APPENDIX B

ODOR IMPACT MINIMIZATION PLAN

BEE CANYON GREENERY
ODOR IMPACT MINIMIZATION PLAN

1.0 PURPOSE

In accordance with California Code of Regulations Title 14, Section 17863.4 (as of January 2016), compostable material handling operations and facilities shall prepare, implement, and maintain a site-specific odor impact minimization plan. This Odor Impact Minimization Plan (OIMP) is being submitted by OC Waste & Recycling to the County of Orange, Health Care Agency/ Local Enforcement Agency (LEA) as required and shall be implemented in minimizing impact of odors to potential receptors as the need arises. The plan is intended to provide guidance to on-site personnel in the handling, storage, and removal of compostable materials at the Bee Canyon Greenery (BCG) composting facility located within Frank R. Bowerman Landfill (FRB). This odor impact minimization plan shall be reviewed annually to determine if any revisions are necessary, a copy shall be provided to the LEA, within 30 days of those changes.

Facility Information

Site Name:	Bee Canyon Greenery
SWIS#:	30-AB-0469
Location:	11002 Bee Canyon Access Road, Irvine, CA 92602
Operation:	Compostable Material Handling Facility
Process:	Open windrow/covered aerated static pile (CASP) methods
Capacity:	Phase 1A - Not to exceed 73,925 cubic yards; Phase 1B – Not to exceed 129,111 cubic yards; Phase 1C – Not to exceed 121,725 cubic yards
Project Area Size:	37.3 acres

2.0 ODOR MONITORING PROTOCOL

2.1 PROXIMITY OF ODOR RECEPTORS

The project area is located within the Frank R. Bowerman Landfill and odors coming from the composting operation may have an impact to both on-site and off-site receptors. Below is a list of potential receptors:

1. Potential On-Site Receptors

    a. Landfill site personnel
    b. On-site contractors
    c. Transfer truck and material delivery drivers
    d. Public utility personnel

2. Potential Off-Site Receptors (and corresponding distance away from composting project area, See Figure 1)

    a. Residential neighborhoods – approximately 3,700 to 4,900 linear feet (~1 mile) south – southwest of the project area.

2.2 METHOD FOR ASSESSING ODOR IMPACTS

Each operating day designated on-site personnel shall assess and evaluate the perimeter of the facility area and landfill boundary for objectionable odors. Best Management Practices (BMPs) and good housekeeping measures are implemented to minimize the release of objectionable odors. BMPs include:

- Maintaining adequate heat in the piles through appropriate pile density, limiting turning frequency and/or pile dimensions.
- Providing adequate moisture throughout the active composting process.
- Frequent monitoring of temperature and moisture content assures composting conditions are within acceptable parameters.

Good housekeeping measures include:

- Clearing spilled materials between windrows.
- Eliminating areas with the potential for ponding water.
- Maintaining reasonably sized stockpiles of incoming feedstock by typically deploying it into windrows within 48 hours.

If objectionable odors are detected, the following assessment methods shall be implemented:

1. Cease or limit the amount of new feedstock received if they are causing off-site odor impacts until the source of the odors is identified, corrected and the odor migration ceases.
2. Designated site personnel shall investigate likely source of odors.
3. Designated site personnel shall determine wind patterns and

direction at time odor was detected.

4. Based on the intensity of odor nuisance, designated site personnel shall determine if odor had travelled off-site by surveying the perimeter of the landfill and vicinity of potential off-site receptors.
5. If source of odors is found to be the composting project area, determine the effectiveness of current on-site management practices (e.g., mixing odiferous materials with sawdust or other bulking agent, remove odiferous materials and dispose of them in the landfill, etc.) could remedy any odor problems and immediately take steps to remedy the situation. (See Table 1 for Possible Causes of Odor and Odor Minimization Management Techniques)
6. Determine whether or not the odor has moved off-site and if so, if it is significant enough to warrant contacting the adjacent neighbors and/or the LEA.
7. The LEA shall be notified if it has been determined that possible odor impacts has occurred beyond the landfill property boundary.
8. If possible, odor impacts have been determined to occur beyond the property boundary, the incident shall be recorded in the compost daily operational log book which shall include all actions and activities taken to resolve or minimize odor nuisance for future reference and operational considerations.
9. Do not start operations again (i.e., accepting additional green waste in receiving area, placement and formation of new windrows) until the wind and meteorological conditions are favorable and will not promote off-site odors.

3.0 METEOROLOGICAL CONDITIONS

Prevailing winds at FRB predominantly come from the south or southeast starting approximately from 8 PM through 8 AM with wind speeds ranging from 1 to 6 mph. During daylight hours, prevailing winds shift and come from the north to southwest approximately from 8 AM through 6:30 PM with wind speeds ranging from 1 to 13 mph (See Exhibit 1 containing wind roses obtained from the nearest weather station to the project area for various times of the year). Typical daytime wind directions will direct any potential odors south-southwest away from potential receptors. Santa Ana wind conditions do affect the site in the fall months approximately 20% of a three month period as can be seen in Exhibit 1 and are in the same direction as the typical daytime wind directions albeit at higher wind speeds.

