SUNSHINE CANYON LANDFILL

April 13, 2015

Mr. Martin Aiyetiwa, P.E., MPA
Senior Civil Engineer
Environmental Programs Division
County of Los Angeles Department of Public Works
900 S. Fremont Avenue, Alhambra, CA 91803

Subject: Final Proposal to Conduct Alternative Daily Cover Pilot Project, Geosynthetic Panel Product, Sunshine Canyon Landfill

Dear Mr. Aiyetiwa,

The Final Proposal to Conduct an Alternative Daily Cover Pilot Project using a geosynthetic panel product is hereby submitted to the Los Angeles County Department of Public Works (DPW) for your review. As we discussed at our April 8th meeting, this proposal was submitted to the Sunshine Canyon Landfill Local Enforcement Agency (LEA) in November 2014; approval from the LEA to conduct this demonstration project was received by letter dated November 26, 2014. A copy of the LEA letter is attached for your reference.

We look forward to working with the DPW on this important project. Please do not hesitate to contact me if you have any questions,

Sincerely,

Rob Sherman
General Manager
Sunshine Canyon Landfill

Attachments

14747 San Fernando Rd., Sylmar, CA 91342 (818) 833-6500 Office (818) 362-5484 Fax

SUNSHINE CANYON LANDFILL

SCL - LEA

LOCAL ENFORCEMENT AGENCY

14747 San Fernando Road
Sylmar, California 91343

November 26, 2014

Mr. Rob Sherman, General Manager
Republic Services
Sunshine Canyon Landfill
14747 San Fernando Road
Sylmar, CA 91342

Subject: Sunshine Canyon City/County Landfill (SWIS # 19-AA-2000)
LEA Approval of ADC Pilot Project

Dear Mr. Sherman,

On November 5, 2014, the Sunshine Canyon Landfill Local Enforcement Agency (LEA) received a proposal to conduct an alternative daily cover (ADC) pilot project at Sunshine Canyon Landfill (Landfill) using a geosynthetic panel product. The proposal was submitted in response to the recommendations of the Interagency Task Force to help control odor generation at the landfill by increasing the efficiency of the landfill gas collection system and leachate control system. The pilot project as proposed is scheduled to run for a period of one year which will allow the ADC to be evaluated under different season conditions.

The LEA has reviewed the proposed ADC pilot project and has determined that it meets the Alternative Daily Cover requirements pursuant to California Code of Regulations, Title 27 Section 20690, the Landfill's solid waste facility permit (SWFP) and CalRecycle's ADC Guidelines. The LEA has determined that the pilot project is one of the preapproved ADC materials specified in Title 27, and is consistent with the Interagency Task Force recommendations.

The LEA's approval is contingent on the following conditions:

- The geosynthetic cover area must be either covered with new waste or a full soil cover within 24 hours of product placement.
- The geosynthetic cover is non-reusable and once deployed shall not be removed from the working face.
- Any damage to the geosynthetic cover that occurs during deployment will be repaired prior to the end of that day's operations.
- At the end of the pilot project, a report shall be submitted to the LEA within 30 days documenting the observations, results and recommendations on the use of the geosynthetic cover at Sunshine Canyon Landfill.
- The LEA must be notified at least 7 days prior to the start of the pilot project.

Gerry Villalobos
SCL – LEA Program Manager
Office: (626) 430-5550
Email: gvillalobos@ph.lacounty.gov

Mailing Address
5050 Commerce Drive
***Baldwin Park*, CA 91706**

The LEA reserves the right to suspend, modify or revoke this approval if problems are observed with the use of the geosynthetic cover. This approval is only for areas of the pilot project under the jurisdiction of the LEA. The operator is required to obtain all of the other necessary approvals and clearances that may be required by the other regulatory agencies that have jurisdiction over the site.

If you have any questions regarding the LEA approval, I can be contacted at (626) 430-5550 or

Sincerely,

Gerry Villalobos
SCL LEA Program Manager

cc: David Thompson, SCL LEA
Sue Markie, CalRecycle
Patti Costa, Republic Services
Emiko Thompson, L.A. County Dept. of Public Works
Maria Masis, L.A. County Dept. of Regional Planning
Ly Lam, City of L.A. Planning Dept.
Mohsen Nazemi, SCAQMD
Wayde Hunter, SCL CAC

FINAL PROPOSAL TO CONDUCT ALTERNATIVE DAILY COVER PILOT PROJECT GEOSYNTHETIC PANEL PRODUCT

SUNSHINE CANYON LANDFILL

November 2014

FINAL PROPOSAL TO CONDUCT ALTERNATIVE DAILY COVER PILOT PROJECT

GEOSYNTHETIC PANEL PRODUCT

SUNSHINE CANYON LANDFILL

1.0 INTRODUCTION

Sunshine Canyon Landfill is a Class III solid waste municipal landfill located in Sylmar, California. The site is owned and operated by Republic Services, Inc. The landfill is permitted to receive up to 12,100 tons per day (tpd) and is currently accepting an average of 8,300 tpd. The site operates under Solid Waste Facility Permit (SWFP) 19-AA-2000 issued by CalRecycle. The hours of operation are Monday – Friday, 6 AM – 6 PM and Saturdays from 7 AM – 2 PM.

The purpose of this proposal is to present information to the Sunshine Canyon Landfill Local Enforcement Agency (LEA) to conduct a one year pilot project for the use of a geosynthetic panel product as alternative daily cover (ADC) in lieu of the 9 inches of soil currently be used at Sunshine Canyon Landfill. The demonstration project will be conducted to determine if the geosynthetic panel product material meets the performance requirements of Title 27 Section 20690 for controlling blowing litter, vectors, fires, odor and scavenging without presenting a threat to human health or the environment. It is proposed to use EPI's Enviro™ Cover material as ADC Monday through Friday. The geosynthetic panel product will be left in place at the start of the following day's operations; no removal of the material will be conducted. Soil will be used for daily cover at the close of operations on Saturdays. The soil cover will not be removed at the start of operations on Monday mornings.

1.1 Responsible Parties

The responsible parties and the chain of command for this project are as follows:

- Ron Krall, Los Angeles Area President, Republic Services, Inc.
- Rob Sherman, General Manager, Sunshine Canyon Landfill, Republic Services, Inc.
- Larry Bressman, Division Manager, Sunshine Canyon Landfill, Republic Services, Inc.
- Michael Stewart, Area Environmental Manager, Republic Services, Inc.
- Patti Costa, Environmental Manager, Sunshine Canyon Landfill, Republic Services, Inc.

2.0 BACKGROUND

Until October 2010, removable tarps were used for daily cover as alternative daily cover (ADC) as approved by permit conditions and Title 27 regulations. At the close of business on Saturdays, the working face was covered with a minimum of 18 inches of compacted soil cover. This cover was peeled back prior to the start of receipt of waste on Monday mornings.

By letter dated September 27, 2010, the Los Angeles County Department of Public Works (DPW) required the placement of nine (9) inches of compacted soil for cover at Sunshine Canyon Landfill (Attachment 1). In addition, DPW requires the soil is not removed or peeled back before the start of the next day's operations. Sunshine Canyon Landfill has been meeting these requirements since October 2010. These mandates were imposed by DPW to address the concern that odors from the working face were migrating off-site and creating conditions related to an increasing number of odor complaints from residents and community members in the Granada Hills area located to the south/southeast of the landfill.

It is believed the placement of 9 inches of daily cover soil for cover has been, and will continue to be, detrimental to certain aspects of the site's gas collection and control system (GCCS), the leachate control system, and the facility's comprehensive plan to address and mitigate the potential for off-site odors. These concerns were submitted to DPW in September 2012 and again in October 2012 as follows:

- Submittal of technical memoranda from four landfill consultants (Attachment 2);
- Submittal of a proposed revised operations plan for the removal of daily cover at the start of daily operations (Attachment 3);
- Submittal of a white paper authored by Blue Ridge Services regarding the assessment of alternative daily cover related to the origin and control of landfill odor (Blue Ridge Services) (Attachment 4).

2.1 Interagency Task Force

An Interagency Task Force was formed to research and evaluate best management practices to mitigate odors at Sunshine Canyon Landfill. This Task Force was comprised of personnel from the following agencies; the SCL LEA, SCAQMD, Los Angeles City Planning Department, Los Angeles County Department of Regional Planning, Los Angeles County Department of Public Works, as well as legal counsel for these agencies.

Recommendations from the Task Force were made by letter dated June 27, 2013 (Attachment 5). One of the recommended operational changes made by the Task Force includes a "pilot project for the Landfill Operator to demonstrate the effective use of a biodegradable or thermodegradable plastic approved as Alternative Daily Cover (ADC) or combinations of ADCs which meets the statutory performance standards that apply".

This proposal is intended to respond to this recommendation made by the Task Force.

It should be noted that EPI Environmental Products has released a statement regarding environmental claims related to the Enviro™ Cover system in the United States. This statement is included in Attachment 6. EPI Environmental Products Inc states they are unable to continue making environmental claims that the Enviro™ Cover System is "biodegradable" , "degradable" or "decomposable" in the United States as the material does not degrade quickly enough in a landfill environment to meet the requirements of a degradable material published by the Federal Trade Commission. The material is still a nonreusable geosynthetic alternative daily cover that meets the standards of ASTM D6523.

3.0 PROJECT DETAILS

This section describes the material and equipment specifications, material handling, and material placement procedures.

3.1 Material Specifications

The material proposed for this demonstration project is manufactured by Environmental Products, Inc. (EPI). The material is classified as a non-reusable geosynthetic alternative daily cover in ASTM D 6523-00 (2009). This material is approved as an ADC by CalRecycle (27 CCR, Chapter 3, Subchapter 4, Section 20690(b)(1). The material goes under the trade name of Enviro™ Cover . EPI manufactures several different film materials in different thicknesses for use as daily and intermediate cover; the choice of film material is based on the application.

For the demonstration project at Sunshine Canyon Landfill, the Extended Enviro™ Cover material is proposed to be used. This material has a 1.75 mil thickness and is designed to provide coverage for up to 4 weeks. The material specifications are provided in Attachment 7.

This material is considered applicable for use at the site due to the following:

- The material will only be used for daily cover material and will therefore be exposed to the elements for less than 12 hours;
- This material is designed with tear and puncture resistance, high tensile strength and elongation which has the ability to stretch over an uneven working face surface to provide full coverage;
- The material is impermeable and therefore encourages water runoff and controls infiltration of moisture;
- After the material is buried within the waste mass, it degrades and therefore will not impede the natural processes of waste degradation nor will it interfere with the proper collection of liquids or gas within the waste mass;

- The material will be left in place at the start of the next day's operations and covered with trash.

3.1.1 Documented Use of Extended Enviro Cover at Puente Hills Landfill, California

The County Sanitation Districts of Los Angeles County (Districts) used EPI's Extended Enviro™ Cover at their Puente Hills Landfill, located in the City of Industry, CA for over 10 years. Initially, the material was used as an ADC for a 2-week exposure time. In 2004, the Districts conducted a demonstration project to evaluate the use of the geosynthetic panel material as ADC for a 6-week exposure time at the Puente Hills Landfill. Based on the report submitted to the County of Los Angeles, Department of Health Services in March 2005, the use of the geosynthetic panel product was approved for an exposure time not to exceed 42 days for the months of October through March (Attachment 8). The 2-week exposure time remained in effect for the months of April through September. The Districts continued the use of the geosynthetic panel product from 2005 until the site closed in October 2013.

As required by LEA Advisory #48, Disposal Site Daily and Intermediate Cover Regulations, operator and regulatory contact information for Puente Hills Landfill is as follows:

Operator
County Sanitation Districts of Los Angeles County
Solid Waste Management Department
1955 Workman Mill Road
Whittier, CA 90601
(562) 908-4876

Regulatory
County Department of Health Services
Solid Waste Program
5050 Commerce Drive
Baldwin Park, CA 91706
(626) 430-5540
Permit #19-AA-0053

3.2 Equipment Specifications

The Extended Enviro™ Cover geosynthetic panel material will be deployed using the Enviro™ Cover System (ECS) Deployer Model 800 (Deployer). Information on the deployer is included in Attachment 9.

3.3 Material Placement

The placement of the geosynthetic panel product material will proceed as follows:

- The Deployer is loaded with a roll of Enviro™ Cover film and on-site ballast material(dirt);
- The Deployer is positioned on the outside edge of the cover area to deploy the first panel; - need to make sure that the outside edge is positioned a minimum of 5 feet from the outside of the waste material;
- During the application process, the Enviro™ Cover is unrolled from the Deployer while ballast material is simultaneously discharged at a controlled rate to securely anchor the Enviro™ Cover onto the working face;
- On successive adjacent runs to deploy the film material, an overlap (typically 10%) is put down, thus forming a compression-type seal creating a continuous closure and impermeable barrier between the waste and the environment.

On-site soil will be used for the ballast material. The ballast material is deployed by a hydraulic chain floor. The ballast volumes released can be adjusted and controlled by the Deployer operator. The typical volume of ballast is 0.75 m^3 of ballast for 150 m^2 of placed Enviro Cover. The Operations Supervisor will ensure an adequate stockpile of ballast material is available at the working face prior to placement of the Enviro Cover.

3.3.1 Material Placement – Windy Conditions

During high wind conditions, operational adjustments will be made to compensate for the weather conditions. Typically, this will include the following:

- Taking wind measurements to determine the direction the wind is coming from;
- Deploying the geosynthetic panels parallel to the wind direction to minimize potential uplifting of the material while it is being deployed;
- Placement of additional ballast material;
- Providing for additional overlap of the panels.

If the material cannot be put down to provide the necessary coverage during high wind conditions, or if the deployment of the panels proves to be problematic during these conditions, the working face area will be covered with 9" of soil cover.

3.4 Material Supplier

All materials will be purchased from EPI Environmental Products, Inc. All materials will meet the manufacturer specifications (Attachment 7).

EPI Environmental Products, Inc.
102 Grover Street
Lynden, WA 98264
(604) 738-6281
Contact: Mr. Randy Kozak, Division Manager

3.4 Material Handling and Storage

Since Enviro™ Cover is a degradable product with a shelf-life and storage UV restrictions, rolls of the material are enclosed in UV protective packaging equipped with lifting slings for easy and safe handling. There are no additional material handling or storage considerations given the material will be used for daily ADC and long-term storage for the material will not be necessary. The rolls of Enviro™ Cover will be stored securely near the working face so access to the material is convenient to the site operations personnel. Sufficient material will be ordered and stockpiled to ensure a sufficient quantity is on-site for daily cover operations. Should there be insufficient material on-site to completely cover the working face, cover operations will be conducted with compacted soil.

4.0 PERFORMANCE REQUIREMENTS (27 CCR 20690(a))

Based on the documented information from the performance of Enviro™ Cover at Puente Hills Landfill, it is expected this material will meet the performance requirements of 27 CCR 20690(a). Information submitted to the County of Los Angeles, Department of Health Services (Attachment 8), documented the material tested met the performance standards set forth in Title 27 CCR Section 20695 and fulfills the requirements for ADC set forth in Section 20690.

For the demonstration project at Sunshine Canyon Landfill, performance criteria will be evaluated for the duration of the demonstration project. Evaluation of performance criteria will be accomplished as follows:

Vectors — The landfill working face area is inspected on a daily basis by site personnel and also by on-site LEA personnel. Any vector infestation will be controlled immediately as required by SWFP 19-AA-2000. Monitoring to meet the required performance criteria is discussed in Section 5.1. It is expected the geosynthetic panel product will control vectors equal to the soil cover currently in use. The LEA will be notified immediately if a situation arises where it is deemed necessary to conduct additional monitoring for vectors.

Fires — The landfill working face area is inspected on a daily basis by site personnel and also by on-site LEA personnel. The landfill has an operational procedure for handling hot loads that create a potential fire situation at the working face. The geosynthetic panel product is not expected to increase the likelihood of fires as the use of soil for intermediate cover will continue to provide barriers against the spread of subsurface fires, should they occur. In addition, soil will be stockpiled near the active working face to be used to fight a fire, if needed. Based on information provided by EPI, the geosynthetic panel product are not classified as flammable (Attachment 10).

Litter — Control of windblown litter from the working face will continue to be conducted during times when it is necessary to do so. The use of geosynthetic panel product is not expected to increase the potential for windblown litter since this typically occurs during active disposal activities. The geosynthetic panel product should prevent litter from escaping from the working face after it is properly deployed since the working face area will be completely covered with the film and held in place with ballast material.

Scavenging — The landfill working face area is inspected on a daily basis by site personnel and also by on-site LEA personnel. Any scavenging activity will be controlled immediately as required by SWFP 19-AR-2000. It is expected the geosynthetic panel product will control scavenging equal to the soil cover currently in use since the working face area will be completely covered with the film and held in place with ballast material.

Odor — As discussed in Section 2.0, the current requirement to place 9 inches of compacted soil for daily cover was mandated by DPW in response to the increase in odor complaints which began in November 2009. Since that time, significant improvements to the site's gas collection and control system have been implemented, and odor control measures have been put into place as part of the site's overall odor management program to control the off-site migration of odors from the working face.

