



Department of Conservation and Development
County Planning Commission
Wednesday, October 24, 2018 – 7:00 .P.M.

STAFF REPORT

Agenda Item # 2a.

Project Title:	Keller Canyon Landfill Land Use Permit Review
County File(s):	#LP89-2020
Applicant/Owner:	Keller Canyon Landfill Company / Republic Services
General Plan/Zoning:	Landfill (LF) / Heavy Agricultural (A-3)
Site Address/Location:	901 Bailey Road, Pittsburg – Bay Point area (APN: 094-060-008, 018, 019, 020 & 021)
California Environmental Quality Act (CEQA) Status:	Exempt. This action does not constitute a project since staff is not recommending any new or modified conditions of approval for the existing land use permit (LUP). This permit review and the preparation and proposed acceptance of the staff report are purely administrative in nature and not subject to CEQA per Section 15061(b)(3).
Project Planner:	David Brockbank, Senior Planner (925) 674-7794
Staff Recommendation:	RECOMMEND that the Board of Supervisors accept the permit review reports for the Keller Canyon Landfill LUP. (See Section II for Full Recommendation)

I. BACKGROUND

The County Planning Commission (CPC) continued Keller Canyon Landfill's (KCL) third annual LUP review for a fourth time on July 11, 2018. The first hearing, held on October 25, 2017, was continued to December 6, 2017, and continued a second time to January 10, 2018. The third continuation in January, to July 11, 2018, included a three-month update on April 11, 2018. The first, as well as the second continuance, was based on testimony from some of the residents living in the adjacent neighborhood that brought up various concerns associated with the landfill, including odor, dust, noise, visual impacts, seagulls, and litter. It was determined at the October 2017 meeting

that the CPC wanted more time to further review the issues and give staff time to prepare responses to questions from the CPC and the public. Staff's supplemental staff report in December addressed each of the concerns brought up by the local residents. At the December 2017 meeting, additional residents raised a number of similar concerns. The operator also made a presentation about landfill operations and provided information specific to previous concerns from the public. The CPC Chair then closed the public hearing and the commissioners began deliberations. The item was continued a second time.

Due to the number of complaints about the landfill from the community, the CPC was not prepared to move the KCL permit review on to the Board of Supervisors (Board). The CPC continued the hearing a third time to July 11, 2018. Staff was also directed to prepare a three-month status update in April 2018, informing the CPC and other interested parties about the landfill's progress on a number of possible odor reducing projects. Those projects included installing methane gas capture wells, working to move disposal activities to a new cell located one-half mile south and away from the residential neighborhoods. Staff recommended the fourth continuance in July in order for the landfill operator to complete the odor reducing projects, namely the construction of the new disposal cell. This report serves as the fifth staff report for KCL's third permit review.

II. RECOMMENDATION

- A. CONSIDER the information presented in the October 25, 2017, staff report, its Exhibit D – Compliance Table, as well as the staff reports from December 6, 2017, January 10, 2018, April 11, 2018, July 11, 2018, and this report to provide appropriate background and context necessary to satisfy Parts I and II of the 1995 Permit Review Criteria approved by the Board of Supervisors for KCL's Land Use Permit (File #LP89-2020).
- B. RECOMMEND that the Board of Supervisors ACCEPT this permit review report, in its entirety, prepared by staff for the KCL Land Use Permit, pursuant the 1995 Board approved Permit Review Criteria.
- C. RECOMMEND staff continue to work with the landfill operator on key milestones identified in Exhibit A, concurrent with the ongoing assessment of alleged disposal of potentially radioactive material from Hunters Point Naval Shipyard.

- D. RECOMMEND that the Board of Supervisors continue this permit review and DIRECT staff to return to either the Board or the CPC in late April 2019, to provide an update regarding progress on milestones and overall status of COA compliance.

III. STATUS UPDATE

Hunters Point Naval Shipyard (HPNS): On April 21, 2018, the San Francisco Chronicle published an article regarding material that may have been sent to KCL back in 2010-2011. The article alleges falsified documentation associated with radiological waste from HPNS that was sent to one or more landfills across the state, including KCL. Contra Costa Environmental Health (CCEH) acting as the Local Enforcement Agency (LEA), and the Department of Conservation and Development (DCD), are working with state and federal agencies in coordination with the landfill operator to investigate if any of the waste material in question was disposed at KCL. If radiological waste was sent to KCL, the investigation will examine if there are potential health concerns for employees and local residents and what, if any, remedial actions are necessary.

At the Board's direction, County staff prepared a brief report related to the allegations printed in the newspaper on May 1, 2018. At the end of May, CCEH put out a Request for Qualifications / Proposal (RFQ/P) in order to contract with a consultant to recommend the most appropriate means of assessing the landfill and surrounding community to detect the presence of any potential radioactive material that may have been disposed at KCL. During the May 1, 2018, Board meeting, District V Supervisor's Office requested a community meeting be held for residents of Pittsburg and Bay Point, with representatives from applicable federal, state and local agencies on hand to discuss the on-going investigation and future potential testing for radioactive material. CCEH organized a community meeting held on June 21, 2018, at the Ambrose Community Center in Bay Point. Experts from the Radiologic Health Branch of the state Department of Public Health, US Navy, San Francisco Regional Water Quality Control Board (RWQCB), and other state and local agencies were in attendance to speak and/or answer questions.