The FRB Landfill maintains an onsite meteorology station that monitors wind direction, wind speed, temperature, and relative humidity. Data from this station may be used to help monitor conditions if an odor issue arises or prior to an issue occurring.

4.0 COMPLAINT RESPONSE PROTOCOL

As complaints are received from impacted receptors or regulators, the following response protocol shall be implemented:

1. All odor complaints received from potential receptors and/or regulators shall be recorded in the facility operational logbook and complaint log (See Exhibit 2 for Complaint Log).
2. Designated personnel shall contact complainant and/or regulator to obtain details of the complaint such as name, time, location, and nature or characteristics of odors.
3. Designated personnel shall notify appropriate regulators of the complaint.
4. Designated site personnel shall investigate and implement methods in assessing odor impacts as described in Section 2. Odor Monitoring Protocol, of this plan.
5. Designated site personnel shall immediately implement additional or appropriate measures to minimize odors.
6. Once the OIMP has been implemented and the odor has been minimized, designated personnel shall follow-up with complainant.

1. All complaint records for the quarter shall be included and incorporated into the Quarterly Self-Monitoring report submitted to the LEA as required.

OCWR will establish contingency plans for operating downtime (e.g., equipment malfunction, power outage). OCWR shall post telephone numbers at the entrance of the composting facility to allow members of the public to contact the composting facility superintendent to report odor complaints 24 hours per day, 7 days per week.

5.0 OPERATING PROCEDURES AND DESIGN CONSIDERATIONS TO MINIMIZE ODORS

Operational procedures and design considerations have been taken into account to minimize odor impacts as a result of the composting facility.

5.1 FEEDSTOCK CHARACTERISTICS AND MANAGEMENT

Feedstock is limited to greenwaste, horse manure, vegetative food materials and

food materials (non-vegetative) which have already undergone stages of sorting, screening, and grinding prior to its delivery to the BCG and is expected to emit very minimal odors as it undergoes deployment into windrows and the composting and curing process. Some feedstock may arrive at the facility which has not yet been processed; however, effort will be made to process those feedstock material types and form into windrows as quickly as possible. This will require first in, first out approach to ensure each load is earmarked as to when it arrived and when it needs to be processed. While the feedstock is waiting to be "officially" processed, some pre-monitoring can be done such as temperature monitoring to ensure the feedstock has not gone sour due to anaerobic degradation.

The material arriving for the compost feedstock will be source separated. The degree of source separation may vary depending on the type of technology utilized for composting. For example, in the case of windrow composting, material arriving will be source separated primarily consisting of a single material type (i.e., green waste vs. manure). At this point in time OCWR is not planning to receive mixed organic waste if the feedstock will be processed using the open windrow technology. For composting using the CASP system, the intent is also to receive it source separated of a single material. However, there is the potential that the feedstock could consist of multiple organic material types and still be considered source separated depending on the method of collection as established by the hauler and jurisdiction. For example, some food scraps may be mixed in with the green waste. The CASP will be able to effectively receive this material type while controlling odors and vectors. Mixed solid waste will not be accepted and there will be no sorting of materials to remove contaminants. The 1% limit applies to all non-compostable materials and materials not permitted within the SWFP. Any loads that are greater than the 1% contamination limit will be rejected by returning the load to the hauler or disposed at the landfill.

Incoming feedstock shall contain no greater than 1.0 percent of physical contaminants by dry weight. Feedstock material shall have a moisture content not to exceed 50%. Feedstock material will be loaded into a dump truck by a front loader as soon as possible and delivered to the active composting area, where the material will then be placed into new compost piles by a front loader. Extremely odorous loads shall not be accepted. Feedstock material shall be inspected visually for particle size, moisture content, and contamination level prior to its acceptance. OCWR will not select or use any additives or amendments in the composting operation that are either highly odorous by themselves, are highly odorous when added to the compost piles, or are highly odorous over time during the active or curing phases of the composting operation.

Incoming feedstock are typically deployed into windrows within 72 hours. If significant odors occur from the feedstock pile, a new compost pile will immediately be built. If it is determined that a significant odor problem will still occur, the material will be mixed with other materials on-site, including curing compost piles if necessary and reprocessed. A last-case option would be to

landfill the material if no other options are available. Additionally, if upon acceptance at the composting operation, prior to unloading, any highly odorous loads will be taken to the landfill working face for disposal.

Should feedstock material arrive at the composting operation with noticeable odors, options for reducing odors would include but are not limited to the following: reject highly odorous loads and landfill the material; eliminate troublesome or contaminated feedstocks; mix materials upon receipt (i.e., to increase material porosity); blanketing odorous material with a six inch to one-foot layer of bulking agent, high carbon amendments or finished compost.