Literature documenting the ability of Enviro™ Cover to control odors suggests this material will be as effective as the soil cover currently in use. A technical paper published by EPI regarding the use of this material as it relates to odor control is included in Attachment 11.

5.0 ENVIRONMENTAL MONITORING

5.1 Odor Monitoring

The effectiveness of the Enviro™ Cover to control odors to meet the performance requirements of 27 CCR 20690(a) will be addressed by the documentation of odors during the on-going odor patrols that are currently being conducted in the nearby communities. The off-site odor monitoring is part of the landfills' overall odor management program; no changes to the off-site odor monitoring will be made for the duration of the demonstration project

5.2 Additional Monitoring

Sunshine Canyon Landfill personnel will examine the cover material at the end of each working day after the working face has been completely covered with the Enviro™ Cover geosynthetic panel product. Each morning (Tuesday through Saturday), the area covered by geosynthetic panel product will be inspected prior to the start of the receipt of trash to ensure the material remained in place throughout the night. Any tears, punctures or unusual observations related to the geosynthetic panel product will be documented and reported to the LEA. A log will be developed which site operations personnel will use to document observations of the cover material at the start and end of each working day the Enviro™ Cover geosynthetic panel product is used. The logs will be maintained at the site administration office. Pictures will be taken periodically and kept with the log sheets. If there are any issues observed, pictures will be taken to document the issue and also to provide verification that the issue has been resolved.

6.0 REPORTING

At the conclusion of the pilot project, a report will be prepared documenting the observations, results and recommendations for continued use of the geosynthetic panel product as ADC at Sunshine Canyon Landfill.

7.0 COMMITMENT TO TERMINATE THE PILOT PROJECT

The pilot project will be terminated either by the Republic Services' Sunshine Canyon Landfill Division Manager or at the direction of the LEA if the geosynthetic panel material does not

perform to meet the stated performance requirements, or if problems arise with the use of this ADC material that cannot be corrected. If the decision is made to terminate the pilot project, waste material will be covered with 9" of soil cover.

ATTACHMENTS

Attachment 1 September 27, 2010 Letter from County of Los Angeles, Department of Public Works

Attachment 2 September 24, 2014, Letter to LA County Department of Public Works, Daily Cover vs. Gas System Efficiency

Attachment 3 Request to LA County Department of Public Works, Revised Operations Plan, October 2012

Attachment 4 Assessment of Alternative Daily Cover Related to Origin and Control of Landfill Odor, Blue Ridge Services, December 18, 2012

Attachment 5 Interagency Task Force Sunshine Canyon Landfill Odor Mitigation Program Recommendations, June 27, 2013

Attachment 6 August 5, 2014 Letter from EPI Environmental Products Regarding Environmental Claims Relating to Enviro™ Cover System in the United States

Attachment 7 EPI Enviro™ Cover Technical Specifications

Attachment8 Alternative Daily Cover Demonstration Project: Geosynthetic panel product, County Sanitation Districts of Los Angeles County, March 7, 2005

Attachment 9 Enviro™ Cover System (ECS) Deployer Model 800

Attachment 10 April 6, 2014 Memo Regarding Enviro™ Cover Flammability/Combustibility, Cadwallader Technical Services

Attachment 11 Technical Memorandum - Enviro™ Cover System, Best Practice for Landfill Gas and Odor Control, June 3, 2014

ATTACHMENT 1

COUNTY OF LOS ANGELES

DEPARTMENT OF PUBLIC WORKS

"To Enrich Lives Through Effective and Caring Service"

900 SOUTH FREMONT AVENUE
ALHAMBRA, CALIFORNIA 91803-1331
Telephone: (626) 458-5100
http://dpw.lacounty.gov

GAIL FARBER, Director

ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1460
ALHAMBRA, CALIFORNIA 91802-1460

September 27, 2010

IN REPLY PLEASE REFER TO FILE EP-5

Mr. Kurt Bratton
Vice President
Republic Services, Inc.
Sunshine Canyon Landfill
14747 San Fernando Road
Sylmar, CA 91342-1021

Dear Mr. Bratton:

ODOR NUISANCE AT SUNSHINE CANYON LANDFILL
CONDITIONAL USE PERMIT NO. 00-194(5)

Based on information received by this Department and provisions established in Condition No. 45.N of the Sunshine Canyon Landfill (Landfill) Conditional Use Permit (CUP), we are hereby requiring Republic Services, Inc./Browning-Ferris Industries (Republic) to implement additional corrective measures to reduce the odor nuisance resulting from activities related to the operations of the Landfill.

Background

Since late 2009, residents living in the vicinity of the Landfill and staff/students from the nearby Van Gogh Elementary School have filed numerous complaints alleging odors from activities and operations occurring at the Landfill. According to Republic's Quarterly Dust and Odor Complaint Reports and Monthly Reports to the Sunshine Canyon Landfill - Local Enforcement Agency (SCL-LEA), as well as the Order for Abatement issued by the South Coast Air Quality Management District (AQMD) Hearing Board on March 24, 2010, more than 300 complaints were filed in 2009, of which more than half occurred during the month of November. The complaints continued into the first two months of 2010 totaling more than 160 complaints. These complaints resulted in numerous Notices of Violations issued by the AQMD to Republic for creating a Public Nuisance, the highest being five (5) Notices issued in November 2009.

As required by the Order for Abatement and in an attempt to relieve the impacts on the nearby residents, Republic implemented various corrective actions. Conditions pursuant to the Order included: restricting the size of the working face; reducing the amount of trash delivered by transfer stations on Monday mornings; and utilizing misting and odor control systems at the working face.

Other mitigation measures being undertaken include developing study proposals regarding daily cover materials and landfill gas emissions controls, and a plan to augment the vegetation in the southern areas of the Landfill.

Findings and Determination

While we recognize Republic's efforts to comply with AQMD's Order for Abatement, we have determined that additional corrective measures are necessary at this time to further reduce odors related to operations at the working face which is identified in the Order for Abatement as a potential odor contributor. Our determination is based on:

- the frequency and duration of the odor complaints from the surrounding community
- public testimony received by AQMD's Hearing Board during the Order for Abatement proceedings
- consultation with the SCL-LEA, AQMD, and the County Department of Regional Planning
- information contained in Republic's draft Working Face and DustBoss Study Proposal, dated July 28, 2010
- Public Works' physical inspections of the site and surrounding areas

Republic's current practice of removing nearly six inches of soil cover on Monday mornings and leaving approximately three inches of cover remaining on the working face is inconsistent with established sound engineering practice, and a key contributing factor to the odor conditions. This practice compromises the integrity of the soil cover thereby significantly contributing to an odor nuisance and posing a risk to public health and safety.

Additionally, Republic's practice of using tarps as daily cover, from Monday through Friday, on the advancing side of the working face deviates from the standard application of compacted soil as daily cover, which has been proven to be effective in controlling odor and other nuisances. Furthermore, using soil as an odor reduction measure is consistent with the City of Los Angeles' Mitigation Reporting and Monitoring Program, dated February 25, 1999, which provides for the application of additional dirt as daily cover material to mitigate odor impacts (see enclosed Section 4.2.13, No. 33, page 7). The mitigation measure is also consistent with the certified Subsequent Environmental Impact Report for the project.

Corrective Measures

Therefore, pursuant to CUP Condition No. 45.N, Republic is required to implement the following corrective measures within 30 days of the date of this letter:

1. Terminate the use of any alternative materials as daily cover other than compacted soil.

2. Cover disposed solid waste with a minimum of nine inches of compacted soil at the end of every operating day, Monday through Saturday, and at more frequent intervals as necessary, to control vectors, fires, odors, blowing litter, and scavenging. Tarp may only be used to enhance the control of vectors or other nuisance, but may not replace the use of soil.

3. Discontinue the practice of removing compacted soil cover at the beginning of an operating day. The compacted soil cover applied at the end of the previous operating day must be kept in-place.

4. Submit to Public Works for review and approval an Odor Mitigation Plan that incorporates the following elements at a minimum:

    a. Identify and provide status on the measures currently being implemented as required by the AQMD's Order for Abatement

    b. A program for managing odoriferous loads currently received at the Landfill, which would include the following at a minimum:

        - Provide a trained technician to identify odiferous loads.
        - Immediately bury odiferous waste loads at the working face within one hour of its arrival.
        - Develop a program to minimize odors from transfer trucks and direct haul loads.

    c. An odor patrol program, which would include the following at a minimum:

        - Provide a trained technician to conduct odor patrols in the surrounding neighborhoods at a frequency of one patrol per hour from 6 a.m. to 10 a.m., Monday through Saturday, and during adverse wind conditions[1].

1 As defined in AQMD's Order for Abatement dated March 24, 2010, Adverse Wind Conditions mean either: 1) wind speed measured at the existing monitor at the southern berm from all directions as less than 2 mph; or, 2) wind speed measured at the same monitor coming from the north/northeast direction from between 320 degrees and 15 degrees at less than 15 mph. Wind speed is based on measured winds from three continuous one-hour averaging periods commencing at 3 a.m. Any hour in which there is measurable precipitation will not be classified as an adverse wind condition, in that precipitation generally suppresses odors at landfills.

- If odor is detected, identify its potential and/or actual source, including those that may not be related to the Landfill's operation, such as an odorous trash dumpster or transfer trucks.
- If odor is determined to be related to the Landfill's operation, take immediate action to reduce the odor. Document the streets patrolled on a map, time of the patrol, potential source of odor, and immediate actions taken by the Landfill.

d. A landfill gas mitigation plan in preparation for the next rainy season since landfill gas emissions from either the landfill surface or landfill gas control equipment is cited as a potential contributor in the AQMD's Order for Abatement. The plan should include the following at a minimum:

- Description of the site's current Gas Monitoring and Control Plan, including a map showing locations of gas monitoring probes, gas extraction wells, horizontal and vertical gas collection lines, etc.
- Compliance history of the site's landfill gas migration control program from January 1, 2009, to the present quarter as well as any corrective actions.
- Discuss the impacts of the most recent heavy rains on the landfill gas collection system, including identifying locations of damage due to soil erosion, as well as any corrective actions or mitigation measures.
- A work plan that includes preventive measures, such as identifying and filling any surface cracks and installing additional extraction wells, as well as contingency measures.
- An implementation schedule for the above work plan.

5. Include in the Quarterly Dust and Odor Reports, which are required by CUP Condition No. 45.N, the status and effectiveness of mitigation measures 1 through 3 above, and the Odor Mitigation Plan.

6. The corrective measures described above shall not be modified or terminated without prior written approval of the Director of Public Works.

Failure by Republic to implement these corrective measures shall constitute a violation of the CUP and be subject to the penalty provision described in Condition No. 11 of the CUP.

If you have any questions, please contact Mr. Martins Aiyetiwa of this office at (626) 458-3553, Monday through Thursday, 7 a.m. to 5:30 p.m.

Very truly yours,

GAIL FARBER
Director of Public Works

PAT PROANO
Assistant Deputy Director
Environmental Programs Division

LL:dy
P:\sec\Sunshine Canyon Landfill CUP

Enc.

cc: South Coast Air Quality Management District (Edwin Pupka, David Jones)
Department of Regional Planning (Richard Bruckner, Maria Masis, Bruce Durbin)
Department of Public Health (Cindy Chen, Gerry Villalobos)
Sunshine Canyon Landfill Technical Advisory Committee (Richard Bruckner, Michael LoGrande)
City of Los Angeles Department of City Planning (Michael LoGrande, Ly Lam)
Sunshine Canyon Landfill - Local Enforcement Agency (Program Manager)
Members of the Los Angeles County Solid Waste Management Committee/ Integrated Waste Management Task Force
Sunshine Canyon Landfill - Community Advisory Committee (Becky Bendikson, Wayde Hunter)

ATTACHMENT 2

REPUBLIC SERVICES

September 24, 2012

Mr. Pat Proano, P.E., M.P.A.
Assistant Deputy Director
County of Los Angeles, Department of Public Works
Environmental Programs Division
900 South Fremont Avenue
Annex, 3rd Floor
Alhambra, CA 91803-1331

RE: SUNSHINE CANYON LANDFILL DAILY COVER VS. GAS SYSTEM EFFICIENCY

Dear Pat:

During the last twelve months we have completed several important landfill gas system upgrades at Sunshine Canyon Landfill (SCL) as part of our ongoing efforts to improve landfill gas collection and removal. These improvements consist of:

- Two new flares - a permanent 5,000 SCFM flare and a temporary 3,000 SCFM flare to burn and destroy landfill gas;
- 14,000 linear feet of upgraded perimeter landfill gas collection headers;
- 17,800 linear feet of horizontal landfill gas collectors in active cell CC-2;
- 3,000 linear feet of a top of liner edge landfill gas collectors;
- 11,300 linear feet of lateral pipe landfill gas collection upgrades in the well field;
- 173 new vertical landfill gas extraction wells;
- Upgrade existing flare blowers in the gas collection system from 40 HP to 200 HP units;

As a result of this program we have seen significant increases in landfill gas collection and removal volumes.

In August 2012, SCL experienced an odor event that resulted in numerous complaint calls to the South Coast Air Quality Management District's (District) hotline. We traced the source of the odors to slopes in the new active waste cell, CC-2, and subsequently our landfill gas system operator discovered the presence of liquids in vertical gas extraction wells in this area. These wells were installed in June of 2012. Our gas system operator verified that liquid in these new gas extraction wells had blocked the pipe slots which are used to extract landfill gas thereby greatly reducing these well's capability to extract and control landfill gas in this area of the site.

12949 Telegraph Road, Santa Fe Springs, CA 90670
Telephone (562) 663-3400 Facsimile (562) 906-0251

As mentioned above, landfill cell CC-2 was a recently constructed cell. Disposal operations did not commence in this cell until slightly over a year ago, in June of 2011. Because SCL does not receive significant rainfall compared to other landfills, the presence of liquid in the new gas extraction wells was entirely unexpected.

A review and analysis of this situation has been conducted by four independent landfill engineering and landfill gas system consultants including our Independent Environmental Monitor (IEM), Brown and Caldwell. As you are aware, the IEM was required and approved by the District. Based on these reviews, we and these independent firms have all concluded that the cause of the liquid blockage in the new gas wells is SCL's compliance with the County Department of Public Works' (County DPW) order that (1) SCL place nine inches of daily cover soil at the landfill disposal area ("the "working face") at the end of each day of disposal operations, and, (2) the nine inches of daily cover soil is not removed at the start of the next day's operations. Attached to this letter are the reports of these evaluations from each of these independent consultants documenting their findings.

In short, the County DPW requirement that we leave the nine inches of cover soil at the working face each morning and then bury new garbage each day on top of this soil is contributing to odor problems at SCL.

Why is this? It is because these layers of soil in the buried waste are acting as impermeable barriers that interfere with the normal process that occurs in landfills, in which liquids percolate downwards through the waste towards the bottom of the landfill. In a typical landfill that we operate, these liquids are collected by the leachate collection system at the bottom of the landfill and are properly removed and disposed. Instead, these layers of soil left in place per the County DPW order are causing landfill leachate to collect or pool on top of these impermeable soil layers in the waste mass. These trapped liquids can only then flow downward through the sole pathway left to them - the perforated vertical gas extraction pipes that pass vertically through these horizontal soil lenses.

Therefore, the collection of liquids in the landfill gas wells is being caused by the County DPW's order that the nine inches of soil cover not be removed the next morning prior to commencement of waste operations. This interferes with the ability of SCL to control odors that could potentially travel off-site to the nearby neighborhoods.

We have previously written to County DPW regarding our concerns over not removing the soil cover each morning when we start disposal operations at the working face. We understand the requirement was imposed by County DPW in

good faith as an abatement measure to control potential odors from the working face. However, based on our experience to date, which is confirmed by the unanimous opinion of four independent consultants, we must renew our request that we remove this daily soil cover each morning prior to the placement of new waste. We will continue to place the nine inches of daily cover soil on the working face at the end of each day of disposal operations to help control odors, as currently required.

Again, please note that we are only asking for permission to remove the soil each morning before we start burying new waste in the working face. We believe this "peel-back" of soil each morning will allow waste-on-waste contact and the proper movement of liquid and landfill gas through the landfill. Without this relief, the efficiency of the landfill gas extraction system and leachate collection systems will continue to be compromised.

Given our sense of urgency to eliminate odor sources at SCL and the need for a quick response to address this problem, we respectfully request that you let us know by October 9, 2012 if you have any objection to our removing the soil cover in the morning.

I am available to discuss this matter at your convenience. You may reach me at (818) 256-9946 or via email at abertrand@republicservices.com.