Over the course of six weeks, between the end of July through early September, the County conducted a solicitation process. This involved staff collaborating with the City of Pittsburg, the landfill operator, and a representative of the local community to review the RFQ/Ps received by CCEH and interviewing the qualified consultants. After some follow up inquiries were made, and responses received, a potential consultant was selected. The County intends to enter into a contract with the chosen consultant, subject to Board approval.

Odors: The landfill operator initiated several best management practices (BMPs), which started last spring, to address odors potentially migrating off-site. The operator has contracted with odor experts, installed odor suppression devices, and routinely monitors/inspects potential on-site sources, such as leachate tanks, as well as conducting regular odor investigations on- and off-site in response to complaints. Several members of KCL's staff are on the list of recipients for all odor complaints submitted through the County website, ensuring that the landfill operator is made aware of complaints as soon as they are submitted to the County. Since the last status update presented on July 11, 2018, eight odor complaints were submitted through the County's on-line system with the following monthly breakdown:

July 2018: 2 complaints

August 2018: 6 complaints

September 2018: zero complaints

During this third permit review, the CPC requested staff to research other landfills and solid waste facilities to determine what other facilities have used or are using to address odor issues. During the April and July permit review updates, the CPC requested staff to continue researching the effectiveness of installing tree lines/breaks to mitigate odors. Staff discovered a feasibility assessment of installing physical barriers to contain dust/odors at Sunshine Canyon Landfill (SCL) in Southern California. Republic Services (Republic) in March 2017, (attached as Exhibit B), authored this feasibility assessment. As part of an enforcement action issued by the local Southern California air district, Republic researched using vegetative and physical barrier systems to address odor and dust issues at the landfill. It was found that vegetative barriers such as tree-lined windbreaks of either single row or multiple rows of varied species may be effective in controlling windblown dust. Physical barriers such as earthen berms would be more effective addressing odor and visual impacts. The SCL used a combination of odor/dust BMPs that included the planting of trees on top of physical berms. Approximately 1,000 trees were planted along several earthen berms engineered near the entrance to the landfill to offset potential dust, visual, and odor impacts. The assessment states that using a combination of strategically placed earthen berms and a vegetation barrier did can enable air mixing for potential odor dispersion.

Vegetative Barrier: Under COA #20.2 – Odor Containment – DCD may require additional physical improvements or management practices as necessary to alleviate odor problems. Condition of approval #22.4 – Mitigation Berms – require the landfill developer to install landscaped mitigation berms (lift-level berms) in areas visible off

the landfill site to address visual quality. It is possible that planting a vegetative windbreak on a mitigation berm could be required without modifying the LUP. However, before moving forward in directing the construction of such improvements, several vegetation related factors should be considered in collaboration with CCEH and the landfill operator, including the following:

- Consulting / hiring a certified arborist;
- Assessing different species susceptibility to disease/pests, growth rates, suitability in/near landfill environment;
- Planting a single row versus multiple rows of mixed trees;
- Soil analysis;
- Adequate on-site irrigation

Planting a sizable vegetative windbreak consisting of multiple rows of trees will need proper irrigation and will most likely require connecting to municipal water as existing well water will not be a sufficient source. Bringing municipal water to the landfill site will necessitate the City of Pittsburg's involvement and authorization.

Extending Permit Review: The landfill operator and staff have agreed it would be best to extend this permit review through next year. Due to community concerns raised throughout this permit review, staff is recommending the following course of action before moving on to holding permit reviews every three years. The District V Supervisor has expressed interest in hearing staff update the full Board on the state of this third permit review. Staff anticipates new direction will likely be given to extend the permit review, potentially involving a referral back to the CPC after providing some time for staff to monitor the implementation of milestones outlined in Exhibit A, as well as for continued COA compliance. Therefore, it is staff's recommendation to extend the permit review and have staff report back to either the Board or CPC in late April 2019. The late April 2019 date was chosen because it will be after the winter season, which has been when the majority of odor complaints were submitted to the County and the Bay Area Air Quality Management District (BAAQMD) in the past two years. Staff's goal between the time of receiving new direction from the Board and the late April 2019 continuance is to monitor the effectiveness of recent improvements for odor mitigation, before determining the potential need to add or modify conditions in the LUP.

Litter: In late July, after the last permit review update, three litter complaints were submitted to the LEA and/or DCD. Staff investigated the litter complaints and forwarded the complaints to the operator to address on-site clean-up. The complaints

could not be confirmed, as the submitted photo evidence did not show litter blowing off site or through the neighborhood.