Should feedstock material in the receiving unloading and storage area begin to generate odors, options for reducing odors would include but are not limited to the following: expedite material processing; first in, first out processing; reduce the size of material stockpiles; blanketing odorous material with a six inch to one-foot layer of bulking agent, high carbon amendments or finished compost; reduce the volume of incoming materials; identify alternative facilities for incoming materials.

Should feedstock material begin to generate odors during mixing and material handling, options for reducing odors would include but not be limited to the following: create windrow piles that are sufficiently blended; create piles with good porosity; ensure that mixing areas/activities are located as far as possible from sensitive receptors; reduce mixing/materials handling activity during stagnant air conditions; reduce mixing/materials handling activity when wind is in the direction of sensitive receptors; mist water or odor neutralizer at dust generation points.

Should feedstock material begin to generate odors during the composting process, options for reducing odors would include but not be limited to the following: turn regularly to re-invigorate the composting process; maintain sufficient moisture in windrows; avoid over-watering windrows; make smaller windrows to increase passive aeration; increase porosity and bulk density; consider blanketing odorous materials with a six-inch to one-foot layer of bulking agent; make piles on a one-foot bed of overs to increase airflow; reduce turning/material handling activities when winds are blowing in the direction of nearby receptors; diligently manage and monitor the composting process.

Should feedstock material begin to generate odors during screening, options for reducing odors would include but not be limited to the following: reduce screening activities during stagnant air conditions; reduce screening activities when wind is in the direction of nearby receptors; use mist water or neutralizer at dust generation points.

Should feedstock material begin to generate odors from water ponding after a rain event, options for reducing odors would include but not be limited to the following: inspect piles after major rain events; grade the site to eliminate

puddles, depressions and wheel ruts where water collects; absorb ponded water with wood chips/other absorbent, fill potholes with soil/pad material.

Should feedstock material begin to generate odors as a result of un-composted material in aisles between the windrows, options for reducing odors would include but not be limited to the following: clean aisles of spilled material (particularly at the end of each day); mechanically sweep paved areas at the end of each shift; apply water and/or neutralizer to reduce dust during dry conditions.

Should feedstock material begin to generate odors during curing, options for reducing odors would include but not be limited to the following: increase processing time prior to moving to curing; decrease curing pile size; review moisture content of in-process compost; aerate curing piles by turning.

Should collected storm water in the lined pond begin to generate odors, options for reducing odors would include but not be limited to the following: review NPDES procedures to minimize storm water contact with organic materials; remove particles from water draining into the lined pond; filter stormwater through a filter berm or sock; clean out lined pond during the dry season (the pond will be cleared of debris monthly or more frequently if needed); reapply collected storm water to active compost piles.

5.2 PROCESS WATER DISTRIBUTION

The feedstock processing areas and compost piles are frequently monitored to ensure adequate moisture content levels and dust control are addressed. Other than rainfall, water is generally not added to the feedstock or active compost piles during the winter months. During the warmer summer and fall months, water is used to spray on an as-needed basis for the composting materials handling operations (loading, unloading, stockpiling, mixing, turning, and screening) for dust and moisture content management of the feedstock processing areas and compost piles.

5.3 COMPOST PAD and SITE DRAINAGE

The BCG compost pad is constructed of paved asphalt. The thickness of the pad is a minimum of one-foot; because the facility sits atop landfill stockpile 5-D the thickness of the pad typically exceeds the minimum thickness for a compost pad on native soil. The compost pad is partially located on top of historic waste fill. Settlement is expected to occur so remedial grading will be periodically conducted to eliminate any ponding on top of the pad which could contribute to odors. Stormwater runoff from the compost area is collected in a separate lined pond located adjacent to the windrows. The water collected in the pond will be recirculated into the compost piles for moisture control as needed to minimize the volume in the pond and reduce odors.

5.4 EQUIPMENT RELIABILITY

Processing equipment is maintained per the manufacturer's recommendations. Heavy equipment and water trucks are maintained per OC Waste & Recycling's comprehensive preventive maintenance program. OCWR has a fleet of heavy equipment and rental contracts and is able to immediately replace the dedicated pieces of heavy equipment at the composting facility as the need arises.

5.5 WEATHER EVENT IMPACTS

The Landfill's weather system is consulted to assure screening is not conducted during periods of high winds (measured at greater than 25 miles per hour). The facility uses both the weather monitoring system and an onsite windsock at the screening area to determine appropriate conditions for screening.

Heavy rainfall and/or wind are not uncommon weather events and could impede processing activities. There is adequate storage space available if operations have to temporarily cease due to adverse weather conditions.