Sincerely,
Republic Services

Anthony Bertrand, P.E.
Area Environmental Manager – Los Angeles

Attachments

cc: David Cieply, Republic Services
Kurt Bratton, Republic Services

Brown AND Caldwell

801 South Figueroa Street
Los Angeles, CA 90017
Tel: 213-271-2300
Fax: 213-271-2320

Technical Memorandum

Prepared for: Republic Services, Inc., Sunshine Canyon Landfill

Project Title: Independent Odor Monitoring, Sunshine Canyon Landfill

Project No: 142883.007.001

Technical Memorandum

Subject: August 26 – 28, 2012 Odor Incident Study

Date: September 24, 2012

To: Anthony Bertrand, Area Environmental Manager

From: Michael Yacyshyn, Chief Engineer, Brown and Caldwell

Copy to: Patti Costa, Republic Services, Inc.
Lisa Skutecki, Brown and Caldwell

Prepared by: _____

B. Michael Yacyshyn, P.E.

Reviewed by: _____

Steve Batiste

Limitations:

This document was prepared solely for Republic Services, Inc. in accordance with professional standards at the time the services were performed and in accordance with the contract between Republic Services, Inc. and Brown and Caldwell dated January 18, 2011. This document is governed by the specific scope of work authorized by Republic Services, Inc.; it is not intended to be relied upon by any other party except for regulatory authorities contemplated by the scope of work. We have relied on information or instructions provided by Republic Services, Inc. and other parties and, unless otherwise expressly indicated, have made no independent investigation as to the validity, completeness or accuracy of such information.

1. Introduction

Brown and Caldwell (BC) is under contract to Republic Services, Inc. (Republic) to provide independent environmental monitoring (IEM) for landfill-related odors at Sunshine Canyon Landfill (SCL). One of our responsibilities is to investigate odor complaints from the neighboring community. This technical memorandum (TM) describes Brown and Caldwell's evaluation of conditions at the SCL that appear to have contributed to off-site odors on August 26 through August 28, 2012.

2. Incident Study

2.1 Odor Complaints

Odor complaints from the neighboring community were received on August 26 through August 28, 2012:

- On the evening of Sunday, August 26 and early morning of Monday, August 27, between approximately 21:13 and 00:31 hours, the South Coast Air Quality Management District (District) Inspector verified five complaints from neighborhoods in the vicinity of the SCL. The odors were characterized as landfill gas (LFG).
- On Monday, August 27, the District Inspector verified three odor complaints between 21:35 and 21:53 hours, which were characterized as a LFG odor.
- On Tuesday, August 28, beginning at 06:10 hours to 08:13, the District Inspector verified 25 complaints characterized as trash. Seventeen of these complaints originated from the Van Gogh Elementary School. An additional nine complaints were verified by the District Inspector from 08:50 to 09:16 hours, which were characterized as a LFG odor. Note that the SCL odor patrol noted very faint to faint LFG odors during this time period.
- On Tuesday, August 28 extending to early Wednesday, August 29, the District Inspector verified nine odor complaints between 20:50 and 00:51 hours, which were characterized as a LFG odor.

2.2 SCL Conditions

There appear to be several contributing factors at SCL that may have contributed to the odors.

- Eight of 14 vertical LFG extraction wells in the CC-2 area were not functioning as designed due to high liquid levels in the wells covering perforations. This condition was discovered in mid August 2012 as SCL staff was evaluating their LFG extraction wells. The CC-2 area is where active disposal operations were occurring at this time. These wells were installed in June 2012. Due to an evaluation of the non-functional wells, SCL chose to add 10 new wells in the same general vicinity in early September 2012. The September 2012 wells will augment the other wells in this area.
- Flare shutdowns for flares 3 and 8 occurred during the time the odor complaints were received. Flare 3 shut down on Monday, August 27, between 12:50 and 14:55 hours for approximately 2 hours. Flare 8 shut down on Monday, August 27, at approximately 17:20 hours and was restarted at 08:00 hours on Tuesday, August 28.
- Winds from the north ranging from about 5 miles per hour (mph) to over 10 mph occurred at various times during the August 26 to August 28 period. Winds from the north are considered adverse as defined by the Third Amended Stipulated Order for Abatement (S/O), Case No. 3448-13, signed on December 3, 2011.

3. Discussion

The results of our study indicate there are several conditions that may have contributed to the off-site odors for the August 26 to August 28, 2012 period. Adverse wind conditions were clearly a factor. However, the winds cannot be controlled. The flare shutdowns probably had some impact on the observed off-site odors, but it is difficult to quantify that impact as when a flare goes down, the remaining operational flares compensate to some extent. The flares are part of a comprehensive gas collection and control system (GCCS) at SCL that operate in concert to control LFG. Republic is in the midst of a significant GCCS improvement program. The improvement program includes a new high-capacity flare (Flare 9), new large diameter header pipes, new vertical and horizontal LFG collection wells and new high-capacity blowers. Many of these improvements have been completed and adjustments and fine tuning of the GCCS continue.

Until recently, the CC-2 area was the most recently lined cell in SCL (construction of the CC-3 area was recently completed). Waste disposal operations began in the CC-2 area in July 2011. The non-functional LFG extraction wells were installed in June 2012, only a couple months before liquid blocked the perforations.

The fact that several of the LFG wells were not functioning as designed due to liquid inundation is unusual. Cell CC-2 is a relatively new cell and the waste deposited there is just over 1 year old. Also, SCL is considered a semi- arid site with annual rainfall of less than 22 inches. Both of these conditions typically result in relatively dry waste and limited landfill gas production for waste of this age.

We understand the CC-2 area is the only area in SCL where a 9-inch thick daily cover required by local regulators was used from its inception. (The California Code of Regulations, Title 27, (Title 27) Sections 20680 and 20705 requires a minimum of 6 inches of compacted earthen materials. Prior to the 9-inch thick requirement, SCL used re-useable tarps as an alternative daily cover (ADC).) In addition, the 9-inch thick daily cover is required to remain in place when the next lift of waste is placed, which is contrary to typical landfill operations and good operational practices. The 9-inch thick daily cover soil requirement results in discrete, isolated cells of waste, each surrounded by soil, that tends to inhibit proper LFG control and percolation of liquid in the cell to the underlying leachate collection and removal system. This requirement also consumes valuable airspace and results in higher operational costs.

4. Conclusions and Recommendations

4.1 Conclusions

It appears that the non-functional LFG extraction wells in the CC-2 area may have been the largest single factor contributing to the offsite odors during the subject period. The 10 new LFG extraction wells that Republic installed to augment the non-functional wells are screened at shallower depth intervals and are reported to be performing well at the time this TM was completed. The flare shutdowns most likely also contributed to the offsite odors, although we believe to a lesser extent than the non-functional wells.

The requirement to place a 9-inch thick daily cover soil and then leave the daily cover soil in place is unusual and counterproductive. This requirement:

- Hinders effective LFG control that can result in LFG migration issues and resulting odor issues
- Can result in perched liquid layers, as evidenced in the CC-2 area, that can render LFG extraction wells non-functional, produce leachate seeps and excess pore pressures potentially destabilizing the waste mass
- Increases operational costs through excavating, moisture conditioning and placing the soil every day instead of stripping and reusing the daily cover soil or using tarps or other approved ADC material

- Increases operational costs by having to replace or augment wells filled with liquids more frequently than typical
- Results in lost airspace with no discernable benefit

4.2 Recommendations

In order to manage conditions at SCL that can result in offsite odor complaints, we recommend:

- Working to rescind the requirement for a 9-inch thick daily cover and resume using tarps and/or another approved alternative daily cover material that is effective at meeting the requirements of Title 27, SCL's Odor Plan of Action dated June 15, 2012 and good landfill operational practices
- Continuing to diligently manage odiferous loads using the various methods described in the June 2012 Landfill Odor Plan of Action
- Continuing to work toward completing improvements and fine tuning the improved GCCS
- Continuing to use a combination of vertical LFG extraction wells for intermediate and deep LFG control and horizontal LFG extraction wells for early and shallow LFG control
- Characterizing liquid levels and possible zones of waste saturation in the CC-2 area
- Developing alternatives to reduce the liquid levels in the CC-2 area such as dewatering the wells
- Minimizing flare downtime
- Continuing routine and preventative GCCS maintenance

5. Closure

Brown and Caldwell appreciates to opportunity to provide services for this project. The findings and conclusions presented in this TM were prepared in accordance with generally accepted geoenvironmental engineering practices in the area at the time this report was completed. No other warranty, express or implied, is made.

Please call Michael Yacyshyn (916-853-5328) if you have any questions or comments.

CORNERSTONE
Environmental Group, LLC

7600 Dublin Boulevard, Suite 200 • Dublin, CA 94568 • (877) 633-5520 • Fax: (925) 560-9879

September 24, 2012

Anthony Bertrand, P.E.
12949 Telegraph Rd
Santa Fe Springs, CA 90670

Re: Sunshine Canyon Landfill – Cover Soils
Project Number 120495

Dear Mr. Bertrand:

Republic Services, Inc. (Republic) retained Cornerstone Environmental Group, LLC (Cornerstone) to conduct a review of the landfill gas (LFG) collection and control system (GCCS) at the Sunshine Canyon Landfill (Landfill) in Sylmar, California. Cornerstone provided Republic with a detailed GCCS review report (report) titled, *Landfill Gas Collection and Control System Evaluation Report*, dated September 24, 2012, summarizing the review and providing recommendations to improve the GCCS wellfield. Cornerstone's report notes approximately 207 wells which are currently not controlling LFG based on high methane readings in the wells. Of these 207 wells, 53 wells are impacted by liquids, with approximately 40 percent of those wells located in areas filled in the past two years (2010 through 2012). This is a much higher percentage than any other area within the landfill. In addition, all LFG extraction wells recently installed in the new Cell CC-2A, have been reported by Republic to be full of liquids.

Cornerstone understands that in 2010, site operations began using a nine-inch soil layer over daily compacted waste. This soil layer is <u>not</u> removed prior to additional waste placement. It is possible that these soil layers may not allow liquids within the landfill to drain through the waste mass to the underlying leachate collection and removal systems and could lead to "perched" liquids in the landfill waste mass. This is similar to "perched" liquids that often form when a barrier, such as an old road or compacted soil layer traps liquids at various elevations beneath the surface of the landfill. When perched liquids are encountered during drilling LFG wells, it is often observed that the liquids drain from the LFG well boring into the underlying waste mass upon penetration of a low permeable layer as evidenced in the drill cuttings.

Recent fill areas where the 9-inch daily cover soil layers were used show a much higher percentage of wells with negative liquids impacts. Additionally, wells in Cell CC-2A are reportedly full of liquids. Cornerstone believes that the daily 9-inch soil layers that are not

removed, and thus buried, may be the main cause of the liquid within the wells. It is Cornerstone's opinion that the removal of the daily soil lifts immediately prior to additional refuse placement would greatly improve the ability of the liquids in the landfill to drain to underlying leachate collection and removal systems. This in turn would likely result in landfill gas extraction wells installed in new fill areas to operate more efficiently, as perforated portions of the wells would not be covered by liquids.

If you have any questions regarding this issue please do not hesitate to contact us.

Sincerely,

Maura Dougherty, P.E.
Senior Project Manager

Paul Stout, P.E.
Senior Client Manager

Enclosure:
cc

A TETRA TECH COMPANY
BRYAN A. STIRRAT & ASSOCIATES
Civil & Environmental Engineers

September 12, 2012

Mr. Anthony Bertrand, P.E.
Area Environmental Manager
Republic Services, Inc.
12949 Telegraph Road
Santa Fe Springs, CA 90670

RE: DAILY COVER VS. PERCHED LIQUIDS AT THE SUNSHINE CANYON LANDFILL

Dear Mr. Bertrand:

Based on field observations, liquid is accumulating in many of the new landfill gas (LFG) wells installed in Cell CC-2 and blocking gas extraction. It is understood from discussions with Republic Services that in September, 2010 the Los Angeles County Department of Public Works (DPW) has required that Republic Services change its normal practice and NOT remove the 9 inches of daily cover soil prior to placing the next lift of refuse.

Native soil use for cover at Sunshine Canyon is generally classified as silty sand (SM), clayey sand (CS) or clay (CL), all of which are relatively impermeable. The material is substantially mixed by the placement process. The daily cover layers comprised of these materials would have a vertical permeability or hydraulic conductivity much lower than typical Municipal Solid Waste (MSW). This could result in liquids (leachate) being "perched" above each daily cover layer. Investigations at Southern California MSW landfills using pore pressure measurement techniques have documented the phenomena. Landfill gas wells screened in the zones of perched liquids would provide a path for the liquids to drain into the well, resulting in blockage of the gas extraction from the flooded portions of the screened well. Data from field measurements and down-hole camera work performed on August 27, 2012 in several of the recently installed LFG extraction wells show 25 to 32 feet of liquid in the wells and a video of Well CGW-674 clearly shows liquid flowing down the casing walls from intermediate depths in the casing. This data confirms that liquid is entering the LFG wells through slots at various depths.

In conclusion, the data suggests that the Los Angeles County DPW requirement to place 9 inches of daily cover soil at the end of each day and not remove it before commencing daily landfilling operations has created relatively impermeable lenses in the landfill that are likely causing leachate accumulation in the LFG wells, thereby interfering with the performance of the wells. This problem would likely be avoided by removing the 9 inches of soil before beginning landfilling operations.

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A TETRA TECH COMPANY
BRYAN A. STIRRAT & ASSOCIATES
Civil & Environmental Engineers

Should you have any questions or require additional information, please advise.

Sincerely,

Michael L. Leonard, Sr., P.E.
Senior Project Manager
Methane Gas Group

c: G.E. Andraos
Gary Glasser
Sami Ayass
Cy Chidiac
Achaya Kelapanda

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A-Mehr Inc.

Professional Engineers and Scientists Specializing in Landfills

23016 Mill Creek Drive **Phone (949) 206-0157**
Laguna Hills, CA 92653 **Fax (949) 206-9157**

September 14, 2012

Anthony Bertrand, P.E.
Area Environmental Manager
Sunshine Canyon Landfill
1474 San Fernando Road
Sylmar, California 91342

RE: Sunshine Canyon Landfill
Modification of Odor Abatement Corrective Measures

Dear Mr. Bertrand:

In a letter dated September 27, 2010 the Department of Public Works (DPW) directed Sunshine Canyon Landfill to implement a series of corrective measures to mitigate odor conditions at the landfill. Since that time Sunshine Canyon has implemented the following measures specified in the DPW letter:

1. Terminate use of alternative daily cover:
2. Cover waste with a minimum of nine inches of compacted soil at the end of every operating day;
3. Discontinue the practice of removing compacted soil cover at the beginning of the operating day; and
4. Prepare and implement an Odor Mitigation Plan including:
    - Measures implemented pursuant to the AQMD's Order for Abatement dated March 24, 2010;
    - A program for managing odoriferous waste loads;
    - An odor patrol program; and
    - A landfill gas mitigation plan

We believe the measures 1, 2 and 3 listed above relative to daily cover are ineffective and counter-productive, and should be eliminated. The measures listed under (4) are proving to be effective, and should be continued and enhanced until odor complaints have been eliminated.

In a letter to DPW dated April 18, 2011 Sunshine Canyon requested relief from the requirement to cover waste with 9 inches of daily cover and the prohibitions of alternative daily cover and reclaiming of cover soil prior to placing additional refuse on the following day. A-Mehr, Inc. fully supports that request, and recommends that Sunshine Canyon and the DPW work together to modify the odor abatement program to improve its performance and mitigate several unintended consequences of the measures directed by DPW and implemented to date.

We have observed that Sunshine Canyon has exerted major efforts to improve the collection of landfill gas, including:

- Installation of over 19,000 feet of new piping;
- Extensive maintenance work on individual wells;
- Addition of four new condensate collection sumps to reduce the incidence of condensate blockages in collection pipes;
- Installation of more than 20 new gas extraction wells;
- Construction of a new 36-inch primary header pipe;
- Installation of an additional gas flare and blower system; and
- Installation and operation of an on odor control misting system at the active disposal area and near the front gate of the landfill.

Based on our experience and knowledge of the site, we believe that the most effective measures for reducing odor problems at Sunshine Canyon are those related to landfill gas and the odor control misting system. We believe the least effective measures are those related to daily cover, which also have adverse side effects on landfill operations and environmental controls.

The practice of placing compacted soils at the end of each day and not removing it before placing additional waste on subsequent days creates a series of small waste cells separated by barriers of soil. Native soil used for cover at Sunshine Canyon is generally classified as silty sand (SM), clayey sand (SC) or clay CL), all of which are relatively impermeable. Experts in the solid waste industry have recognized potential problems associated with use of low hydraulic conductivity cover soils. Professor David Daniel noted the effects of cover soil on leachate management in Geotechnical Practice for Waste Disposal (Chapman and Hall, 1993):

> *One problem that daily cover can create is hydraulic isolation of one cell from another. If the daily cover consists of relatively impermeable soil, water cannot migrate uniformly through the waste. Instead, water will be channeled in the landfill. Some cells may be saturated with water and others may be virtually dry. Wide variation in moisture conditions leads to problems with differential settlement and leachate collection. If leachate will be reintroduced to the disposal unit (Leachate recirculation), it is particularly important that daily cover has a high hydraulic conductivity. A common manifestation of low-hydraulic -conductivity daily cover is the appearance of leachate seeps on landfill covers: leachate flows laterally along the surface of daily cover rather than infiltrating downward, until the leachate "daylights" on the sloping cover of a landfill.*

Leachate generated within the small cells is impeded from percolating downward to the leachate collection system at the landfill bottom, potentially resulting in leachate seeps from side slopes and saturation of gas wells. Both of these adverse events have previously been observed at Sunshine Canyon. Leachate seeps are likely to reoccur with greater frequency during the rainy season, likely resulting in WDR violations and odor issues related to leachate seeps during the time of year when control of seeps is most difficult.