The operator regularly maintains a litter crew on-site to clear debris from the litter fences, but also collects litter from the buffer areas (open hillsides surrounding the disposal area). On windy days, the operator will increase the size of the litter crew as needed. It is known that this area of the County, especially near the landfill, experiences regular high winds. High wind speeds can make it challenging to control litter. The landfill operator is responsible for controlling and containing the litter on-site and are required to remove litter from the litter fences daily. Since the LEA and the operator already receive email notifications of odor complaints through the County's online complaint form, DCD staff is exploring potential for modifying the online complaint form to provide for submittal of litter complaints. Additionally, the complaint form may use a feature that allows for the uploading of digital photos. Staff hopes to implement these modifications before the end of the year. Meanwhile, staff will continue to work with the operator to address any litter issues. If staff receives a litter complaint not related to odor, we will forward that complaint to the operator and the LEA, and respond to the complainant as well.

Visual: The operator accelerated the scheduled construction of disposal cell Phase 2E, to move away from the previous disposal cell, Phase 3B1 cell, where the anaerobic compost material was disposed. Construction of Phase 2E was completed in August of this year. The new cell started being used for disposal in the middle of September. Relocating from Phase 3B1 to Phase 2E increases the distance between the nearest residential neighborhood and the active disposal cell by approximately 0.5 miles. Moving the disposal activity further from sensitive receptors should address odor issues, potential noise impacts, and active landfill operations. Trucks entering and leaving the landfill continue to be visible along the main access road.

Condition #22.3 – Toe Berm – shall be designed to screen the access road, while COA #22.4 – Mitigation Berms – are intended to screen landfill disposal activities. Now that active disposal moved to Phase 2E, the operator can focus on the feasibility study for increasing the height of the Toe Berm per design, and examine the placement of future mitigation berms. Per attached Exhibit A, the 2018/19 Timeline of Scheduled Improvements has been updated to include an extra milestone of developing engineering design plans for future berms required to mitigate visual impacts. Building up the Toe Berm and installing new mitigation berms will also help to minimize future odors, noise, and dust impacts. Extending this permit review will also allow time for the operator to provide updates and continue working on the key

2018/19 improvement milestones while staff continues monitoring effectiveness of recent installations and overall COA compliance. Having staff report back in late April 2019 will keep the public and local community apprised of progress at the landfill.

Noise: Staff has not received any noise complaints about the landfill since March 2018.

IV. CONCLUSION

Staff recommends that the CPC accept this fifth staff report on the third permit review for KCL's use permit, and recommends taking the report(s) to the Board for an update.

Additionally, staff recommends the CPC request that the Board of Supervisors to continue this permit review and direct staff to report back to the CPC or Board in late April 2019.

Exhibit A: 2018/19 Timeline of Scheduled Improvements at KCL

Exhibit B: Assessment of the Feasibility of Installing Physical Barriers and or Dust/Odor Containment Structures – March 2017

EXHIBIT A*CPC – October 10, 2018*

Improvement Milestone	Status	Targeted Start Date	Targeted Completion Date	Comments
Gas Collection & Control System	COMPLETE	March 2018	May 2018	26 New methane gas extraction wells online and functioning per design.
Replacement Flare Station Upgrades	Electrical Upgrade COMPLETE. Building permit In Progress	Autumn 2018	Spring / Summer 2019	Blower skid being fabricated, and under building permit review. This will provide greater landfill gas collection capacity. BAAQMD reviewing emission calculations.
Phase 2E Design	COMPLETE	December 2017	April 2018	Design Report submitted in December 2017, and approved in April 2018 by RWQCB.
Phase 2E Construction	COMPLETE	March 2018	August/September 2018	RWQCB and County approved in August 2018. In use starting September 2018.
Toe Berm / Mitigation Lift Level Berms Feasibility Study	In Progress	Autumn 2018	December 2018 / January 2019	Fiscal year resources dedicated to new Phase 2E construction. Study of Toe / Mitigation berms to follow. Requires assessment of future berm plans compared to phasing plan.
Berm Engineering Design Plans	PLANNED	January 2019	Spring 2019	To be started while Feasibility Study is under County review. The Engineering Design Plans require review and approval of DCD in accordance with COAs 22.3 - 22.4
Berm Construction	PLANNED	Summer 2019	Autumn 2019	Construction of mitigation berms completion date dependent on permissible weather. Increasing height of Toe Berm is a phased project.

ASSESSMENT OF THE FEASIBILITY OF INSTALLING PHYSICAL BARRIERS AND OR DUST/ODOR CONTAINMENT STRUCTURES

SUNSHINE CANYON LANDFILL

MARCH 2017



PREPARED BY

Republic Services
Sunshine Canyon Landfill
14747 San Fernando Road
Sylmar, California 91342

1.0 BACKGROUND

This report addresses Condition 16 of the Abatement Order (Case 3448-14) (Abatement Order) issued by the South Coast Air Quality Management District (SCAQMD) on December 15, 2016 to Browning Ferris Industries of California, Inc. (BFIC) for the Sunshine Canyon Landfill (SCL). SCL, located in Sylmar, California, is wholly-owned and operated by BFIC.

Condition 16 of the Order states the following:

“Respondent shall submit to the District, within ninety (90) days of the issuance of this Order, an assessment on the feasibility of installing physical barriers and or dust/odor containment structures. The assessment shall include an estimated timetable for improvements at the entrance road, including consideration of a large physical visual berm lined with trees along the final realigned access road along with other physical barriers (or containment systems) that can serve as a physical barrier to mitigate odors (e.g., controlled air movement, creating additional air turbulence or dispersion along odor travel pathways, additional odor adsorption)”.