5.6 METHOD AND DEGREE OF AERATION

Odors emanating from windrows typically indicate problems in the initial mixing, turning frequency, pile porosity and/or moisture content of the pile. The BCG strives to create windrows with appropriate carbon to nitrogen level (approximately 30:1 to start), adequate initial mixing and with adequate moisture (45 percent to 60 percent) within the windrows. Newly constructed compost windrows will initially be covered with at least 6 inches of finished compost within 24 hours of formation as required by SCAQMD Rule 1133.3. For the first 15 days after initial windrow formation, within six hours before turning, water will be applied as necessary to ensure the pile meets the wetness criteria described in Rule 1133.3. During this period, the temperature of each compost pile will be taken every day.

For Phases 1A and 1B processed feedstock is placed into windrows and moisture is managed at the proper conditions. The windrows are turned using a specialized windrow turner or loader. The turner or loader mixes the feedstock, moisturizes the feedstock as needed, reestablishes the porosity and redistributes moisture and heat. The windrows are turned at least five (5) times during the 15-day process to further reduce pathogens (PFRP) between the operating hours of 7AM to 5PM. Following the PFRP, windrows are turned once per week.

For Phase 1C CASP composting operations the feedstock materials will be formed into elongated piles for composting over aeration piping by front loaders with addition of moisture as needed by the on-site water truck. Based on typical aeration requirements for active composting operations with similar feedstock recipes and design criteria, the blower system will supply 0.83 to 2.5 standard cubic feet per minute (scfm) of air flow per cy of compost or approximately 1,500

scfm per pile at minimum for a specified duration. Active compost shall be maintained under aerobic conditions at a temperature of 55 degrees Celsius (131 degrees Fahrenheit) or higher for the PFRP period of 72 consecutive hours as specified in 14 CCR 17868.3(b)(3). Feedstock materials will remain in the active phase of composting until PFRP is met and the pile has undergone active aeration for a minimum of 21 to 28 days. Temperature is monitored through automated sensors (located as shown on Figure 9 of the RCSI) for a minimum of four readings per pile.

5.7 MOISTURE CONTENT OF MATERIALS

Feedstock with greater than 50% moisture content, to be determined by visual check, if free liquid is present then the feedstock will not be accepted. Water from the water tanks or the on-site storm water pond will be added to feedstock until an approximate moisture content of 45 to 55 percent is reached. This ensures optimal conditions for aerobic digestion to initiate in the windrows, minimizing the possibility of anaerobic conditions and attendant odor issues.

5.8 AIRBORNE EMISSION PRODUCTION

As described in Section 5.6, the windrows are to be turned regularly. Turning the windrows is important for maintaining even temperatures, redistributing moisture, and providing aeration. Proper aeration will allow for proper air flow and make oxygen available to the microorganisms. This will help control odors and emissions potentially associated with the windrows.

Fugitive dust is controlled through onsite visual monitoring and the use of a water truck that provides dust control as necessary. As discussed above, when needed due to lack of rainfall or during the hotter months, the compost piles will be sprayed with water to moisturize them and control dust.

5.9 PERSONNEL TRAINING

Project lead personnel have undergone and completed the 40-Hour United States Composting Council (USCC) Composting Operations training course which includes odor minimization management techniques. All BCG personnel will also be required to review and adhere to the OIMP. FRB site personnel working at the BCG have undergone the 40- Hour Hazardous Waste Operations and Emergency (Hazwoper) training certification program and are also required to attend the 8-hour refresher course annually. Records of employee training are maintained on-site. Orange County Fire Authority (OCFA) has issued the BCG general conditions which address operational, composting area, fire prevention, emergency response, safety protocols and requirements which will be adhered to in compliance with these requirements.

5.10 UTILITY SERVICE INTERRUPTIONS

Equipment utilized in the composting operation, including loaders, water truck, and screener, are powered by diesel fuel; potential power outages would not affect the equipment used at the BCG operation. Fuel for equipment is available through the existing diesel fuel storage tank at the FRB landfill.

5.11 SITE SPECIFIC CONCERNS

This facility has no site-specific concerns.

5.12 STORAGE PRACTICES

Feedstock receiving: Incoming materials will be stored no longer than 48 hours. If there is a high peak loading period there should be an effort to process the material and form it into windrows as quickly as possible where the aerobic breakdown can occur in a controlled state. This will require first in, first out approach to ensure each load is earmarked as to when it arrived and when it needs to be processed. The loads should also be kept as small as possible rather than adding more feedstock to a pile which would increase the potential for fires, odors, and vectors. This may require operations to reduce future feedstock shipments until operations can catch up to normal processing times. While the feedstock is waiting to be "officially" processed, some pre-monitoring can be done such as temperature monitoring to ensure the feedstock has not gone sour due to anaerobic degradation. If the feedstock creates significant issues, it can ultimately be buried at the landfill to remove the concern.

Composting: The average retention time for material in windrows will be 12 to 20 weeks. Phase 1A and 1B windrow dimensions will be roughly 20 feet wide by 12 feet high and Phase 1C CASP piles dimensions will be approximately a width of 22 feet, length of 88.5 feet, and a maximum height of 12 feet.