Landfill gas management is significantly affected by daily cover soil:

> *The natural tendency of landfill gases that are lighter than air, such as methane, is to move upward, usually through the landfill surface. Upward movement of landfill gas can*

> *be inhibited by densely compacted waste or landfill cover material (e.g., by daily soil cover and caps). When upward movement is inhibited, the gas tends to migrate horizontally to other areas within the landfill or to areas outside the landfill, where it can resume its upward path. Basically, the gases follow the path of least resistance.* (Cheremisnoff, Nicholas P., Handbook of Solid Waste Management and Waste Minimization Technologies. Butterworth-Heineman, 2003.)

Landfill gas vertical extraction wells, which form the great majority of LFG collectors at Sunshine Canyon, are generally installed after refuse depths in an area reach 75 to 100 feet, and are installed with perforations in the lower 2/3 to 3/4 of the well, and solid pipe near the surface. As additional refuse is placed, the solid pipe section is raised, and the vacuum on the well adjusted to draw gas in upper layers down toward the perforated sections of the collection pipe. If relatively impermeable layers of cover soil impede the downward flow of gas, the well becomes ineffective for control of gas near the surface and can contribute to surface emissions and odor problems at the site.

The problem is exacerbated by the buildup of leachate in gas wells that occurs when daily cover soil barriers prevent vertical migration of leachate to the leachate collection and removal system. Leachate has been observed to collect in gas wells at Sunshine Canyon, rendering them ineffective for removal of gas, which then migrates to the surface to add to the odor problem.

In addition to their adverse effects on control of landfill gas, leachate and odor, the practices of using 9 inches of soil daily, not using alternative daily cover, and not removing soil for reuse before placing additional refuse contribute to significant operational issues in conflict with provisions of the Conditional Use Permit (CUP) and approved Joint Technical Document (JTD) for the landfill:

- The additional soil used as cover consumes landfill disposal capacity, hampering efforts to maximize the amount of solid waste that can be disposed in the facility as required by County CUP Condition 23.

- Excessive use of on-site soil for daily cover will result in future shortfalls of cover soil and require importation of soil for daily, intermediate and final cover, with adverse environmental and financial impacts to landfill operations.

Use of alternative daily cover to reduce soil use and waste of airspace capacity is universally practiced throughout the solid waste industry and specifically at landfills in Southern California. In light of the progress made in reducing off-site odor complaints and the above adverse effects of the restrictions on daily cover, we strongly recommend that Sunshine Canyon repeat your request for the following modifications to the conditions imposed by the DPW letter of September 27, 2011, listed in order of importance:

1. Cover soil may be removed prior to placement of additional waste on top of previously disposed waste.

2. Daily cover soil, when applied, may be a minimum of 6 inches thick as provided by 27 CCR 20680(a).

3. Alternative daily cover, including geosynthetic blankets or processed green material, may be used as described in the approved JTD and Solid Waste Facility Permit for the City/County landfill.

I will be pleased to join you in meeting with DPW staff and the other regulatory agencies with responsibilities for air quality, water quality and disposal operations to discuss the benefits of our recommended changes. If there are any questions, please call me at (949) 206-0157.

Sincerely,

M. Ali Mehrazarin, P.E.
Principal Engineer

ATTACHMENT 3

REPUBLIC SERVICES

October 12, 2012

Mr. Pat Proano, P.E., M.P.A.
Assistant Deputy Director
County of Los Angeles, Department of Public Works
Environmental Programs Division
900 South Fremont Avenue
Annex, 3rd Floor
Alhambra, CA 91803-1331

RE: REVISED OPERATIONS PLAN FOR REMOVAL OF DAILY SOIL COVER, SUNSHINE CANYON LANDFILL

Dear Pat:

As discussed during the meeting held on October 2, 2012, we believe the measures we have implemented at Sunshine Canyon Landfill (SCL) to address the requirements in the Los Angeles County Department of Public Works (DPW) letter dated September 27, 2010, are demonstrating to be detrimental to certain aspects of the site's gas collection and control system (GCCS) and the facility's comprehensive plan to address and mitigate the potential for off-site odors. Specifically, we believe the requirements to place and compact nine (9) inches of daily soil cover material coupled with the inability to remove this layer the following working day, has led to an increase in liquid accumulation in gas collection wells which is (1) impacting the system's efficiency in collecting gas, and (2) likely contributing to the potential odor issue due to the system's inability to capture landfill gas as designed. In our opinion and that of our four expert independent consultants, continued implementation of these requirements is likely to lead to exacerbation of this situation and could add to the potential for landfill gas to escape the landfill.

The overall purpose of discontinuing the placement of 9 inches of daily soil cover material is to prevent the occurrence of perched liquids in the waste mass in the current and future cells. The finding of liquid in wells in the CC-2 area is indicative that the soil layers are acting as a vertical barrier impeding the downward drainage of these liquids to the leachate collection system as designed. The site has responded to this finding by implementing an aggressive schedule to de-water gas wells in conjunction with the landfill gas operations and maintenance (LFG O&M) program already in place at the site. However, this is not an optimal solution, as water will continue to collect in wells unless we are allowed to remove the 9 inches of daily cover soil when we start disposal operations each morning. The 9 inches of soil also prevents landfill gas from flowing freely into our vertical and horizontal gas collectors and defeats much of the purpose of

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the Air District's requirement that horizontal gas collectors be installed every 40 feet as the landfill is filled.

The purpose of this letter is two-fold: (1) provide information to DPW on our aggressive LFG O&M program designed to improve the efficiency of the gas control and collection system (GCCS) and control surface emissions, and, (2) provide an operations plan to provide the DPW with information on our process for the removal of the daily cover soil material and the actions we will take to mitigate potential odor emissions during this process. This letter provides the following information:

- The site's current landfill gas operations and maintenance program including the procedures to tune the well field, monitor gas wells, improve system gas flow and extract liquids from wells;

- Proposed Operations Plan for the removal of daily cover soil material.

1.0 Landfill Gas Operations and Maintenance Program

An aggressive LFG O&M Program is currently in place at SCL and will continue to be followed for the foreseeable future. The LFG O&M Program consists of the following elements;

- Well monitoring;
- Weekly flare station inspections;
- LFG system inspection and maintenance

1.1 Well Monitoring

Monitoring of the sites 450 vertical gas wells, 50 horizontal collectors and 100 trench collectors, perimeter control wells and liner collectors is performed by our LFG O&M contractor to monitor system performance and implement adjustments to improve efficiency.

For any location subject to New Source Performance Standards (NSPS) requirements, valve adjustments are performed as a corrective action within the required 5-day period of time and re-checked within 15 days for compliance. If a corrective action in excess of a valve adjustment is necessary, this work is identified immediately by our LFG O&M contractor and a work order is submitted to complete the work.

The following data is collected at each monitoring point:

- ◊ LFG temperature
- ◊ Wellhead static pressure
- ◊ Header static pressure
- ◊ LFG methane concentration
- ◊ LFG oxygen concentration
- ◊ LFG balance gas concentration

- ◊ LFG flow rate

Data from the monitoring ports is used by our LFG O&M Contractor to identify low performing wells. The criteria for low performing wells is a combination of 1) high methane content, 2) low LFG flow, and 3) static pressure within 20% of the available system header. Inspection of the low performing wells is then conducted in accordance with inspection procedures discussed in below Section 1.3.

1.2 Weekly Flare Station Inspections

Each of the SCL's five flare stations (Flares 1, 3, 8, 9 and the temporary flare) is inspected on a weekly basis for the following:

- ◊ LFG control system flare station inlet static pressure, knock-out vessel inlet and outlet static pressure ;
- ◊ Extraction blower operating (inlet and outlet) temperatures and static pressures;
- ◊ LFG concentrations of methane, and oxygen, LFG temperature, and static pressure;
- ◊ Flame arrestor inlet and outlet static pressures and calculated pressure drop across operational flame arrestors;
- ◊ Compliance thermocouple selected location (i.e. top, middle, and bottom);
- ◊ Operating flare(s) operating temperature and operating temperature set points;
- ◊ Operating flare(s) high and low temperature shutdown set points;
- ◊ Operating flare(s) LFG flow rate (utilizing the permanently installed flow meter).

As with the well field monitoring, if a corrective action is identified by our LFG O&M contractor through the weekly inspections, immediate steps are taken to address the issue through the established non-routine O&M contracting process.

1.3 Landfill Gas System Inspection and Maintenance

The LFG system inspection and maintenance program is also a requirement for our LFG O&M contractor and part of the overall program to improve the efficiency of the GCCS. The inspection and maintenance program is designed to inspect and document aspects of the GCCS that are not covered by other regulatory requirements on a basis that will provide information for continued evaluation of the GCCS at the site.

The LFG inspection and maintenance program consists of the following:

- ◊ Perform integrity inspections of all gas collection systems (well head, valves, associated piping), including inspection of lateral and header pipe slope for proper condensate drainage;

- ◊ Perform monthly documented inspections on all condensate management systems including each condensate sump and its function;

    - ◊ Perform weekly documented integrity inspections on all LFG control systems;

    - ◊ Perform water level measurements at vertical wells each quarter. Wells will be monitored for liquid level based on the sequence of the physical geographic locations. This method will be followed on remaining subsequent wells each quarter. Well LFG composition, temperature, and flow will be measured using a LANDTEC GEM-2000 instrument prior to well liquid level sounding;

    - ◊ Perform camera audits, as required, each quarter at vertical wells. Based upon the monitoring results of the extraction components, wells will be selected that may benefit from the additional camera inspection. The information collected during the sounding of the extraction wells may also be used to determine the wells that will have a down-hole camera inspection performed. The recording of the camera inspections will be provided to RSI on a quarterly basis within 30 days following the end of the quarter. Additionally, well LFG composition, temperature and flow will be measured using a LANDTEC GEM-2000 prior to down-hole video camera inspection;

    - ◊ Perform a monthly cover integrity inspection. Cover integrity will be assessed and then recorded on a Cover Integrity Monitoring Form;

    - ◊ Replace wellheads; flex piping, and monitoring ports. Any additional materials and or labor will be performed or provided in a RSI approved work order prior to commencement of such work.

Deficiencies identified in the field will be submitted to SCL staff detailing issues that need to be addressed as they relate to compliance and integrity of the system, and corrective actions that have been taken.

For the flare stations, the following actions in addition to those discussed in Section 1.2 will be performed:

- ◊ Each of the five flare stations will be monitored on a daily basis. Monitoring will include obtaining landfill gas composition, temperature, static pressure and flow. A daily check box form will be completed and submitted to RSI.

- ◊ Perform weekly monitoring on all condensate management systems including each condensate sump and its function.

- ◊ Each of the five flare stations will also be monitored in accordance with the SCAQMD Rule 431.1 Alternative Monitoring Plan approved as of April 1, 2003. Upon receiving the Total Sulfur monitoring results after each event, the project engineer will notify RSI and will confirm the action level required based on the Tier parameters. Lab analysis fees will be incurred by RSI on a non-routine basis.

2.0 Operations Plan for the Removal of Daily Soil Cover

At present, some aspects of SCL's daily operations in the morning hours are dictated by specific conditions in the Stipulated Order for Abatement (A/O) dated March 24, 2012. These conditions will continue to be met as described briefly below.

Condition 1: This condition requires that loads from Republic-operated transfer stations are not deposited at the active Working Face from 6 AM to 9 AM on Mondays or any other from 6 AM to 9 AM when adverse wind conditions are measured. The Condition also requires SCL operations to restrict the working face size to 30,000 square feet or less on Monday mornings from 6 AM to 10 AM and any other morning (6 AM to 10 AM) when adverse wind conditions are measured.

This Condition is met by SCL not allowing transfer trucks under the control of Republic Services to bring their loads to the site until after 9 AM on all mornings regardless of the wind conditions. This decision was made by Republic in mid-October 2011, and this practice has been continued since that time.

SCL Operations restricts the size of the working face to less than 30,000 square feet every morning until 10 AM regardless of wind conditions.

Condition 2: This condition requires a working face perimeter misting system to be in place as well as at least one DustBoss at the working face to be operated from 6 AM to 10 AM on all days adverse wind conditions are measured during these hours.

This condition is met on a daily basis. A working face perimeter misting system is in place and at least one DustBoss is operated in accordance with the requirements of Condition 2 every morning from 6 AM to 10 AM.

2.1 Operations Plan Details

Removal of the daily soil cover will be conducted incrementally as shown on Figures 1 – 4 attached to this letter. It should be noted that these figures are intended to provide a conceptual overview of the operations at the working face to demonstrate to DPW how SCL intends to remove the nine inches of daily soil cover in a responsible and effective manner to allow operations activities to be conducted as necessary, but also to provide mitigation measures to control potential emissions from this activity.

Odor Mitigation

Odor mitigation at the working face is addressed by the placement of the DustBoss (as required by Condition 2 of the A/O), the working face perimeter misting fences, and the odorous load management procedures.

The DustBoss is put in place and set up for the morning operations the night prior. It is the responsibility of the closing Supervisor to ensure the tank is full of water/neutralizer solution, there is fuel in the generator and the DustBoss is placed in the optimal location to address potential emissions from the working face that could be carried off-site from adverse wind conditions. Condition 2 of the A/O requires SCL to have one DustBoss operational at the working face; it is SCL's intent to operate two DustBosses for the purpose of controlling potential odors from the working face.

Odors potentially caused by the removal of the daily soil cover material will be monitored by the opening Operations Supervisor. In addition to the DustBoss, a water truck filled with water/neutralizer solution will be available to deploy should the Supervisor deem it necessary to control odors. The Supervisor also has the authority to stop the removal of the daily soil cover if necessary.

The following sections present an overview of the Operations Plan from opening to 10:00 AM.

2.1.1 Working Face Prior to Opening – Figure 1

Figure 1 depicts a conceptual view of the working face prior to the beginning of disposal operations on a typical day. As shown, the working face area is completely covered with the 9 inches of daily soil cover material placed the night before.

The DustBoss(es) are in place and operational assuming winds are from the north/northwest and a water truck filled with water/neutralizer solution is located close to the working face if needed.

The truck lanes to be used up to 10 AMhave been established as has the trash limit for the day's operations. Please note that as the day progresses, additional truck lanes are added.

From approximately 5:45 AM – 6:00 AM, the following activities will take place:

- The daily cover material at the interface of the previous day and the present day working faces will be stripped of soil cover down to approximately 3 – 4" above the previous day's trash elevation;
- The first three "lanes" of the working face will be stripped of daily cover material down to approximately 3 – 4" above the previous day's trash elevation.

It should be noted that during this time period (prior to opening), the daily soil cover is not completely removed; e.g. it is not taken down to the point where exposed trash is visible. Three to four inches (3 – 4") will remain in place so the clean soil can be re-used as cover material. If all the daily cover material was removed, it would likely result in too much "litter" in the material which would render it useless as daily cover material.

2.1.2 Working Face Operations 6:00 AM to 7:00 AM (Figure 2)

Figure 2 depicts a conceptual view of the working face from 6:00 AM to approximately 7:00 AM. Three truck lanes are open and the daily cover material has been stripped from this area. Trash deposited on the ground is pushed over the "stripped" portion of the working face effectively covering this area. The remainder of the working face area remains covered with the 9 inches of daily soil cover material.

The odor mitigation measures (e.g. DustBoss(es), water truck) described previously remain in place.

2.1.3 Working Face Operations 7:00 AM to 8:00 AM (Figure 3)

Figure 3 depicts a conceptual view of the working face from 7:00 AM to approximately 8:00 AM. At least four truck lanes are open (based on volume and truck traffic, this could change) and the daily cover material has been stripped from this area. Operations continue as described in the previous section with new trash covering the area of the working face that has been stripped of the daily cover soil.

The odor mitigation measures (e.g. DustBoss(es), water truck) described previously remain in place.

2.1.4 Working Face Operations 8:00 AM to 10:00 AM (Figure 4)

Figure 4 depicts a conceptual view of the working face from 8:00 AM to approximately 10:00 AM. At least six truck lanes are open (based on volume and truck traffic, this could change) and the daily cover material has been stripped from this area. Please note that even with 6 truck lanes open and a working face depth of 200 feet, the total working face area is less than 30,000 square feet (19,600 square feet).

Operations continue as described in the previous section with new trash covering the area of the working face that has been stripped of the daily cover soil.

The odor mitigation measures (e.g. DustBoss(es), water truck) described previously remain in place.

All cover soil placed the prior day will be removed by 10:00 AM.