2.0 SUNSHINE CANYON LANDFILL SITE AND ENVIRONS

The Sunshine Canyon Landfill (SCL) is an operating Class III municipal solid waste sanitary landfill located partially within the Sylmar area of the City of Los Angeles and partially within the unincorporated area of Los Angeles County (Figure 1).

The site property comprises 1,036 acres. The current operating permit for the combined City/County Landfill site encompasses 363 active acres for disposal with 178 acres in the County, and 185 acres in the City. In addition to the active permitted landfill areas on the site, there are two closed waste management units (WMU) on the City side comprising of approximately 86 acres. The two WMU’s were closed in late 1990’s with a final cover system constructed per the regulations in effect at the time of closure.

FIGURE 1 - Sunshine Canyon Landfill Vicinity and Environs



A gas collection and control system (GCCS) is operating on all active and closed units at the landfill site. This system employs over eight hundred landfill gas wells and miles of collection piping to serve four enclosed flare units for methane oxidation. There is also a 22.5 megawatt landfill-gas-to-energy plant (LFGTE) which combusts approximately 8,300 standard cubic feet per minute (SCFM) of methane gas.

The landfill is situated southwest of the Newhall Pass, in the northern corner of the San Fernando Valley, in a box canyon which opens to the south within the community of Sylmar, and just east of the community of Granada Hills (both communities situated in City of Los Angeles proper). The landfill mound is situated within the box canyon and is visually blocked from view of Granada Hills by a ridge line running northwest-southeast north of Balboa Avenue (herein called the 'Southern Berm').

As of the date of this report, active landfill operations occur on 156 of the 178 acres of the County portion of the site, and 85 of the 195 acres on the City portion of the site. Landfilled

areas that are closed with final cover in place total 155 acres (138 acres for City South and 17 acres for City North).

3.0 METEOROLOGICAL AND OPERATING CONDITIONS

3.1 Meteorological Conditions

A meteorological study was prepared in 2011 by Environ International Corporation of Novato, California and eta-Partners of Groton, Massachusetts. This study was conducted in response to a prior Abatement Order (Case 3448-13).

The goal of the meteorological study was to “gain sufficient understanding of the flow patterns around the landfill to allow the design of mitigation measures that will ultimately improve control of odors from the landfill”.

The report concluded:

“Based on all local, mesoscale and synoptic meteorological analyses conducted in this study, we have developed the following conceptual model of the odor transport couple between Sunshine Canyon Landfill and the residential neighborhoods to the south:

- Calm, stagnant or weakly forced flows set up over Southern California;
- A weak to moderate Santa Ana condition may form, in which a shallow surface flow moves south from the Antelope Valley and accelerates through the Newhall Pass;
- Odor events are most common during clear conditions in which radiative cooling of the local terrain generates drainage flows that augment the northerly [sic] flow through the pass;
- Nocturnal cooling maintains a vertically stratified environment, but northerly winds likely increase mixing via mechanical turbulence and direct odors directly southward and down arroyos to residential areas;
- The subsiding cool air from the Landfill pools in the Van Gogh “pocket”, thereby inhibiting mixing or evacuation of odors;
- This stable flow regime is at maximum strength in the morning and together with increased population activity during 6-10 AM leads to a surge in odor complaints”.

The meteorological study identifies two distinct travel pathways for possible odor conveyance from the site:

Pathway 1: when aided by a north wind, air travels over City South Landfill unit, crosses a natural separating ridgeline (the Sunshine Canyon “Berm”) at elevations 1720 to 1780 above mean sea level (MSL), and then ultimately pools by inversion in some residential areas of Granada Hills North.

Pathway 2: under normal stagnant flow, with nighttime cooling, air drains south along the Sunshine Canyon bottom and ultimately exits the facility in the vicinity of the entry gate on San Fernando Road and low areas along the Interstate 5/State Route 14 freeway junction.