Finished compost storage: Most compost may be cured in place prior to being moved to the screening area. If a larger curing pile is created, prior to or post screening, it will be limited to 20 feet in height. A larger curing pile will only be used if the material is biologically ready to be cured (i.e., generating insufficient heat to generate nuisance odors).

OCWR's goal is to have just in time storage and have all finished material sold before it is stored; however, given the fluctuations in compost markets, compost may be stored up to 180 days, as necessary. But this is not expected to generate off-site odors.

TABLE 1

Possible Causes of Odors and Odor Minimization Management Techniques

Possible Causes of Odors	Odor Minimization Management Techniques
Odorous feedstock material upon arrival	1) Reject and turn back feedstock material loads to hauler/generator facility
	2) Initial moisture content of feedstock material loads shall not exceed 50% prior to its acceptance, to be determined by visual check, if free liquid is present then the feedstock load shall be rejected and turned back to hauler/generator facility
	3) Reject and turn back feedstock material loads with contamination level exceeding 10% and/or mixed with other organics
Excessive watering of compost pile in excess of 60% moisture content due to rain events causing ammonia-like odors	1) Once area is dry enough to work on, increase turning pile frequency to drain excess moisture and reduce moisture content between 40% - 60%
	2) Mix in additional feedstock material thoroughly while turning pile to absorb excessive moisture (open windrow composting only).
Standing water or ponding underneath or adjacent compost pile causing saturated feedstock material to rapidly decompose and emit odors	1) Maintain composting pad grade to flow away from pile to a low point established to hold and contain contact water for collection and proper disposal
	2) Maintain and fill in low spots within project area to prevent ponding or standing water
	3) Practice good housekeeping by containing loose feedstock material within the pile
Compost pile emitting Sulfur-like odors due to high temperatures exceeding 160 °F (anaerobic condition) and/or moisture content is below 40%	1) Check pile temperatures in excess of 160 °F and moisture content below 40%. If any monitoring or sampling point is in excess of 160 °F and/or moisture content is below 40%, turn and water entire pile thoroughly to obtain temperatures between 131 °F - 160 °F and moisture content between 40% – 60%

FIGURE 1

TETRA TECH BAS
21700 Copley Drive, Suite 200,
Diamond Bar, CA 91765
TEL 909.860.7777 FAX 909.860.8017