Again, we are not asking for the complete elimination of the use of 9 inches of daily soil cover—we are only asking to be allowed to remove it from the working face when disposal operations begin the next morning and the working face is covered with fresh garbage. We believe this will not increase the potential for off-site odors from our operations but, instead, will significantly improve the operation of our landfill gas collection system approved by the Air District, helping us to reduce the potential for landfill gas to escape the landfill and potentially cause off-site odors. We believe the procedures outlined above address DPW's concerns regarding the potential for odors to be generated from the working face area.

I am available to discuss this matter at your convenience. You may reach me at (818) 256-9946 or via email at abertrand@republicservices.com.

Sincerely,
Republic Services

Anthony Bertrand, P.E.
Area Environmental Manager – Los Angeles

Attachments

cc: David Cieply, Republic Services
Kurt Bratton, Republic Services

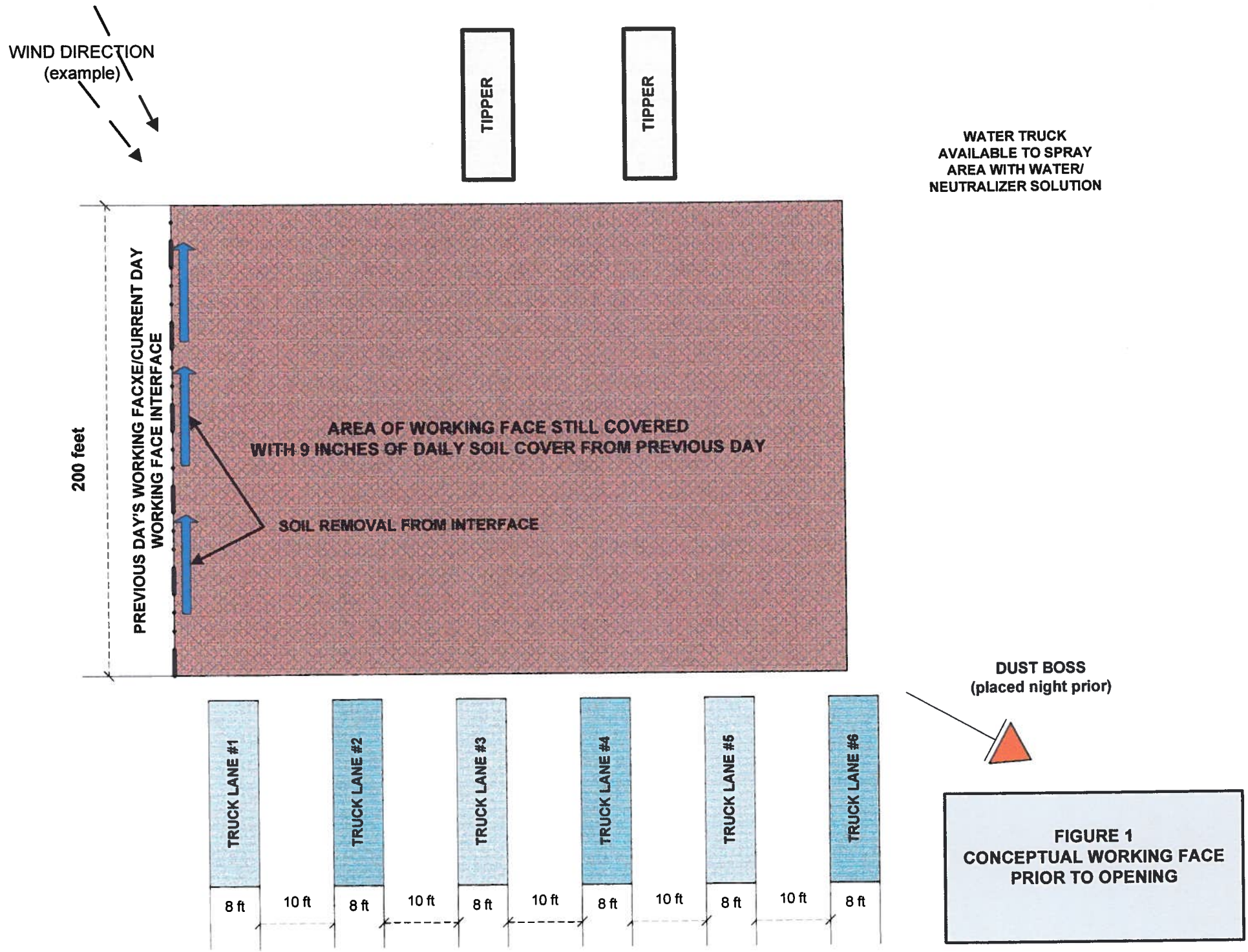

FIGURE 1
CONCEPTUAL WORKING FACE
PRIOR TO OPENING

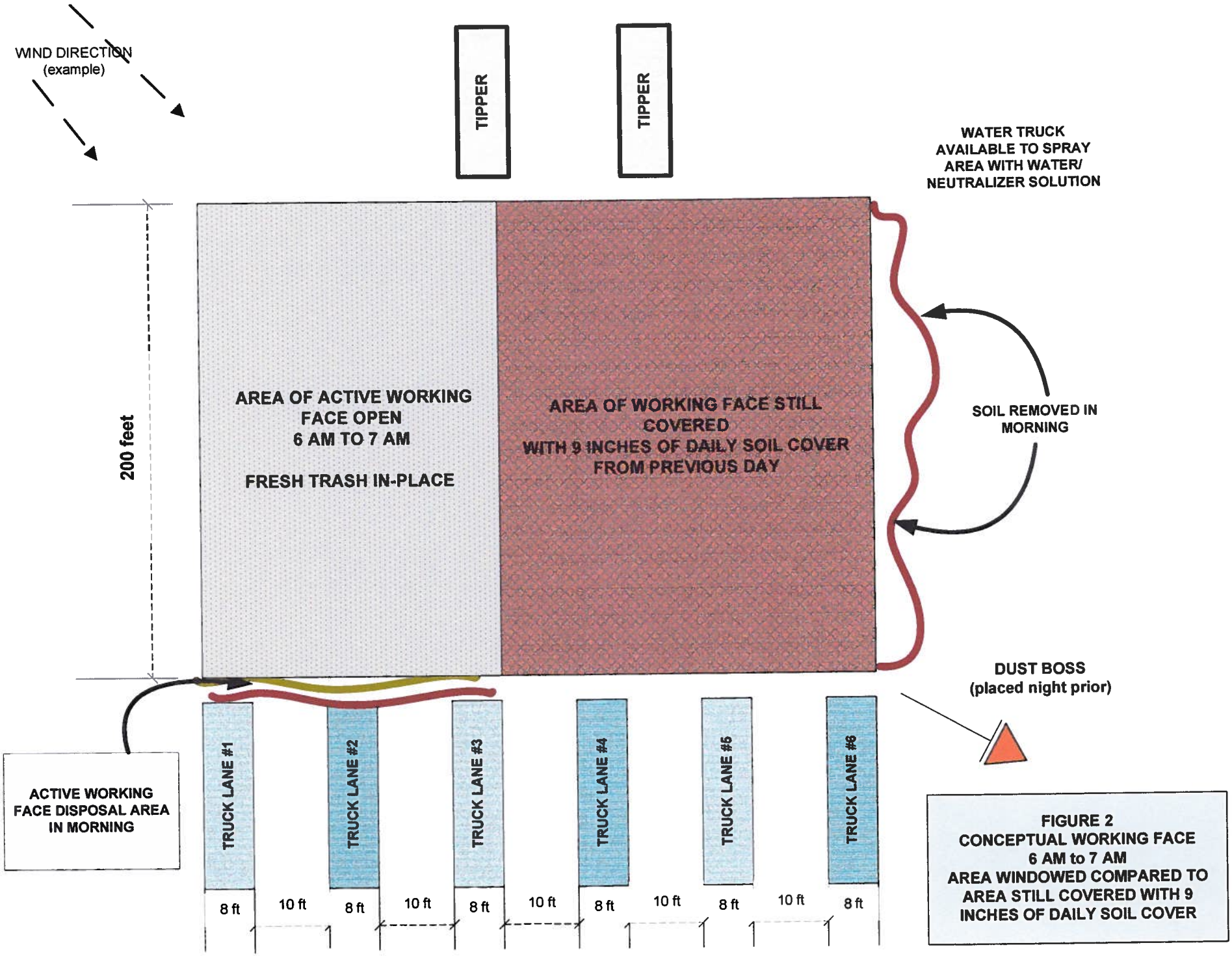

FIGURE 2
CONCEPTUAL WORKING FACE
6 AM to 7 AM
AREA WINDOWED COMPARED TO
AREA STILL COVERED WITH 9
INCHES OF DAILY SOIL COVER

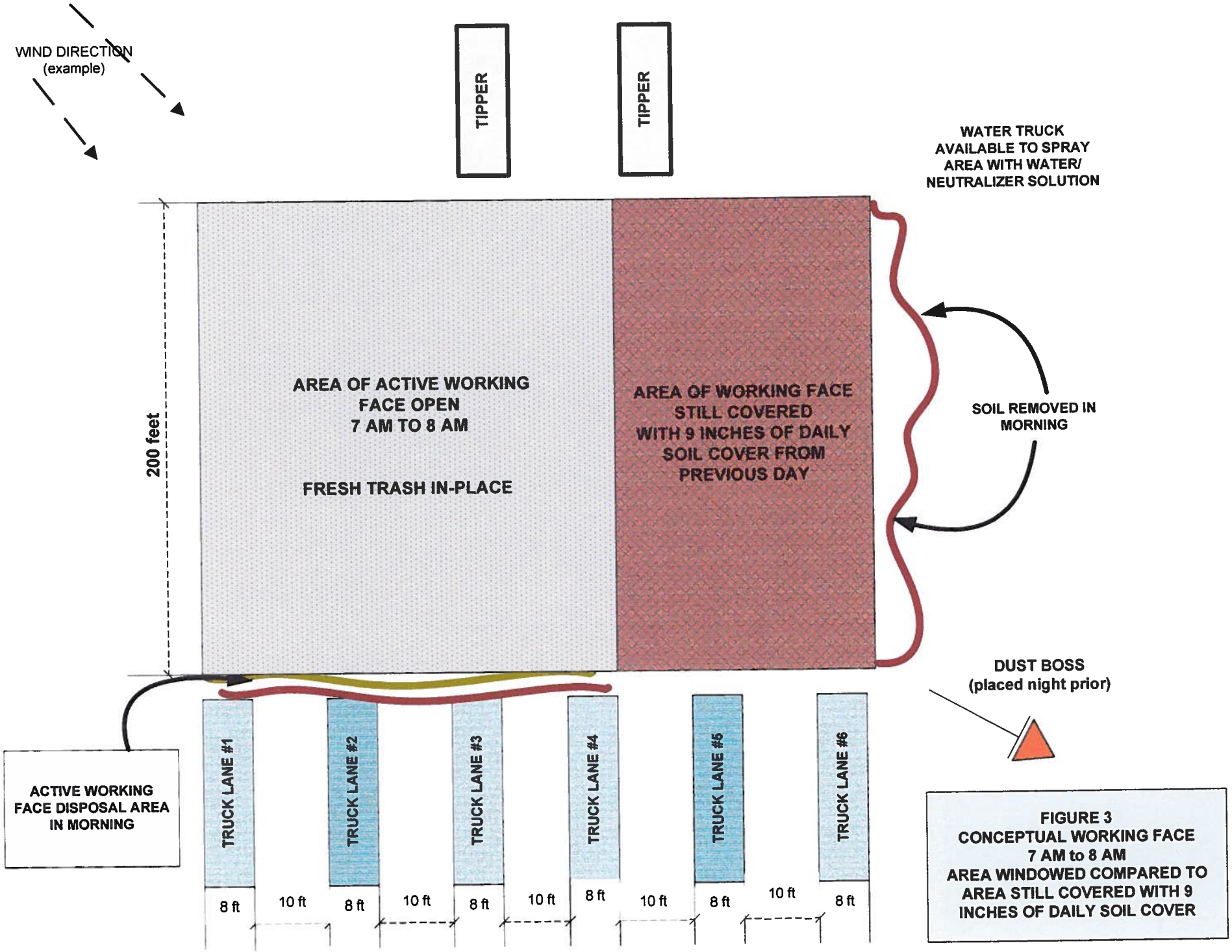

FIGURE 3
CONCEPTUAL WORKING FACE
7 AM to 8 AM
AREA WINDOWED COMPARED TO
AREA STILL COVERED WITH 9
INCHES OF DAILY SOIL COVER

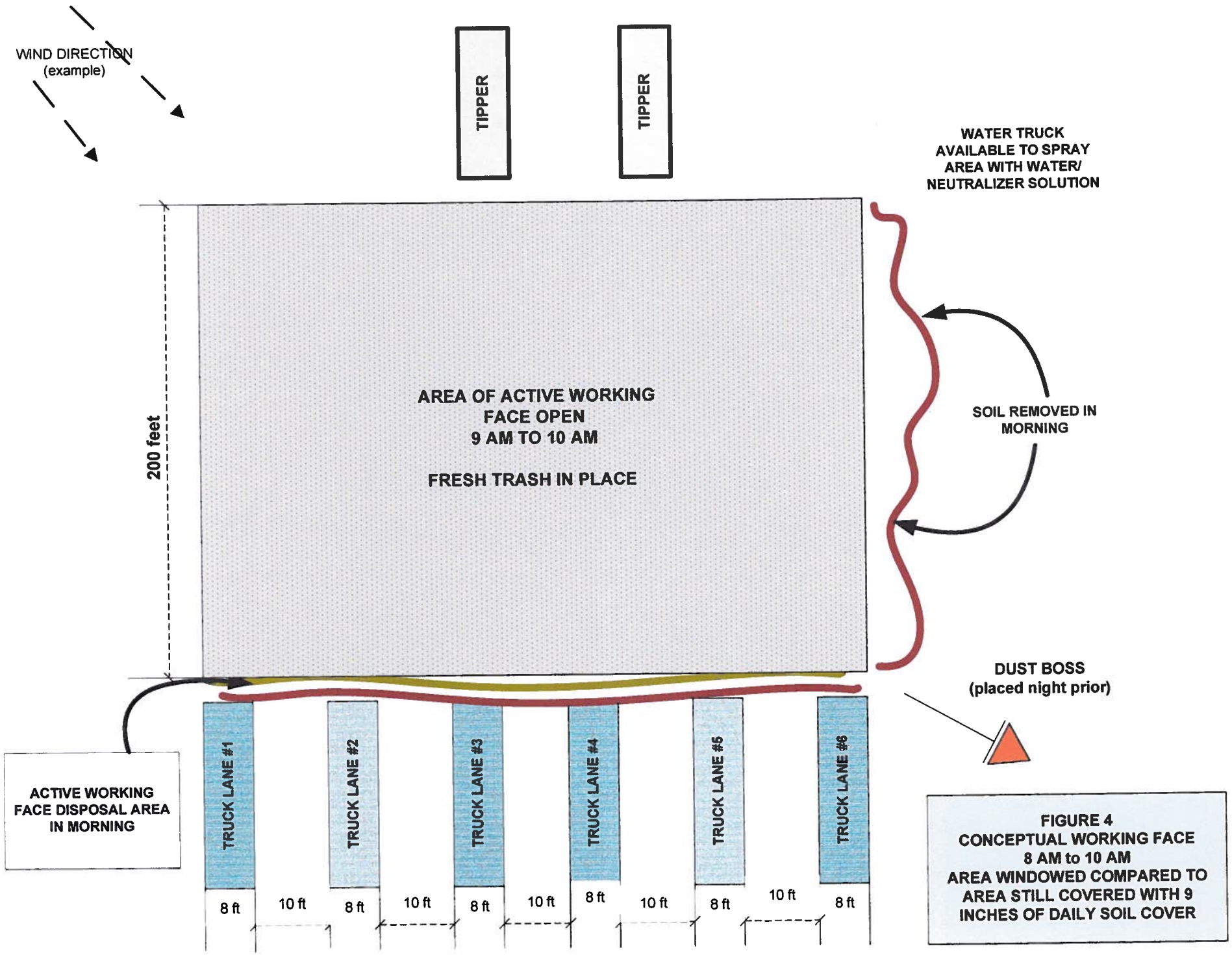

FIGURE 4
CONCEPTUAL WORKING FACE
8 AM to 10 AM
AREA WINDOWED COMPARED TO
AREA STILL COVERED WITH 9
INCHES OF DAILY SOIL COVER

ATTACHMENT 4

White Paper

Assessment of Alternative Daily Cover Related to Origin and Control of Landfill Odor

Prepared by:

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Prepared for:

Sunshine Canyon Landfill
14747 San Fernando Road
Sylmar, CA 91342

December 18, 2012

Contents

1. Introduction

Sunshine Canyon Landfill (SCL) is a Class III municipal solid waste landfill currently owned and operated by Browning Ferris Industries of California, Inc. (BFI / Republic Services, Inc.). Operations began at the site in 1958 in the south side of the canyon within the City limits of Los Angeles. In the 1990's, operations ceased within the City limits and began on the north side of the canyon within the jurisdiction of Los Angeles County. In 2005, the City portion of the site re-opened and in late 2009, landfill operations were joined into a single, contiguous landfill operation which presently continues under a joint permit issued by CalRecycle (Facility No. 19-AA-2000).