FIGURE 2 - EXCERPT FROM METEOROLOGICAL STUDY ^[2] IDENTIFYING TRANSPORT PATHWAYS

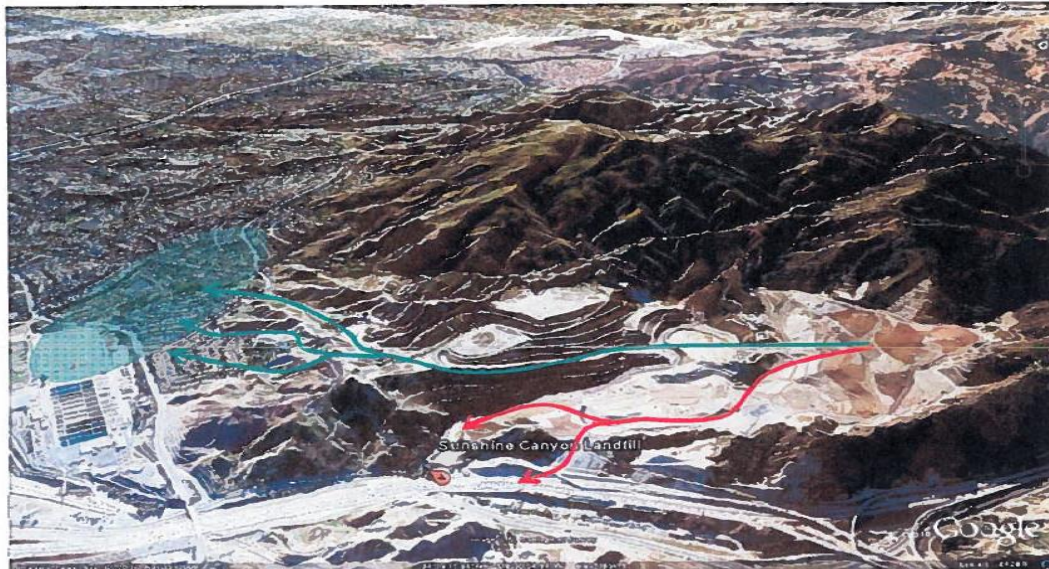


Figure 22. Schematic depiction of the conceptual model describing transport paths under two statically stable (nocturnal) scenarios: (green) moderate northerly wind regime moving air directly south and channeling down arroyos to the south of the Sunshine Canyon “Berm”, ultimately pooling in the Van Gogh area of Granada Hills North; (red) weak/calm wind regime dominated by slower drainage flow that channels odors along the floor of Sunshine Canyon and out to the I-5 corridor. For illustration purposes the center of the landfill was used for this schematic but it is not intended to represent a known emission point. The model used for these pathways is strictly conceptual and will be refined during remaining work tasks.

3.2 Current Operating Conditions

Current operating conditions at the site occur in three distinct areas: County deck areas; City/County unit CC3B Part 2 liner fill which is presently occurring from 1680 to 1820

MSL; and new operations that will begin in CC4 Part 1 in April 2017 at starting elevation of 1570. Based on the meteorological study, operations which occur at higher elevations pose potential for migration of odors to both meteorological pathways, whereas lower operating elevations would typically pose odor migration primarily to Pathway 2.

4.0 EXISTING ODOR AND DUST CONTROL MEASURES

4.1 Existing Odor Control Measures

This section presents the odor control measures that are currently in use at SCL. Landfills employ operational techniques and engineered systems to control gas emissions and associated odors at the site. At SCL the following techniques and systems are in place:

4.1.1 Operations

- Waste operational areas are covered nightly with either the approved alternative daily cover (ADC) or 9 inches of compacted soil cover;
- Odor neutralizer is sprayed at the active disposal area downwind of the activity with dust suppressor equipment;
- An odorous load management practice is in place to handle odorous loads expeditiously or reject loads that are considered too odorous to accept;
- Surface emission monitoring is conducted at the landfill on a monthly basis in accordance with regulatory requirements. Areas of exceedance are responded to with additional soil cover and/or adjustments to the wellfield to promote additional collection of the landfill gas in that area within the permitted timeframe;
- Additional soil has been placed on intermediate cover areas.

4.1.2 Barriers and Controls

- A landfill gas collection and control system (GCCS) is installed on all active and closed landfill units at Sunshine Canyon Landfill. This system of over eight hundred wells and collection pipes, conduct landfill gas to treatment points on the landfill (4 flare stations and a LFGTE plant) which treat the landfill gas through thermal oxidation. All aspects of the system are permitted for operation by SCAQMD and the site's Title V permit. Periodic monitoring reports for the system are submitted to SCAQMD.
- Odor mitigation equipment is employed at the active working face (Buffalo Monsoon units) and also on the Southern Berm portion of the site. These

units use a mixture of water and odor deodorizer to provide a deodorizing mist.

- Odor neutralizer is sprayed on the access entry road at 20 feet above road grade from a pole-installed mister system.
- Deodorizer is released in vapor systems along the Sunshine Canyon Southern Berm on City South, along San Fernando Road north and south of the entry road, and on the ridge area above San Fernando Road along the oilfield road near the southerly property boundary.

4.2 Existing Dust Control Measures

Dust control at the landfill is primarily achieved through the application of water sprayed on roads and other areas of the landfill where dust is generated through normal landfill activities or during construction.

A vegetative berm was installed on the Southern Berm in accordance with City of Los Angeles Q-Condition C.10.b(1) which requires the planting of 1,000 trees to buffer particulate matter (PM10) from lands to the south of the site which include residential neighborhoods. A total of 1,038 were originally planted by landfill personnel for the PM10 berm. Republic Services voluntarily agreed to monitor the health and mortality of the PM10 trees for a 5-year monitoring period. The monitoring was conducted by a certified arborist, and annual monitoring reports were submitted. The final annual monitoring report submitted in January 2015 found the following:

- Trees planted for PM10 mitigation consist of Coast Live Oaks (*Quercus agrifolia*);
- A total of 1,034 were in good to fair condition;
- Trees planted in the eastern portion of the mitigation area are exposed to high winds resulting in sparse canopies and have a slower growth rate;
- Most of the trees not as exposed to high winds are healthy and vibrant.