BEE CANYON GREENERY

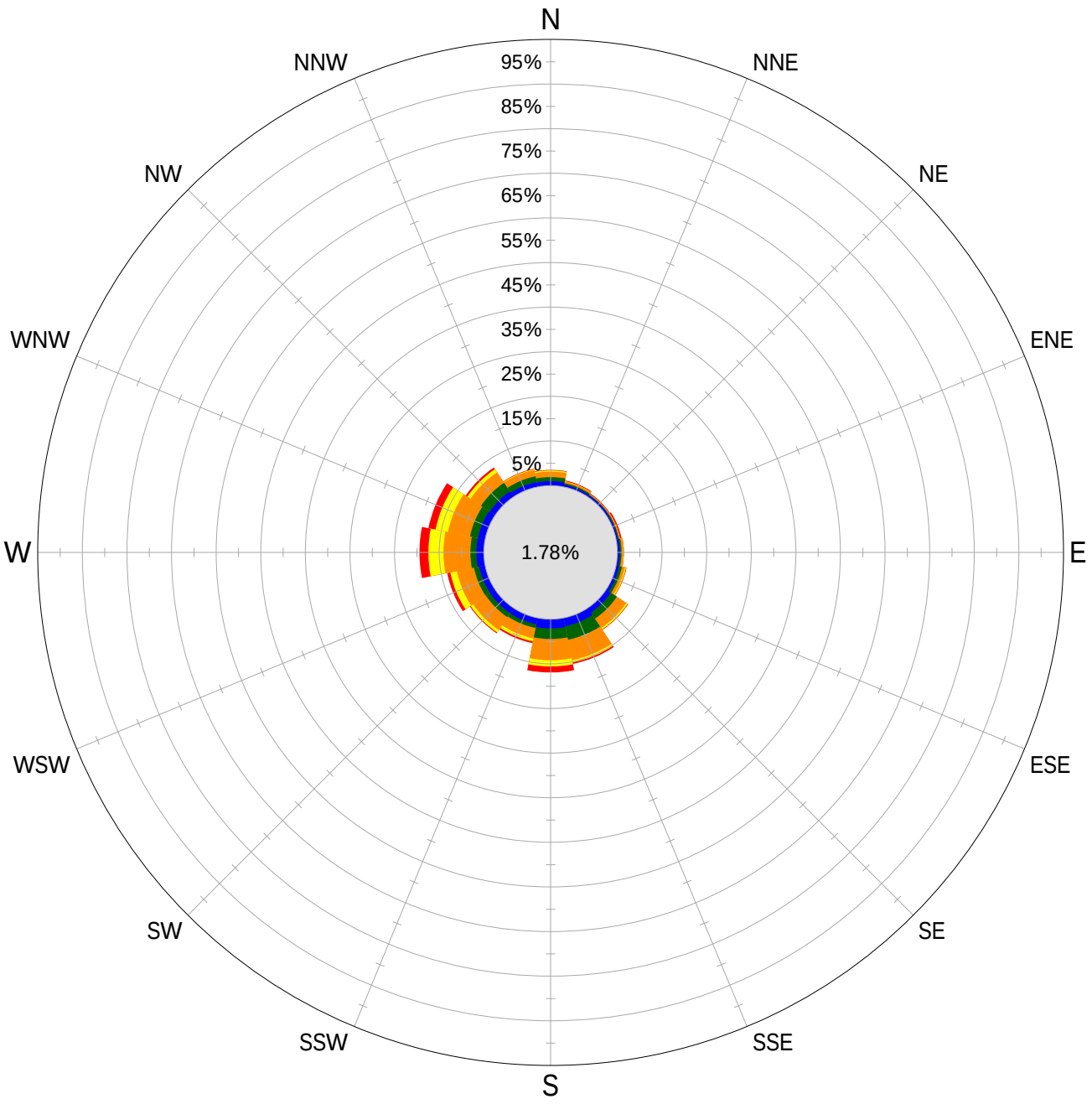
POTENTIAL OFF-SITE ODOR RECEPTORS MAP

FIGURE 1

P:\OCWR\FRB\BEE CANYON GREENERY\CAD\SHEETFILES\FIGURES\C-815 POTENTIAL OFF-SITE ODOR RECEPTORS MAP.DWG 8/5/2019 10:48 AM

EXHIBIT 1

Wind Rose [FRB-1]



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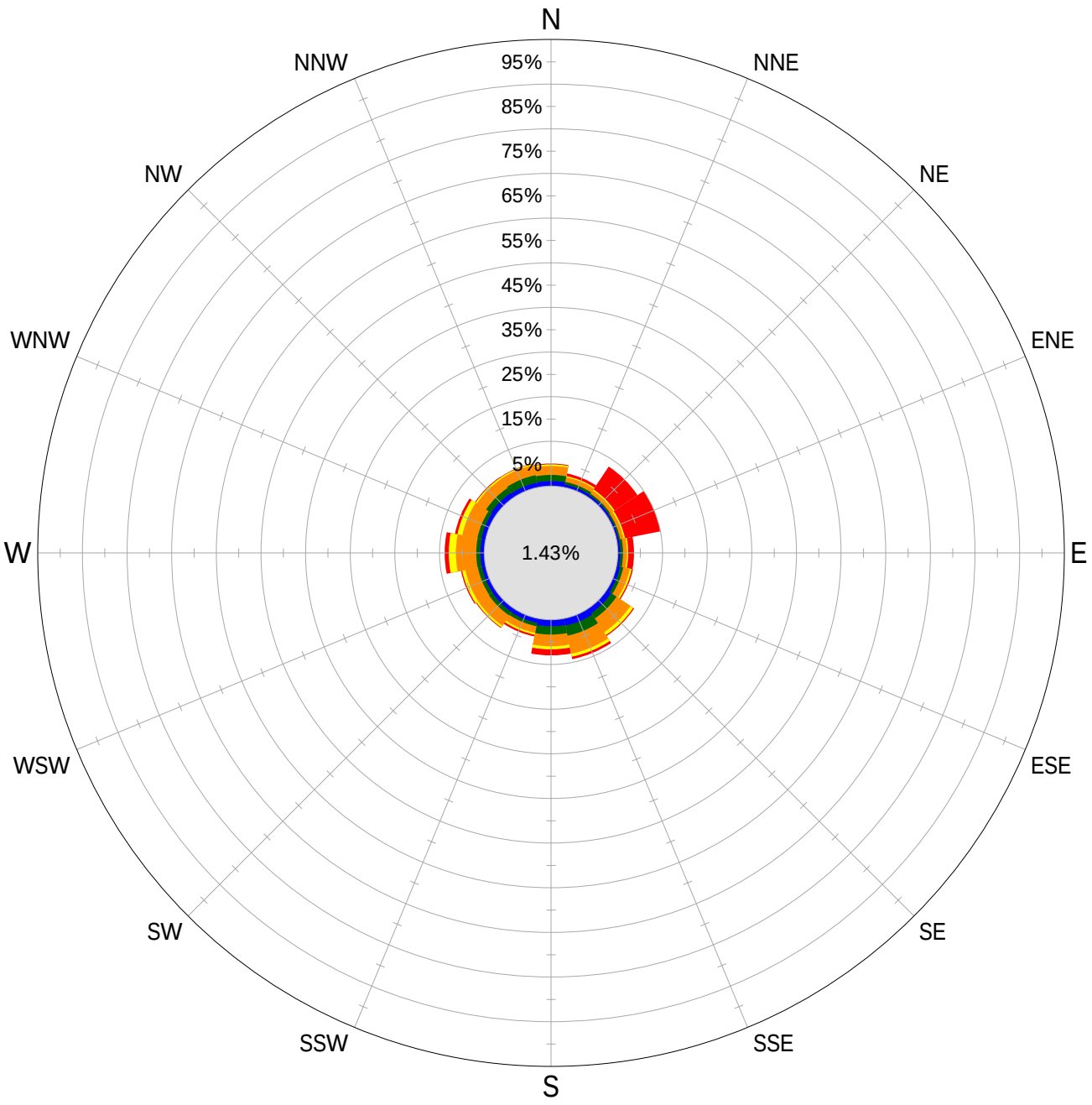
Wind Rose [FRB-1]