Within the 1,036 acre landfill property, 363 acres are permitted for waste disposal. In the normal course of filling operations, the landfill's waste permit has increased within the permitted area. Current projections indicate that by the end of 2012, approximately 40,331,000 cubic yards of airspace will have been consumed with waste material and cover soil.

1.1. Purpose of this Report

Blue Ridge Services (BRS) was hired to evaluate information related to site conditions that relate to the off-site odor issue at SCL to:

- Evaluate the validity and effectiveness of the requirement of nine (9) inches of soil cover as a mitigation measure for the reduction of off-site odors as compared to the regulatory standard of six (6) inches of soil or an approved Alternative Daily Cover (ADC) material, and,
- Make a determination of potential site conditions that have historically contributed to the off-site odor issue, and,
- Provide recommendations for the most effective alternative(s) for daily cover to prevent off-site odors based on available regulatory requirements and site-specific conditions at SCL.

The purpose of this report is to provide the results of the evaluation of information and site data and present the findings and recommendations.

1.2. Background

A review of the complaints made to South Coast Air Quality Management District's (SCAQMD) hotline complaint logs from 2008 to the present indicates that through August 2008, a maximum of one or two odor complaints attributed to SCL regarding potential off-site odors were called in to SCAQMD's hotline. There were many months during whichno complaints were made. Beginning in September 2008 with four (4) odor complaints, this pattern changed with a significant increase in the number of odor complaints attributed to SCL made primarily from residents in the neighborhoods located approximately 1.5 miles to the south/southeast of the site.

Since September 2008, there have been complaints made every month, and the number has increased to an average of 74 per month(September 2008 through September2012). The number of night complaints v. day complaints has gradually increased for several years, crossing a threshold in March, 2011 where night complaints generally have become more common. The criterion for defining day v. night complaints is 6:00 AM and 6:00 PM.

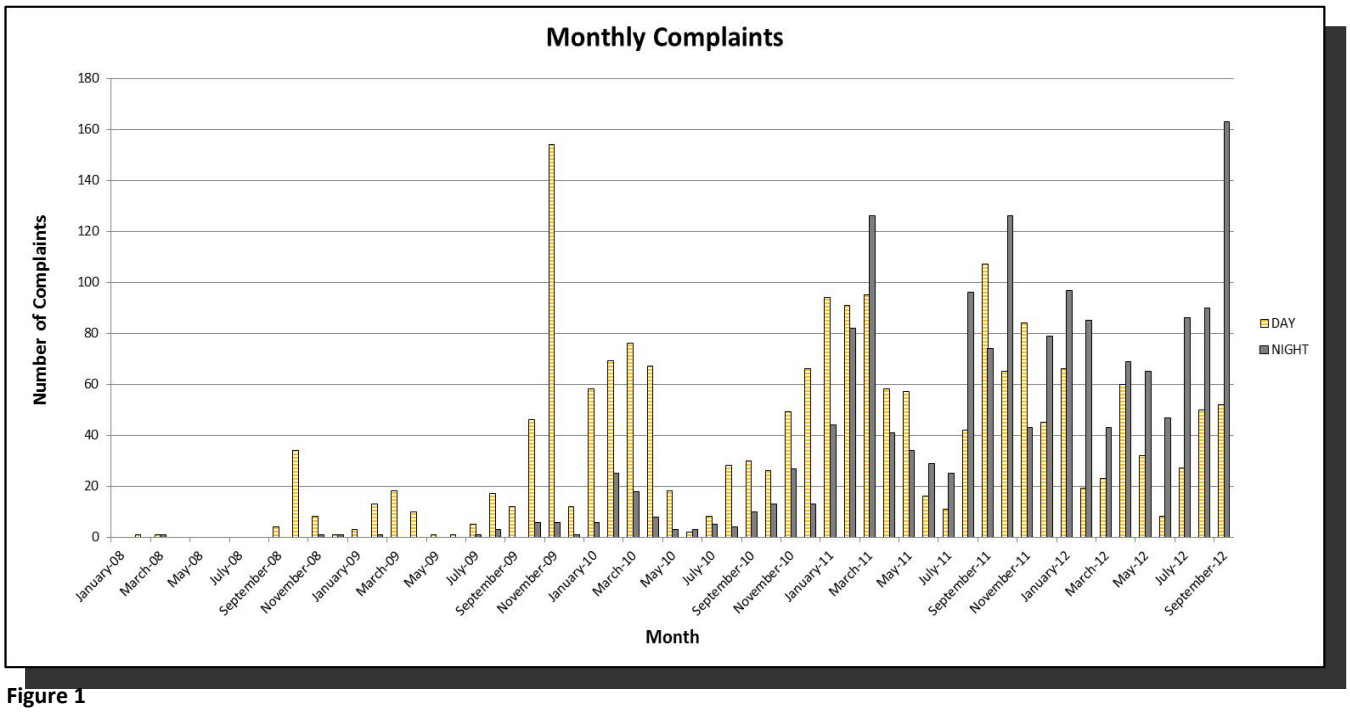

Figure 1

2. Regulatory Framework

SCL entered into an Abatement Order (A/O)(Case 3448-13) issued by the SCAQMD in March 2010 due to nuisance odors resulting in the issuance of multiple Notices of Violation (NOVs). Due to the characterization of the odors as "trash", the Conditions in the A/O focus primarily on operating criteria and other methods to abate odors from the working face that could potentially migrate off-site and create a nuisance condition. In September 2010, due to continuing off-site odor complaints, the Los Angeles County Department of Public Works (LACDPW) issued a letter to Republic Services requiring SCL to use nine (9) inches of daily cover soil material as a measure to mitigate off-site odors from the working face. This letter is included in Attachment 1 for reference.

An amendment to the A/O was signed in December 2011(Third Stipulated Amended Order for Abatement (S/O)). The S/O requires SCL to meet additional conditions that are primarily focused on improvements to the site's gas collection and control system (GCCS). The S/O was entered into in a cooperative agreement with SCAQMD after an engineering evaluation of the site's GCCS indicated upgrades were necessary to improve the system's overall collection capacity and effectiveness.GCCS upgrades at SCL were already in progress, however the S/O provides strict dates for compliance for the installation and operation of certain components of the GCCS.

The following sections briefly describe the requirements of each of these regulatory orders and the actions SCL has taken to address the requirements of each.

2.1. Requirements of December 2010 Abatement Order

As previously stated, the conditions in the A/O focused primarily on actions that are required to be taken by SCL to abate and mitigate odors from the working face that potentially could migrate off-site to the surrounding neighborhoods. In response to the A/O, SCL currently implements the following actions:

- Transfer trucks under the control of Republic Services do not bring their loads to the site until after 9:00 AM on all Monday mornings and any other morning before 9:00 AM if adverse wind conditions are present at the site. This condition was met by SCL until mid-October when a management decision was made that no transfer trucks under the control of Republic Services would come to the site prior to 9:00 AM, irrespective of whether there were adverse or favorable wind conditions. This practice has been continued since that time;

- Republic restricts the size of the landfill working face size to 30,000 sq. ft. or less on Monday mornings and any other mornings when adverse wind conditions are present until 10:00 AM The size of the working face is measured on an hourly basis, recorded and approved by a site supervisor to verify compliance;

- A minimum of one DustBoss® misteris operated at the working face as prescribed;

- A working face perimeter misting system is used as prescribed;

- A perimeter misting system was installed as prescribed in the A/O. As of May 26, 2011 the perimeter misting system located on the southern berm of the City portion of the site was expanded by approximately 1000 feet and the nozzle height was increased to 15 feet. Another section of the misting system was installed along the main haul road up to the scalehouse area as required by the S/O;

- The main haul roads are sprayed with a water/odor neutralizer solution via water truck every two hours;

2.2. September 27, 2010Letter from County of Los Angeles Department of Public Works

On September 27, 2010, the County of Los Angeles Department of Public Works (DPW) issued a letter to Republic Services mandating that SCL meet the following corrective measures:

- *"Terminate the use of any alternative materials as daily cover other than compacted soil;"*
- *"Cover disposed solid waste with a minimum of 9 inches of compacted soil at the end of every operating day, Monday through Saturday and at more frequent intervals as necessary, to control vectors, fires, odors, blowing litter, and scavenging. Tarp may only be used to enhance the control of vectors or other nuisances but may not replace the use of soil."*
- *"Discontinue the practice of removing compacted soil cover at the beginning of an operating day. The compacted soil cover applied at the end of the previous operating day must be kept in-place."*

The authority for requiring these corrective measures is cited in CUP Condition No. 45.N which states the Director of Public Works has the authority to require SCL to implement additional corrective measures for odor complaints when "such measures are deemed necessary to protect public health and safety".

Republic Services personnel have been operating SCL in accordance with DPW's mandate since the issuance of this letter.

2.3. Third Stipulated Order for Abatement, December 2011

On December 3, 2011, the Third Stipulated Amended Order for Abatement (S/O) was signed between Republic Services and SCAQMD. The S/O includes additional conditions specifically related to improvements to the site's GCCS as well as extending the duration of the A/O requirements to XX 2013. Table 1 presents a summary of the requirements in the S/O and the status of each as of the date of this report. As shown on Table 1, a significant amount of work has been completed to upgrade the site's GCCS as required by the S/O. Additionally, Republic Services has completed other projects associated with ensuring the site's GCCS performs in an optimal manner. These projects are listed in Table 2.

2.4. Fourth Stipulated Order for Abatement, July 2012

In July 2012, the Fourth Stipulated Amended Order for Abatement was signed between Republic Services and SCAQMD. This Order extended the dates for Flare 9 to become operational due to a delay in receiving the Permit to Operate as well as defining dates for the permitting and operation of another flare, Flare 10. This Order extends the requirements of the A/O and S/O to December 31, 2013.

3. Regulatory Requirements for Use of Daily Cover

Placement of daily cover is a requirement of both Federal (Code of Federal Regulations (CFR) Subtitle D) and State of California(California Code of Regulations (CCR) Title 27) regulations. The Federal and State regulations applicable to daily cover requirements at municipal solid waste facilities are discussed in the following sections.

3.1. Federal Requirements for Daily Cover

40 CFR Section 258.21(a) of Subtitle D, states the following:

"Except as provided in paragraph (b) of this section, the owners or operators of all MSWLF units must cover disposed solid waste with six inches of earthen material at the end of each operating day, or at more frequent intervals if necessary, to control disease vectors, fires, odors, blowing litter, and scavenging,"

Alternative materials of an alternative thickness (other than at least six inches of earthen material) may be approved by the Director of an approved State if the owner or operator demonstrates that the alternative material and thickness control disease vectors, fires, odors, blowing litter, and scavenging without presenting a threat to human health and the environment."

3.2. State of California Requirements for Daily Cover

CCR, Title 14, Section 20680 states the following:

"Except as provided in ¶(b), and (f) and Section 20690, the owners or operators of all municipal solid waste landfill units shall cover disposed solid waste with a minimum of six inches of compacted earthen material at the end of each operating day, or at more frequent intervals if necessary, to control vectors, fires, odors, blowing litter, and scavenging. For the purposes of this section, the operating day shall be defined as the hours of operation specified in the solid waste facility permit, and may extend for more than 24 hours if operations are continuous."

4. Regulatory Framework for Use of ADC

The need for the use of alternative daily cover materials was recognized by the U.S. EPA and other regulatory agencies as early as 1993. In the EPA's Project Summary paper titled "The Use of Alternative Materials for Daily Cover at Municipal Solid Waste Landfills" (September 1993), the author states:

> *"The diminishing availability of landfill sites and associated solid waste management challenges are major issues nationwide. In addition, landfilling costs are increasing as more stringent regulatory requirements make design and operation more complex and attentive to health and environmental safeguards. This has prompted recent changes in landfill management and operational practices to conserve space, improve efficiency and enhance public acceptance. One such change is the emphasis being given to options for meeting daily cover requirements. These options include using alternative daily cover materials that help conserve landfill space and reduce cover soil requirements without diminishing health, environmental aesthetics and other site management and use standards."*

Both the Federal and California State solid waste facility requirements include the option for a solid waste facility to use alternative daily cover (ADC) in lieu of soil for daily cover material as long as it meets the intent of the regulations related to daily cover. The language in both the Federal and State of California regulations show similar intent in regard to performance of daily cover material whether it is soil or an ADC material. As stated, the intent of the daily cover requirement is to:

- Control vectors;
- Control fires;
- Control litter;
- Control scavenging;
- Control odors.

Section 20690 (a)(1) of Title 27CCR states:

> *"Alternative materials of alternative thickness for daily cover (other than at least six inches of earthen material) for municipal solid waste landfill units may be approved by the (local) Enforcement Agency (EA) with concurrence by Calrecycle (formerly the California Integrated Waste Management Board(CIWMB)), if the owner or operator demonstrates that the alternative material and thickness control vectors, fires, odors, blowing litter, and scavenging without presenting a threat to human health and the environment."*

Within the language and intent of these regulations, it is clear that ADC is understood to have the ability to control odors as well as six inches of daily cover soil. Specifically in California, this performance capability has been verified by CalRecycle. Calrecycle published a paper in October 2009[1] intended to satisfy the directive adopted by the Calrecycle in 2007 requiring ADC regulations be reviewed to ensure they "are grounded in the best available science, address changing market conditions and take advantage of developing technologies."

[1] Alternative Daily Cover White Paper – California Integrated Waste Management Board – October, 2009

In May 1990, Calrecycle adopted the "Procedural Guidance for the Evaluation of Alternative Covers". In response to this guidance, site-specific demonstration projects were conducted to make the determination of whether ADC can function as a barrier to vectors, progression of fires within a waste mass, odors, excess infiltration and scavenging. Approximately 110 site-specific demonstration projects were conducted at approximately 80 municipal solid waste landfills in California to provide the data. Fifty-five (55) projects were conducted using geosynthetic blankets.

Based on these demonstration projects, Calrecycle issued ADC regulations that became effective on February 3, 1998. These regulations established that "a number of ADC material types that did not require additional demonstration prior to making a request to use at a site." CalRecycle has affirmed the acceptance of ADC by stating that, "…Site-specific demonstration projects are no longer required for these ADC materials if used as specified."

It is noted that Title 27, Section 20690(a)(3) states that the use of ADC will be terminated if the performance requirements cannot be met.

SCL's Conditional Use Permit (CUP), No. 00-194-(5) adopted in January 2007, requires SCL to "Operate the facility in a manner that maximizes the amount of solid waste that can be disposed of in the landfill (Condition No. 23), by at a minimum:

- Investigating methods to reduce the volume of daily cover required at the Landfill as allowed by the appropriate regulatory agencies (CUP Condition No. 23.C);

4.1. Studies of the Effectiveness of ADC in Meeting Subtitle D Requirements

As part of this evaluation, numerous studies were researched for information relevant to the discussion of how 9 inches of daily cover soil material compares to ADC material in mitigating odors from a working face area. A study conducted at the Empire Sanitary Landfill in Taylor, Pennsylvania with permission from the Pennsylvania Department of Environmental Resources is of particular relevance to this evaluation. The study evaluated the performance of foam, conventional soil cover, and commercially available tarps/geotextiles as Subtitle D (equivalent) daily cover materials. Two uncovered areas of waste were used as a control.

The criteria used for evaluation included:

- Odor emission control;
- Methane emission control;
- Total non-methane hydrocarbon (TNMHC) emission control, and;
- Flammability.

For purposes of this report, only the information related to the first three bullets will be included.

Emission rate testing was conducted to obtain emission rate data from the working face of the landfill with and without cover material in order to determine odor, volatile organic compounds (VOCs), and semi-volatile organic compounds (SVOCs) control efficiencies of the materials mentioned above. Testing was done using EPA's surface isolation flux chamber. Odor samples were collected and analyzed by ASTM Method E679-79.

A summary showing the results of the testing of the emission rate testing is shown in Table A below.

Material	Measurements					
	Immediately After Placement			Next Day (10 – 14 hours after placement)		
	Odor	*Methane*	*TNMHC*	*Odor*	*Methane*	*TNMHC*
	% control			% control		
Foam (Rusmar)(6")	98	100	100	99	100	100
Soil (9")	99	0	93	99	0	93
Griffolyn (tarp)	99	100	100	99	85	98
Air Space Saver (tarp)	100	100	100	99	36	98
Fabrisoil (tarp)	82	100	0	82	85	0

Table A

Source: Comparison of Long Duration Foam, Synthetic Tarpaulin, Geotextiles, and Soil as Subtitle D Compliant Daily Cover Materials for Sanitary Landfills, Kittle and Schmidt, 1992.