Figures 3 and 4 present current pictures of the portion of the PM10 berm area at the ridgeline level. It should be noted that the PM10 tree planting area extends below this ridgeline to the south. The PM10 trees are monitored on a routine basis for health by on-site nursery personnel and routine maintenance (weeding) of this area is conducted. When necessary, trees are replaced in kind to maintain the integrity of the system.

FIGURE 3
PM10 SOUTHERN BERM SUNSHINE CANYON LANDFILL
VIEW LOOKING WEST



FIGURE 4
PM10 SOUTHERN BERM SUNSHINE CANYON LANDFILL
VIEW LOOKING SOUTHEAST



5.0 FEASIBILITY OF INSTALLING PHYSICAL BARRIERS AND/OR DUST/ODOR CONTAINMENT STRUCTURES

The performance characteristics of physical barriers and structures are to:

1. Control air movement
2. Create air turbulence
3. Promote dispersion along odor travel pathways
4. Odor adsorption, absorption and oxidation

Physical barriers rely on higher wind speeds to interrupt air flows and create turbulence leeward of the barrier. Numerous studies for agriculture and livestock uses promoted by the U.S. Department of Agriculture (USDA), U.S. Environmental Protection Agency (USEPA) and National Resources Conservation Services (NRCS) indicate that the range of turbulence is related to the height and permeability of the barrier, as well as wind speed. Barriers with sharper angles such as walls, promote more turbulence in comparison to rounded earthen berms. A synthesis of the available literature identifies that the influence of a barrier to create turbulence and mixing is approximately 3 times its height immediately downwind and it can influence wind speed and direction to a lesser degree for a horizontal distance 5 times its height upwind and 20 times its height downwind. Adsorption, absorption and oxidation barriers using strategically placed vegetation rely on lower wind speed to be effective to allow the particles to adsorb to the surface of the barrier.

The following barrier systems have been researched for their application at Sunshine Canyon Landfill.

5.1 Vegetative Barrier Systems

Landfills can employ the use of strategically placed earthen berms which, when accompanied by a barrier system of vegetation (trees, shrubs, hedges), can mimic the performance of barrier walls for the purpose of enabling air mixing for potential odor dispersion. Design guidance documents from the USDA and NRCS suggest that windbreak or shelterbelt barriers be comprised of multiple species due to the expectation that in the future some disease may claim one of the species thereby thinning the row. In addition, the windbreak or shelterbelt barriers should be multiple rows of differing heights and spacing to provide a more impermeable break, and finally that a plan for future thinning of the wind break be employed as the trees mature to keep the unit healthy and thriving.

Examples of single-line and multiple-line vegetative barrier systems are shown in Figures 4 and 5 below.

FIGURE 4 - SINGLE ROW TREE-LINED WIND BREAK



FIGURE 5 - SHELTERBELT WITH MULTIPLE SPECIES



5.2 Physical Barriers

Being an active disposal site, the installation of a passive control system such as a physical barrier is limited to areas at SCL that are either outside of the operating landfill permit boundary or areas within that boundary which have reached final design grades. Over the next four years (2017 through 2020), new entrance improvements relating to construction of the front Entry Berm area will be constructed which will entail the construction of a portion of the future permitted stability berm, with paved roads, new drainage conveyances, and temporary facilities for operation of truck scales along with portable buildings for operations, administration, and other office accommodations. The construction of this Entry Berm is considered the most feasible physical barrier system that can be constructed at the site due to the following constraints in other areas of the site:

- Sunshine Canyon Landfill is an active landfill. Daily waste receipt and processing operations are conducted to reach permit grades by the conclusion of the permit, which is presently January 29, 2037 on the County portion of the site. Therefore, areas that are within the permit limit boundary have not yet achieved final elevation, and making construction or placement of any type of permanent physical barrier such as a windbreak or shelterbelt, is not possible in the near term. For example, construction of wind breaks arranged normal to the prevailing wind pattern that may be effective for air dispersion would require a change to the final grading. This change would require regulatory approval from multiple regulatory agencies as a change of final grading to the Closed City South portion of the landfill would be required for the installation of the windbreak or shelterbreak;
- Any windbreak proposed on County Deck areas that have reached final elevation would likewise need additional approval from multiple regulatory agencies such as the Los Angeles County Department of Regional Planning and the Los Angeles County Department of Public Works – Environmental Programs Division (LACDPW-EPD).

6.0 PROPOSED PHYSICAL BARRIERS AND/OR DUST/ODOR CONTAINMENT STRUCTURES

6.1 Entry Berm Improvements as a Physical Barrier

The entry berm improvements will be the construction of a portion of the permit grading plan terminal stability berm. Drawing 1 presents a three-dimensional perspective for the Entry Road project. As shown, upon final construction, the entry berm will be an earthen berm with paved roads, new drainage conveyances, and temporary facilities for operation of truck scales along with portable buildings for operations, administration, and other office accommodations. As

shown on Drawing 1, this entry berm will be constructed such that it will change the configuration of the front portion of the site to create a physical barrier for potential air flow drainage as identified as Pathway 2 in the meteorological study.

