded into the alluvium or existing compacted fill.

Existing Compacted Fill

The minimum continuous footing size is 12 inches wide and 24 inches deep into the compacted fill, measured from the lowest adjacent grade of compacted fill. Continuous footings may be proportioned, using a bearing value of 1500 pounds per square foot. Column footings placed into the compacted fill may be proportioned, using a bearing value of 1500 pounds per square foot, and shall be a minimum of two feet in width and 24 inches deep, below the lowest adjacent grade of compacted fill.

The bearing values given above are net bearing values; the weight of concrete below grade may be neglected. These bearing values may be increased by one-third for temporary loads, such as wind or semi seismic forces.

Lateral loads may be resisted by friction at the base of the conventional foundations and by passive resistance within the existing compacted fill. A coefficient of friction of 0.4 may be used

between the foundations and the compacted fill. The passive resistance may be assumed to act as a fluid with a density of 400 pounds per cubic foot. A maximum passive earth pressure of 5000 pounds per square foot may be assumed. For isolated poles, the allowable passive earth pressure may be doubled.

Alluvium

The minimum pile diameter is 24 inches. Piles shall extend into the alluvium a minimum of 5 feet. The piles may be proportioned using end bearing value of 4000 pounds per square foot.

All footing excavation depths will be measured from the lowest adjacent grade of recommended bearing material. Footing depths will not be measured from any proposed elevations or grades. Any foundation excavations that are not the recommended depth into the recommended bearing materials will not be acceptable to this office.

Lateral loads may be resisted by friction at the base of the conventional foundations and by passive resistance within the recommended compacted fill. A coefficient of friction of 0.4 may be used between the foundations and the compacted fill. The passive resistance may be assumed to act as a fluid with a density of 300 pounds per cubic foot. A maximum passive earth pressure of 4500 pounds per square foot may be assumed. For isolated poles, the allowable passive earth pressure may be doubled.

Settlement

D-5 Settlement of continuous footings is anticipated to be on the order of ¼ inches. Isolated footings shall have a settlement of ¾ inches. Differential settlement between the two foundation unit types is not expected to exceed ½ inches.

Excavations

D-6 Excavations ranging in vertical height up to four feet are anticipated for the grading. Conventional excavation equipment may be used to make these excavations. Excavations shall expose fill. These soils shall be trimmed back at 1:1 slope gradient. This shall be verified by the project Soils Engineer during construction so that modifications can be made if variations in the soil occur.

All excavations shall be stabilized within 30 days of initial excavation. If this time is exceeded, the project Soils Engineer must be notified, and modifications, such as shoring or slope trimming may be required. Water shall not be allowed to pond on top of the excavation, nor to flow toward it. All excavations shall be protected from inclement weather. Excavations shall be kept moist, not saturated, to reduce the potential for raveling and sloughing during construction. No vehicular surcharge shall be allowed within three feet of the top of cut.

Plan Review and Plan Notes

D-7 The final grading, building, and/or structural plans shall be reviewed and approved by the consultants to ensure that all mitigation measures are incorporated into the design or shown as notes on the plan.

The final plans shall reflect the following:

1. The Soils Engineering Investigation by GeoConcepts, Inc. is a part of the plans.
2. Plans must be reviewed and signed by the Soils Engineer.
3. All grading must be reviewed by the project Soils Engineer.
4. All foundations shall be reviewed by the project Soils Engineer.

Construction Review

D-8 Reviews will be required to verify all work. It is required that all footing excavations, seepage pits, and grading be reviewed by this office. This office should be notified at least two working days in advance of any field reviews so that staff personnel may be made available.

LEVEL OF SIGNIFICANCE AFTER MITIGATION

A less than significant impact would occur with respect to Geology and Soils. Implementation of Mitigation Measures D-1 through D-8 would further reduce the already less than significant impacts.