The conclusions drawn from this study are as follows:

- Odor was controlled "very well" by all of the alternative daily cover materials except the Fabrisoil (which achieved 82% control) both immediately after placement and the next day;
- Methane was controlled most efficiently by the foam material that was tested. It should be noted that methane emissions were not controlled by the nine (9) inches of soil cover that was placed over the waste material. Methane emissions were controlled in varying degrees by the tarps that were tested;
- Total Non-Methane Hydrocarbons (TNMHC) emissions were controlled most efficiently by the foam and two types of tarps (Griffolyn and Air Space Saver);
- TNMHC emissions were controlled to a lesser degree by the 9 inches of soil cover and not controlled at all by the Fabrisoil.

5. Evaluation of the Effectiveness of Nine Inches of Daily Soil Cover as a Mitigation Measure to Reduce Off-Site Odors at SCL

As previously stated, Republic Services SCL operations personnel have been covering the working face with 9 inches of soil as a daily cover material as mandated by DPW since September, 2010. Tarps, which were previously used by site operations for daily cover, have not been used on-site since that time.As shown on Figure 1, odor complaints did not cease after this operational change was made. Complaints from residents in the neighborhoods to the south/southeast of SCL continued after September, 2010 and continue as of the date of this report. The use of 9 inches of daily soil cover has not had the desired effect of mitigating off-site odors.

The following sections present discussions of the daily operational activities related to the 9 inches of daily soil cover requirement compared to odor complaint times.

5.1. Odor Complaints Compared to Daily Activities

Complaints made to SCAQMD's hotline from January, 2008 through September, 2012 were sorted according to the time the calls were reported on the monthly complaint logs. Normal landfill activities related to opening the site for daily operations were compared to the peak periods of complaints to determine if there is a correlation between daily activities when odor emissions from the working face would be most likely to result in an off-site odor event, and the actual times when complaints were made to SCAQMD. As shown on the graph (See Figure 2), the majority of complaints occur between 6-8 AM and 6-11PM.

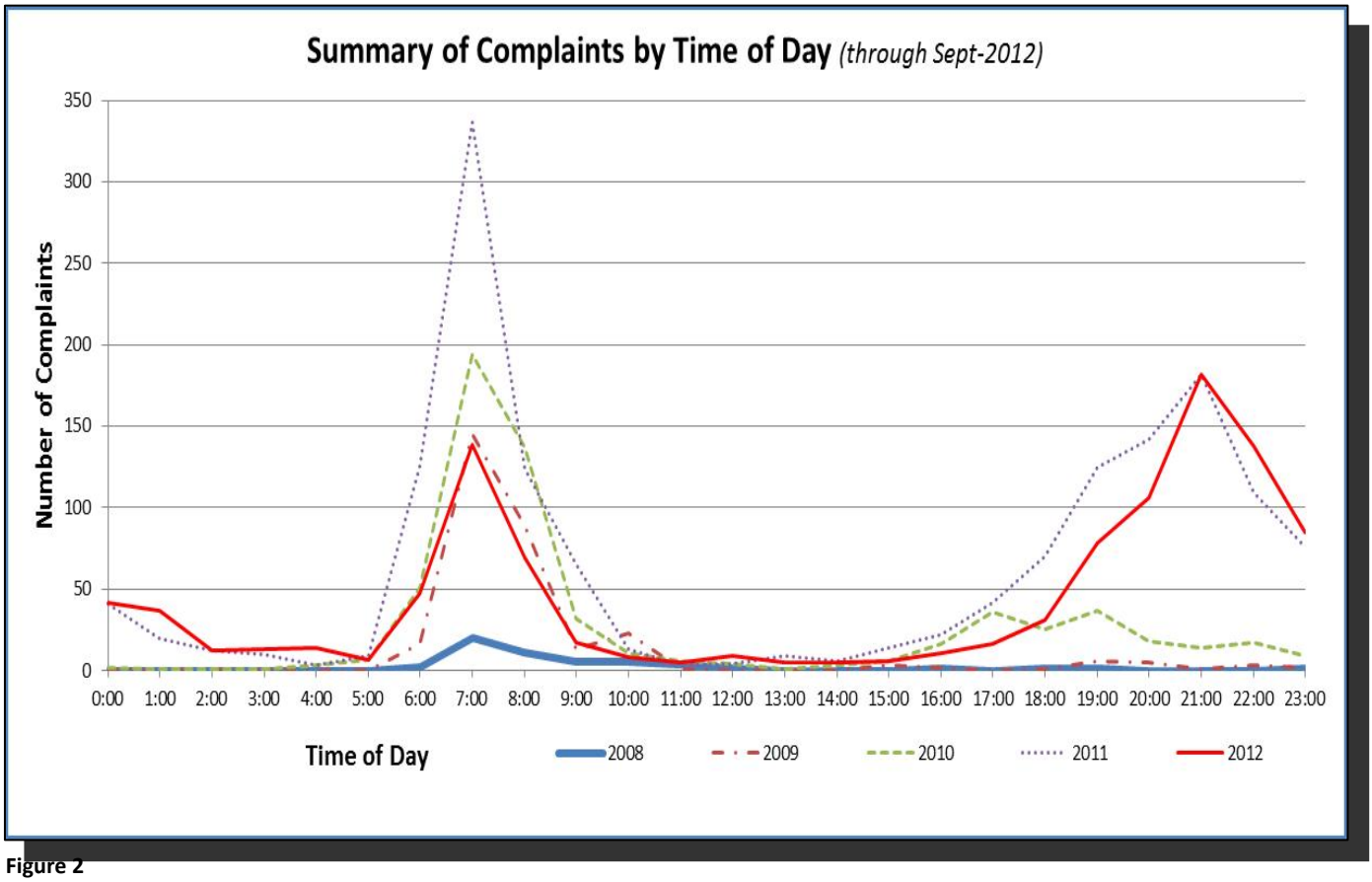

Figure 2

5.1.1 Tarp Removal

In our experience, the peak period of odor production from the working face area when using a geotextile ADC (i.e., a tarp) occurs early in the morning when the tarp is removed to prepare for the site's daily disposal activities. When tarps were still being used at SCL (e.g. prior to September 2010), this activity occurred at approximately 5:30 AM to ready the working face area for opening at 6 AM. A review of the odor complaint data indicates the following:

- The highest 1-hour period of complaints ever recorded occurred during the 7:00 AM hour in 2011 – after the use of ADC was discontinued in 2010 and replaced witha mandatory 9 inches of soil cover. In fact, during the morning hours when it would be expected that the elimination of the use of tarps would result in a decrease in odor complaints, the number of complaints actually increased by 74% in 2011 – compared to the same 1-hour time period in 2010.

The fact that odor complaints did not decrease in the morning hours after the use of tarps was discontinued indicates that the number of odor complaints is not related to the use of tarps at SCL. If discontinuing the use of tarps was related to the number of odor complaints, it would be expected that there would be few, if any, complaints in the morning hours once that practice was discontinued.

5.2. Placement of 9 Inches of Daily Soil Cover

Disposal operations at SCL cease at 6 PM Monday through Friday and at 2 PM on Saturdays. The working face is typically covered by 8 PM at the latest Monday through Friday, and by 4 PM at the latest on Saturdays, unless there are mitigating circumstances (e.g. rain) that delay placement of the 9 inches of soil cover. Based on the (incorrect) assumption that the 9 inches of soil cover would provide a more effective barrier than ADC, for odorous emissions to escape the working face area, it would be expected that there would be a significant decrease in the number of odor complaints once the daily cover operations were fully completed.

An additional consideration is that imperfections in grading, the uneven surface of the waste (i.e., voids), and the wide variation in types of waste make it impossible for any landfill to cover trash with the equivalent of six (6) inches of soil. In our experience at more than 200 landfills, the average landfill in the U.S. uses the equivalent of 16 inches of soil to adequately (and visually) cover compacted waste. The least we have measured is an equivalent of 11 inches of soil – and this occurs only at very efficient landfills, under ideal conditions.

In order to determine the actual depth of compacted soil SCLis using on a daily basis, we asked SCLlandfill operators to conduct a 2-week study. Over this 2-week period, SCL operators measured the area of each day's cell prior to placing cover soil, and also tracked the quantity of soil used for cover by counting scraper loads. The results show that the actual depth of soil used on the active face at SCL,exceeds the required 9 inches with an average depth of 13.1 inches. A daily variation from 10.4 inches to 15.9 inches was measured (See Figure 3).

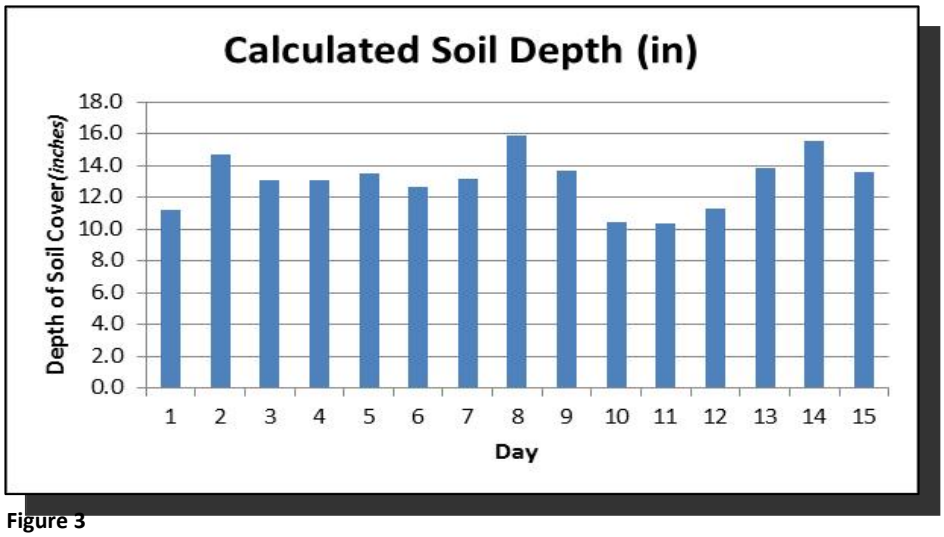

Figure 3

Based on the DPW's theory that 9 inches of compacted soil cover would provide a greater barrier to odor from the working face area, it would be expected that odor complaints would have decreased significantly after the implementation of this practice in September, 2010. This is especially true given that it has been demonstrated that more than 9 inches of daily soil cover is actually being placed. However, this is not the case – a fact which is affirmed by an increasing number of odor complaints made to SCAQMD. A review of the complaint log through September, 2012, indicates the following:

- The number of odor complaints increased during the hours following site closure and placement of daily cover soil in 2011 and 2012;
- The most dramatic and consistent increase in odor complaints has occurred after the landfill has closed for the day (See Figure 4).

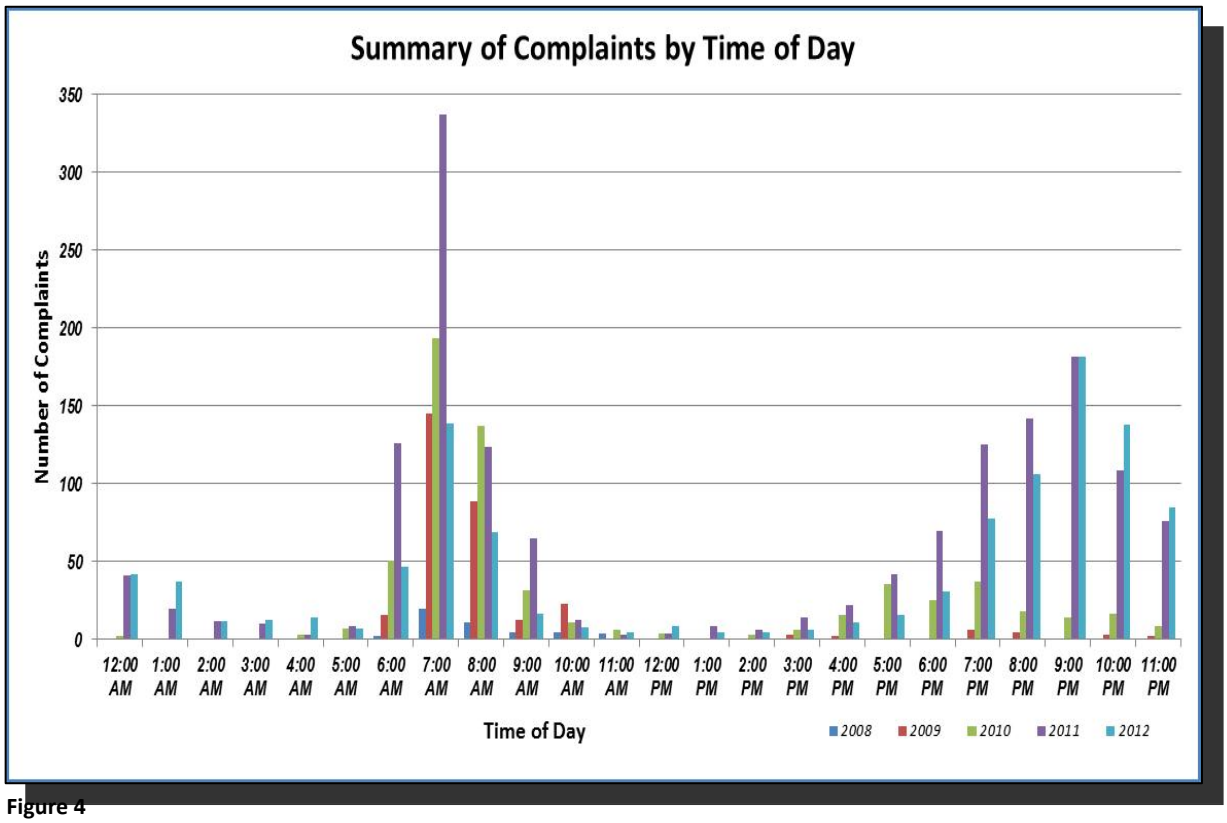

Figure 4

5.3. No Windowing

As required by DPW (Section 1.2.3), SCL is not allowed to remove, or "window", the previously-placed daily cover soil. Trash brought to the site each working day is therefore placed and processed on top of the compacted daily soil – which our recent study indicates averages more than 13 inches thick.

The windowing process typically occurred prior to SCL accepting the first loads of trash at 6:00 AM or shortly thereafter. Since September, 2010, SCL had used tarps for ADC, and the process of windowing was not used except on Monday mornings when the soil cover material placed at the end of the day on Saturday, was removed.

Unfortunately, the decision to prohibit windowing is counter-productive in regard to reducing odors. Based on industry standard practice and knowledge, the requirement tonot remove the daily cover material prior to placing additional waste, may actually result in an increase in odors, because of the limitations it imposes on the landfill's leachate and gas recovery system. This issue has been discussed with DPW and evaluated by other contractors working at SCL.

The negative impacts caused by leaving soil layers within the landfill are widely known within the landfill industry.

The high potential for those intervening soil layers to impede liquid and gas movement is discussed in the EPA Project Summary (The Use of Alternative Materials for Daily Cover at Municipal Solid Waste Landfills, September 1993):

> *"The use of ADCMs (i.e., Alternative Daily Cover Materials) can enhance controlled leachate and gas management by limiting the development of intervening cover layers. Eliminating such layers facilitates unimpeded movement and collection of leachates and gases within and between the landfill cells…."*

The full study (July 1993) states the following:

> *"The barriers created by 6-inches (15 cm) soil layers can impede the vertical movement of leachate and gases within the landfill cells, cause uncertain lateral migration, and thereby promote potential health and environmental problems."*

One of the benefits stated in this study is that the use of ADC can:

> *"Improve opportunities for more effective leachate and gas management by avoiding construction of intervening layers within the landfill that could impede controlled movement and ultimate treatment and disposal."*

A technical paper by John Pacey, Ramin Yazdani and other noted landfill experts specifically addresses this issue.

> *"Low permeability daily cover can create barriers to the effective percolation of leachate and water (Miller et al, 1991). It can also impede leachate distribution and landfill gas flow to collection and distribution systems. Where low permeability soil is used as cover, its ability to serve as a barrier should be reduced by scarifying, or partial removal, prior to placing solid waste over it."*[2]

The practice of removing daily/intermediate soil prior to placing additional waste is industry-wide and is supported not only by regulation, but by industry textbooks as follows:

[2] The Bioreactor Landfill – An Innovation in Solid Waste Management, John Pacey (EMCON), Ramin Yazdani (Yolo County), Debra Reinhart (Univ. of Central Florida), Don Augenstein (IEM), Richard Morck (Engage Environmental).