This project will construct grading on an interim location for the purpose of temporarily siting the scale facilities for the next 15 years of operation. This project will be constructed in two phases as follows:

- (1) The first phase will place approximately 600,000 cubic yards of soil for the stability berm. This will be a grid-reinforced earthen fill which will shape the new entry road and tree-lined screening berms. This project will allow traffic to utilize the current entryway while the Phase 1 fill is underway.
- (2) The second phase of the project will be the paving of the new road, tie-over of customer traffic to the new alignment, and the completion of the geo-grid fill with an additional 300,000 cubic yards to complete the overall project.

Presently, this project is scheduled to begin in calendar year 2017 with completion in 2018, however local permit review by the City of Los Angeles is required. Therefore, the start of construction is predicated on their review. Given the permit evaluation period with the City is unknown, the project may slip one year for start in 2018 and completion in 2019.

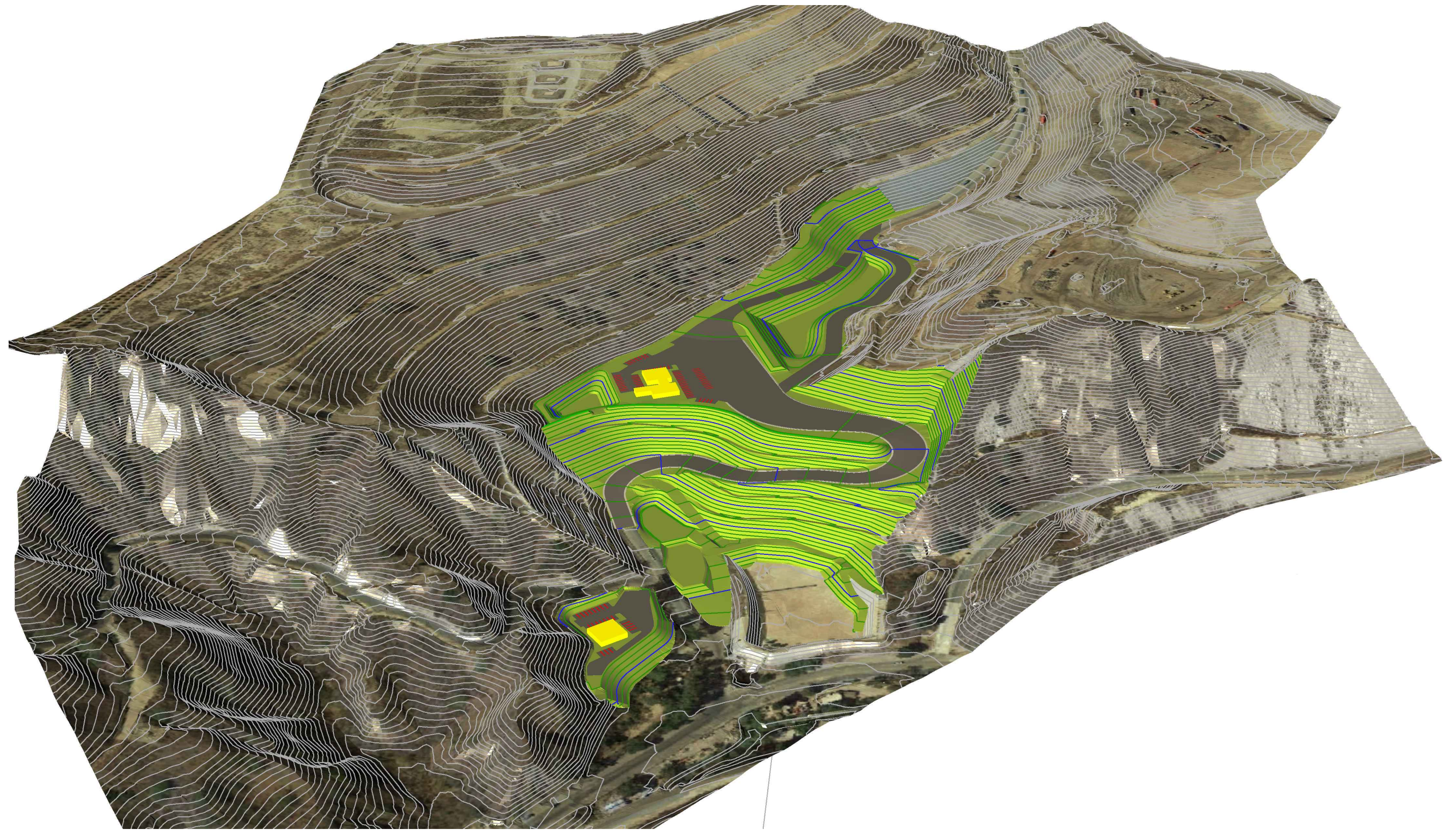
6.2 Windbreaks on the Southern Berm and Oil Field Road

Tree-lined windbreaks are proposed along the Southern Berm area of the City South portion of the site and along the ridgeline adjacent to the oil field road near the south boundary of the property. These windbreaks are proposed to be planted with fast-growing western trees with suitable hardiness to attain a 40'-50' height, and of a species mix to be confirmed by an arborist in recognition of the site's soil characteristics and climate zone. In both locations, a drip irrigation system will be installed to aid the establishment of the tree line. Locations of proposed windbreaks are presented on Drawing 2.