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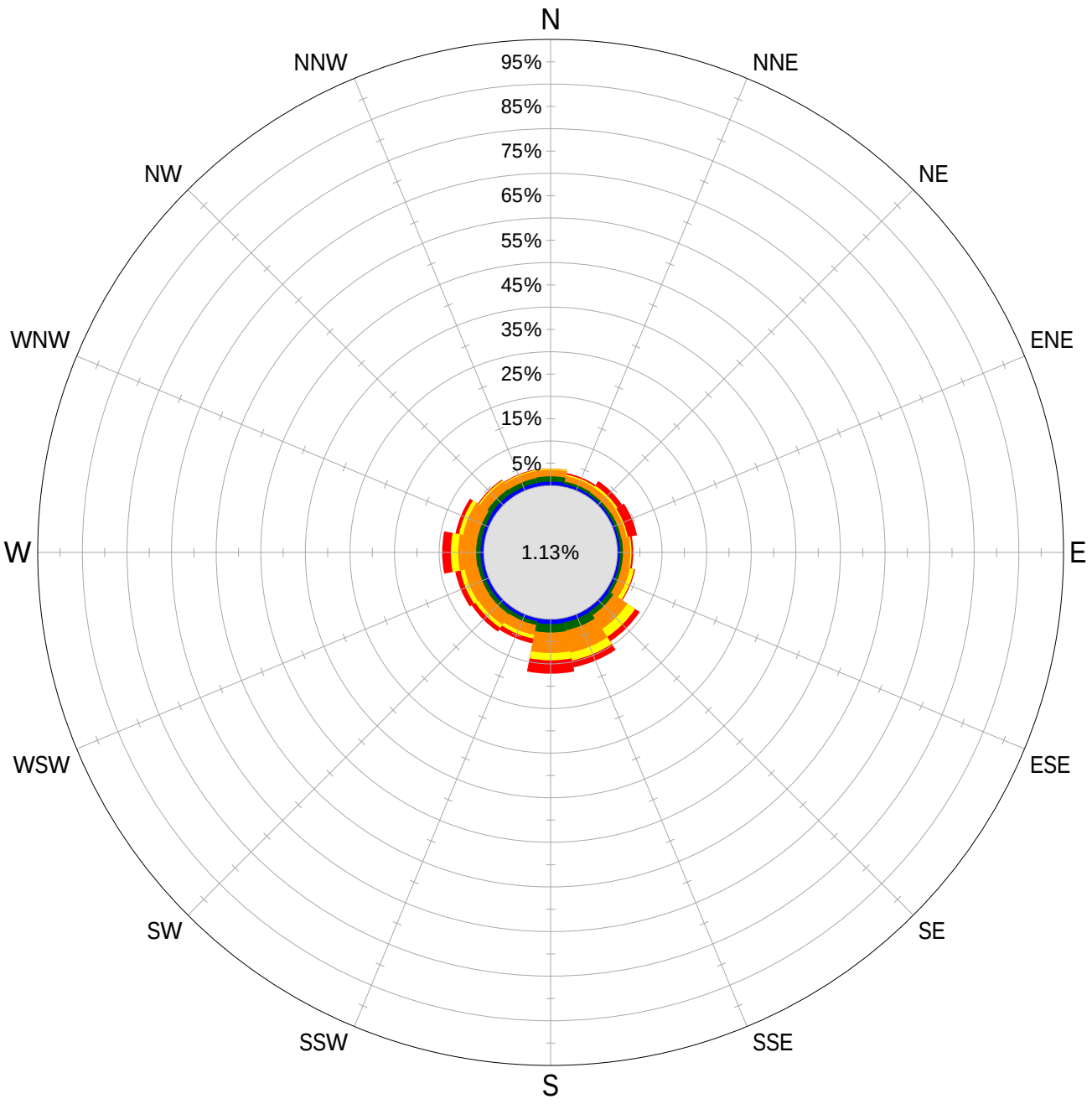
Wind Rose [FRB-1]