REFERENCES

- [1] South Coast Air Quality Management District (2016) Findings and Decision for Petition for a Stipulated Order for Abatement; December 15, 2016; Case No, 3448-14.
- [2] Environ International Corporation, Novato, California; eta-Partners, Groton, Massachusetts; (2011) "Meteorological Study of the Sunshine Canyon Landfill"; SCAQMD Order 3448-13.

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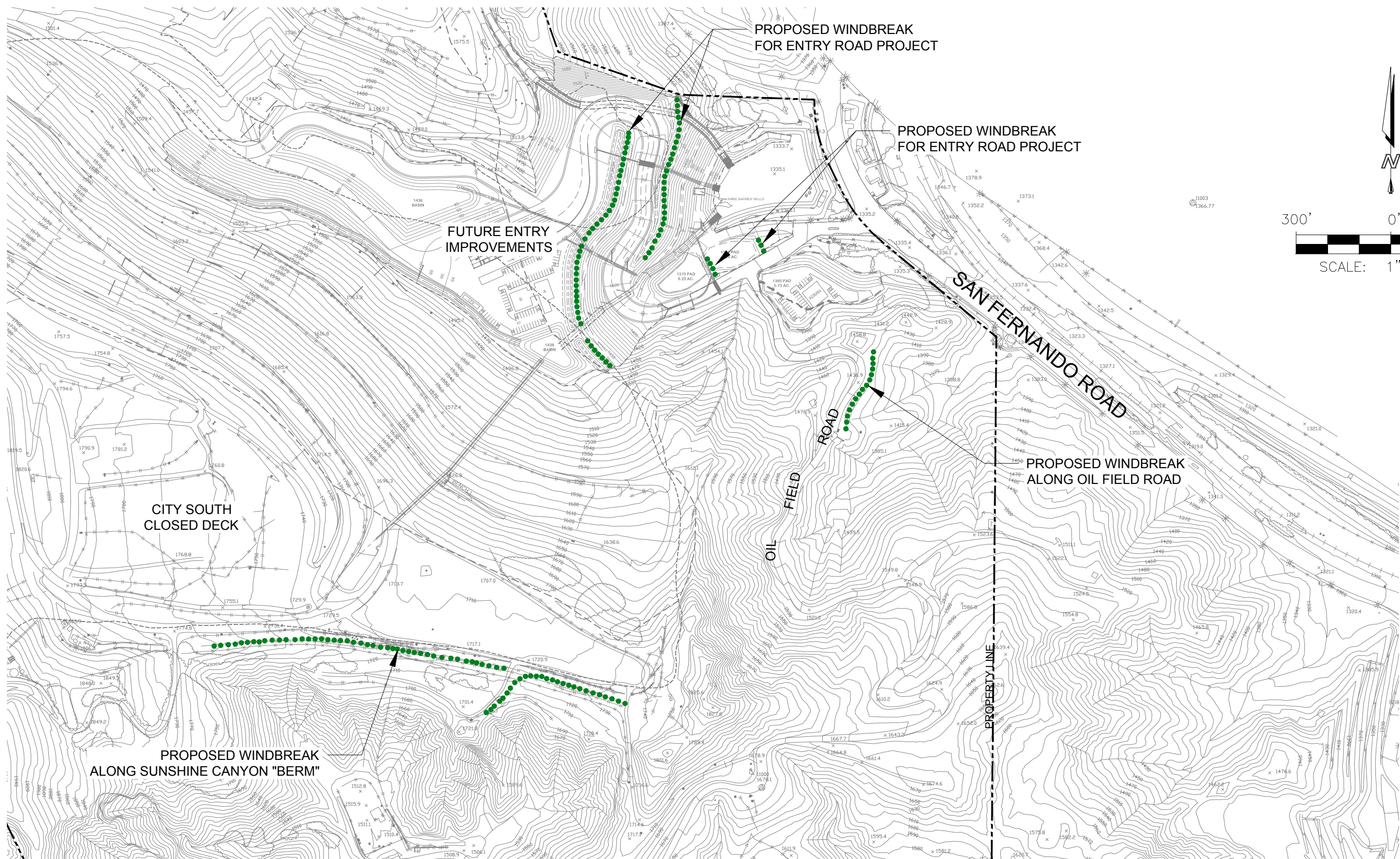


DRAWING 1

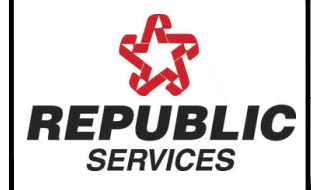


SUNSHINE CANYON LANDFILL
ODOR BARRIERS FEASIBILITY ASSESMENT
MARCH 2017

ENTRY ROAD PERSPECTIVE VIEW



DRAWING 2



SUNSHINE CANYON LANDFILL
ODOR BARRIERS FEASIBILITY ASSESMENT
MARCH 2017

PROPOSED WINDBREAKS