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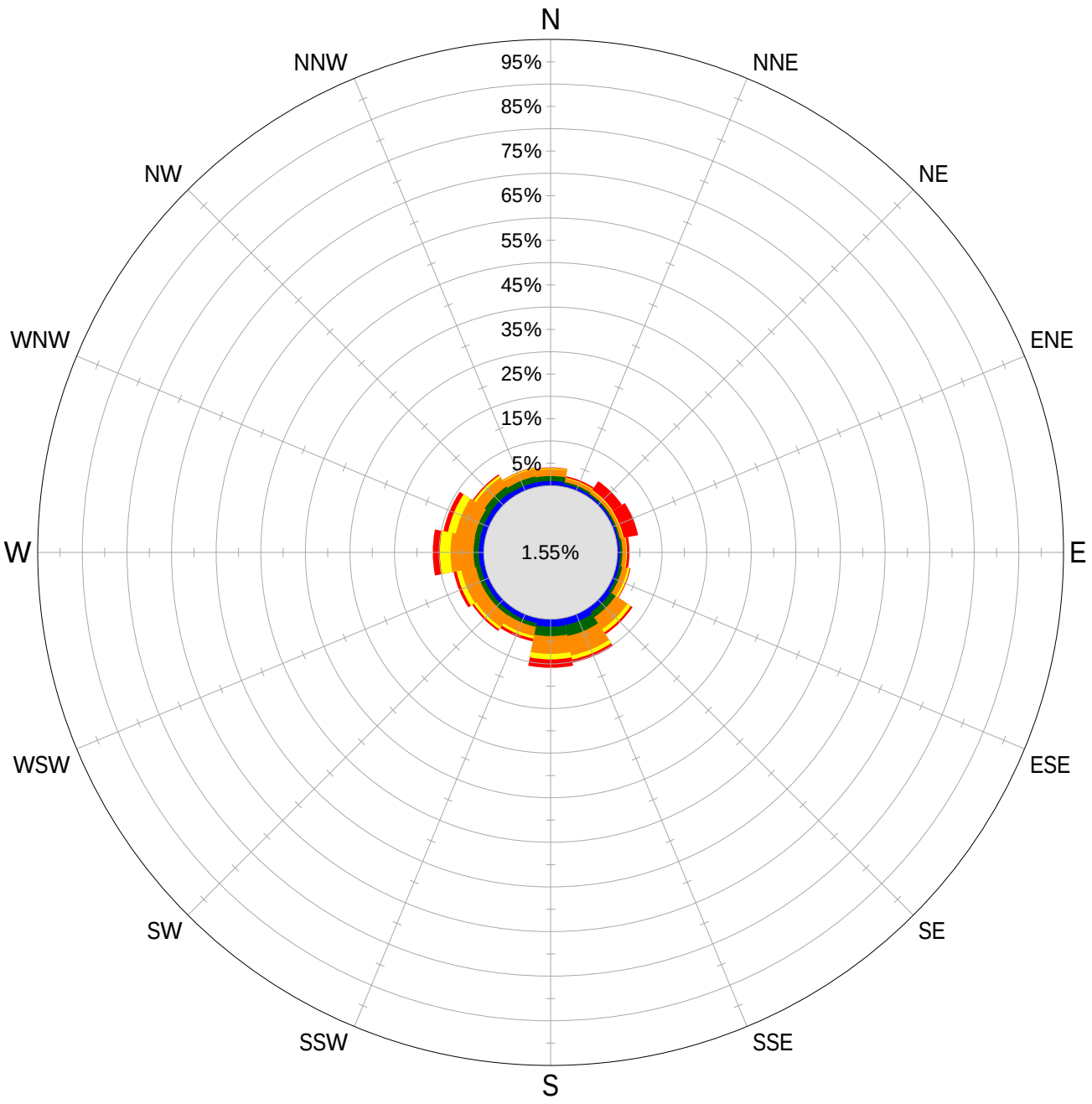
Wind Rose [FRB-1]



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Valid Records: 369539

EXHIBIT 2

BEE CANYON GREENERY COMPLAINT LOG

Updated: XXXXXX by XXXXXXX

ODOR INSPECTIONS LOG

No.	Date and Time Complaint Received	Date and Time of Incident	Complaint Type (i.e., Odors, Noise, View)	Complainant Name and Contact Information	OC W&R Complaint Recipient	Description of Complaint Landfill Operational Conditions Weather Conditions Working Area	PIO Follow-Up and Closure
1	X/X/XX 1:15 PM Response	X/X/XX 1:15PM	Odor	John Doe XXX Sand Canyon, Irvine 949-211-0701 Jdoe@gmail.com	HQ Notice	Description of complaint - see email/response Site Daily Report - 1.2.18 Phase C3 480'	
2							
3							
4							
5							
6							
7							
8							
9							