- The Handbook of Solid Waste Management: , "…When a second lift is to be placed over the first life, the soil is removed and stockpiled before filling begins." [3]

- The Handbook of Landfill Operations: , "…Prior to placing each day's garbage, it is usually best to strip all the available soil from the footprint…"[4]

- CalRecycle ADC Training Workshops: , "Strip (i.e., remove) available soil prior to placing the next cell."[5]

- CalRecycle study (SCS 2008): ,"Because there are many layers of daily cover within a landfill, low permeability daily cover material can actually become a direct impediment to gas collection by preventing adequate vacuum distribution and coverage in the waste."[6]

- Agency for Toxic Substances and Disease Registry (ATSDR), through the Center for Disease Control (CDC): "Upward movement of landfill gas can be inhibited by …landfill cover material (e.g., by daily soil cover…). When upward movement is inhibited, the gas tends to migrate horizontally to other areas within the landfill or to areas outside the landfill…"[7]

- The Solid Waste Association of North America (SWANA) provides landfill manager certification throughout the U.S. Their Manager of Landfill Operations (MOLO) class is the industry standard of knowledge required for safe, efficient and compliant landfill operations. The MOLO text book states that removal of cover soil offers the benefit of, *"…eliminating the potential for lateral movement of leachate, thereby minimizing the risk of leachate seeps on perimeter slopes."*[8]

- U.S. Army Technical Manual: Under the chapter on Gas Control, discusses the importance of eliminating potential barriers within the landfill mass, thereby improving gas flow and improving the performance of the landfill gas collection system. The problem, according to a US Army Technical Manual for Landfill Operation, is that,*"The daily soil cover may inhibit gas movement and interaction, and create pockets of gas which restrict gas collection."*[9]

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[3] Handbook of Solid Waste Management, Frank Kreith*©1994*, Page12.47
[4] The Handbook of Landfill Operations, Neal Bolton, *©1995*, Page 210
[5] CalRecycle – LEA Training – Alternative Daily Cover (http://www.calrecycle.ca.gov/lea/Training/ADC/2003AprJun/Presentation.htm)
[6] Technologies and Management Options for Reducing Greenhouse Gas Emissions from Landfills, SCS Engineers for CalRecycle, 2008, Publication #200-08-001
[7] Agency for Toxic Substances & Disease Registry: Landfill Gas Primer – An Overview for Environmental Health Professionals – Chapter 2 (http://www.atsdr.cdc.gov/hac/landfill/html/ch2.html)
[8] Manager of Landfill Operations (MOLO*) ©2010*, Chapter 10, Page 12
[9] US Army Technical Manual (TM5-814-5), Chapter 3, Page 12

6. Size of Working Face as a Contribution to Odor

In order to further examine the impact of the active face as a potential source of odor, the size of the active face was evaluated using a computerized (EXCEL®) "Optimum Cell Geometry" model. The model receives various input information, with the most important being daily inbound tonnage. It then calculates the geometry (L x W x D) that will result in the least practical surface area with the idea that minimizing surface area of the daily cell will minimize the quantity of soil required to cover it.

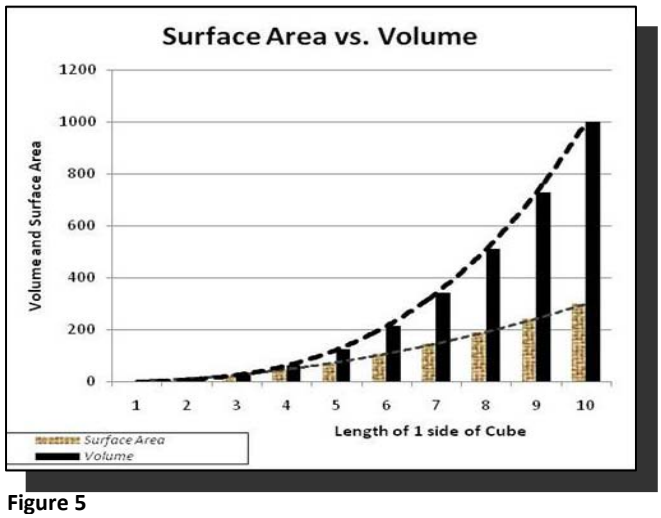


Figure 5

In regard to waste volume vs. face surface area, there is an economy of scale, whereby larger cells (i.e., more tons) are more efficient than smaller (low tonnage) cells. This is due to the geometric principle that surface area is a squared function, and volume is a cubic function. Therefore, as tonnage goes up, the volume will increase at a faster rate than the surface area (See Figure 5).

It is important to understand this concept, in light of the fact that the City and County operations were separate for many years. Consequently, the combined surface area (of the active face) of the two operations was larger than it would have been if the two operations had been combined into one.This is shown in the following chart where the minimum surface area for each operation (each year from 2005-2009) has been calculated – based on annual tonnage (See Figure 6).

As a comparison, the (typical) minimum calculated surface area for the current combined operation (at approximately 8,000 tons per day) is estimated at 36,630 square feet compared to over 50,000 square feet for two separate operations of 4,000 tons per day each.

We have calculated that when the two operations were combined into one (in December, 2009) the total surface area of the active face(s) decreased by nearly 27%. Thus, if the size of the face was a factor in generating odors, there should have been a dramatic decrease in the number of complaints. This did not occur. As shown on Figure 1, aside from some apparently seasonal variation, there has been a continual increase in the number of odor complaints.

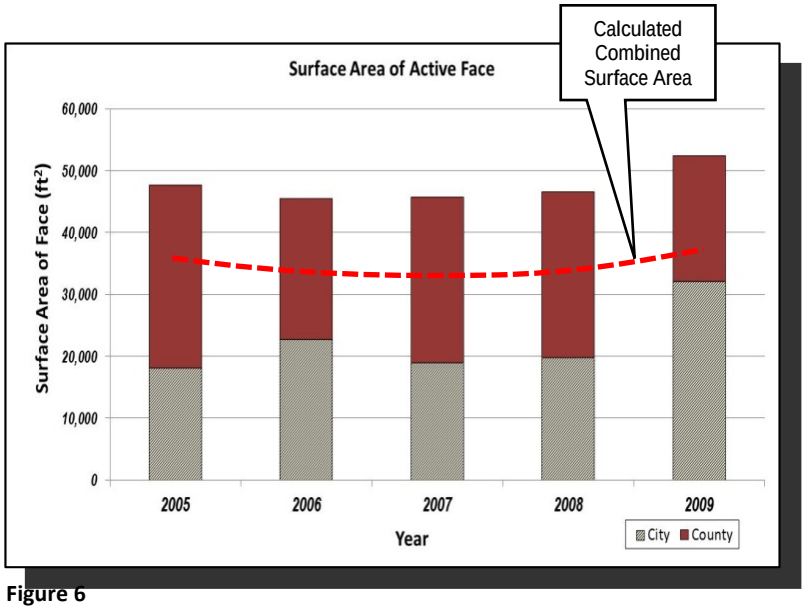


Figure 6

7. Conclusions

In their letter dated September 27, 2010, DPW states the following:

> "Republic's practice (at SCL) of "removing nearly six inches of soil cover on Monday morning and leaving approximately three inches of cover remaining on the working face is inconsistent with established sound engineering practice, and a key contributor factor to the odor conditions. This practice compromises the integrity of the soil cover thereby significantly contributing to an odor nuisance and posing a risk to public health and safety.", and,
>
> "Additionally, Republic's practice of using tarps as daily cover, from Monday through Friday, on the advancing side of the working face deviates from the standard application of compacted soil as daily cover, which has been proven to be effective in controlling odor and other nuisances."

These statements are absolutely not true. DPW's proposed practices have been ineffective at this landfill, as they would be throughout the waste industry.

As discussed in this report, these statements have not proven to be accurate as the odor complaint data evaluated for this report clearly indicates that the use of 9 inches of daily compacted soil cover material is not mitigating off-site odor complaints as intended, and, in fact, odor complaints have continued to increase even though DPW's requirements have been followed since September, 2010.

In addition, the practices mandated by DPW are counter-productive, becauseleaving layers of compacted daily cover soil restricts the proper flow of leachate and gas. As a result, there is not uniform flow of leachate and gas within the landfill – and the leachate and gas collection systems are notable to function at peak efficiency.

Based on a two-week evaluation of the actual depth of soil used at SCL (Section 4.1.2), the excessive use of soil as daily cover material is also in direct contradiction to the site's CUP Condition 23 which requires SCL to maximize the amount of solid waste that can be disposed of at the site by investigating methods to reduce the volume of daily cover requirement.

8. Recommendations

The current mandates requiring SCL to cease the use of ADC, cover with nine (9) inches of soil, and discontinue the practice of removing cover soil prior to placing additional waste – all in an effort to minimize odor originating at the face –are ineffective and should be rescinded immediately.

Based on a consensus of regulatory agencies, landfill experts, studies and accepted industry practice, these ineffective mandates are not helping to control odor but are, in fact, likely to *increase* odor. In order to effectively mitigate the odor issues, it is strongly recommended that future efforts to reduce odor focus on controlling landfill gas, rather than imposing counter-productive limitations on the daily placement/removal of cover soil and ADC.

ATTACHMENT 5

SUNSHINE CANYON LANDFILL
SCL - LEA
LOCAL ENFORCEMENT AGENCY

14747 San Fernando Road
Sylmar, California 91324

Date: June 27, 2013

To: Sunshine Canyon Landfill Board of Directors

From: Wayne Tsuda, SCL LEA Program Manager

Subject: Report Transmittal – Interagency Task Force Sunshine Canyon Landfill Odor Mitigation Program Recommendations

The Interagency Task Force has completed its recommendations for odor mitigation and I have attached a copy for your review. The primary agencies involved on the Task Force included:

The South Coast Air Quality Management District (Chair)

The Sunshine Canyon Landfill Local Enforcement Agency

The Los Angeles County Department of Public Works

The Los Angeles County Public Health Department, Environmental Services Solid Waste Program

The Los Angeles County Department of Regional Planning

The Los Angeles City Planning Department

Attendees also included legal counsel for the agencies above and the SCL LEA Environmental Consultant, Eugene Tseng and Associates.

The recommendations are intended to provide agencies with recommendations for odor mitigation that may be used in each agency's respective areas of expertise for seeking compliance and enforcement, if applicable.

Attachment

Wayne Tsuda
SCL – LEA Program Manager
Office: (213) 252-3932 Cell: (213) 359-4568
Email: wayne.tsuda@lacity.org
For reply: 3550 Wilshire Blvd. 18th Floor, Los Angeles, CA 90010

Date: June 24, 2013

To: Sunshine Canyon Landfill Interagency Task Force on Community Odor Mitigation

Mr. Mohsen Nazemi, Deputy Executive Officer
South Coast Air Quality Management District

Ms. Cindy Chen, LEA Program Manager
Chief, Solid Waste Management Program
Los Angeles County Public Health Department, Environmental Services Solid Waste Program

Ms. Ly Lam, Senior Management Analyst,
Mr. Nick Hendricks, City Planner
Los Angeles City Planning Department

Ms. Maria Masis, Supervising Regional Planner
Los Angeles County Department of Regional Planning

Ms. Emiko Thompson, Senior Civil Engineer
Los Angeles County Department of Public Works

From: Wayne Tsuda, Program Manager
Sunshine Canyon Landfill Local Enforcement Agency

Subject: Sunshine Canyon Landfill Odor Mitigation Program Recommendations

The Sunshine Canyon Landfill Interagency Task Force (Task Force) has been researching and evaluating best management practices to mitigate odors at the Landfill. This has resulted in a compilation of additional operational and programmatic recommendations to supplement the ongoing odor reduction efforts currently in place at the Landfill.

The recommended measures would be implemented in phases by the respective agencies within their areas of purview and authority, as they determine appropriate. Upon their implementation, monitoring of the measures would also be the responsibilities of the respective agencies. If odors persist, further mitigation measures are to be implemented until the odor problem is fully mitigated.

These recommendations have been developed collectively by the members of the Interagency Task Force comprised of the following agencies:

- South Coast Air Quality Management District, Task Force Chair
- Sunshine Canyon Landfill Local Enforcement Agency
- Los Angeles County Department of Public Works
- Los Angeles City Planning Department
- Los Angeles County Department of Regional Planning
- Los Angeles County Department of Public Health
- E. Tseng and Associates, Consultant to SCL LEA

Sources and Types of Odors

There are two identifiable types of odors: 1) fresh trash smells, and 2) odors associated with landfill gas generated from older decomposing trash. Landfill gas is the carrier mechanism of the odiferous compounds generated by the decomposition of the solid waste. Odor types can generally be characterized as fresh trash smells, landfill gas odors, and/or a combination of the above. Sources of fresh trash odors and odors associated with landfill gas may be attributable to any one or combination of the following potential sources:

1. Odors from vehicles delivering trash for disposal;

2. Odors associated with any litter and/or liquids that may fall from the vehicles delivering trash for disposal;

3. Odors from vehicles that are waiting in queue to dump;

4. Odors from the trash truck unloading process at the tipping face area;

5. Odors from fresh trash on the working face before it is covered;

6. Odors from the trash/litter carried into the neighborhood by winds;

7. Trash odors carried by landfill gas which pass through the fresh trash that has been disposed and/or placed upon the working face during operational hours;

8. Fresh trash odors carried by landfill gas through the daily cover; the odor that passes, during closed hours, through the fresh trash that has been disposed and/or placed upon the working face and daily cover;

9. Odors may be carried into the neighborhood via the water spray used to mitigate the odors as odorous compounds attaching themselves to heavier droplets of water as opposed to odorous compounds that otherwise may be dispersed;

10. Odors from "older" decomposing trash that are not captured by the landfill gas collection system;

11. Odors which result from operational activities associated with landfill repair and maintenance such as landfill gas (LFG) collection well installation, trenching, well repair, equipment breakdowns, and shutdowns, etc.;

12. Other odors are occasionally present and may contribute to complaints reported from the community. These include sources such as leachate collection and treatment system, portable toilets, naturally occurring sources associated with the adjacent oil field and from decomposition of plants that are part of the natural habitat areas and/or from plants that have not taken root on the intermediate (and other) cover areas, or odor sources in the community such as manure from horse properties and curbside trash collection.

Source Materials

The primary "source materials" of the odors are from non-hazardous municipal solid waste (MSW), particularly components that are readily decomposable and putrescible materials, such as food waste from homes and restaurants, etc. and from materials that decompose over time to form odiferous compounds within the landfill. Greenwaste (e.g., cut grass) can be odiferous if the grass has been decomposing for a week prior to pickup and disposal at the landfill. Regulated wastes which have been treated (e.g., autoclaved regulated medical waste) are defined as non-hazardous MSW and can be particularly odiferous. The sources of MSW are from residences, businesses, government, schools, industry, and institutions.

Analysis of Odor Complaints and Violations

Since 2008, complaints received by SCAQMD alleging odors from the landfill have substantially increased. These complaints are investigated by SCAQMD field staff and those verified resulted in notices of violation. Other actions taken by the SCAQMD include citations for permit conditions and surface emission exceedances.

The "fresh trash" odor complaints generally occurred during daytime hours (6 AM to 6 PM) and account for approximately a quarter of all verified odor complaints for which the Landfill has been alleged as the source of those odors. Based on SCAQMD's data, potential sources of "fresh trash" odors include:

- transportation of odorous trash through the community;
- the queuing of trucks near or at the landfill and;
- the depositing of odorous trash at the working face during landfill operations. On Mondays or after holidays there may be higher numbers of odor complaints due to the decomposition of trash that has been collected and kept for longer periods prior to disposal.

Calls to SCAQMD during the evening hours (6 PM to 6 PM) were primarily attributable to landfill gas odors which accounted for approximately two-thirds of the verified complaints, based on AQMD's 2012 data. Odors from landfill gas can be caused by the release of gas from the landfill that is not captured by the existing landfill gas collection system. A significant number of complaints attributed to landfill gas releases is suspected to be associated with the following sources:

- a landfill gas collection and flare system that is undersized for the amount of gas being produced and that has experienced frequent shutdowns due to new equipment installation, equipment breakdowns, and equipment maintenance activities;
- landfill gas collection well installation procedures which allow the release of significant amounts of landfill gases;
- soil surfaces that have fissures, crevices or where erosion has occurred creating pathways for landfill gas to escape; and
- local weather patterns affecting wind direction and intensity

Holistic Approach to Odor Mitigation Options

The Task Force has determined that the optimal approach to mitigate odors emanating from Sunshine Canyon Landfill would require the implementation of measures to manage the sources of both fresh trash odors and landfill gas odors through best available technology and best management practices.

The optimal approach requires focusing on the best combination of practical preventative programs, facility design features, operational practices, maintenance protocol, and odor mitigation programs that provide the optimal operating conditions of the landfill gas collection system.

Based on this approach, the Task Force has determined that the highest priority for reducing complaints related to landfill gas is to:

- optimize the operation of the landfill gas collection system for maximum effectiveness based on accurate information on existing conditions;
- to assure that the landfill gas collection system is properly constructed and operated at the design criteria; and
- the landfill gas collection system be properly maintained and capable of sustaining temporary emergencies, such as power outages or extreme weather conditions.

Recommendations:

The Task Force has reviewed the various listed odor mitigation measures and recommends the following steps be taken immediately:

Operational Changes

- Require odor control operators with portable mobile sprayers containing odor neutralizer to apply the neutralizers on the waste for specific loads at the working face on a specific load-by-load basis. For loads that are identified as odiferous loads such as treated medical waste or putrefied food, the portable/mobile sprayer and operator must be situated at the tipping location so that the odor neutralizer can be used during the truck unloading operation.

- Require treated medical wastes to be prioritized for immediate burial at the working face.

- All areas of intermediate cover (minimum of 12 inches of compacted soil) must be maintained to prevent the emission of landfill gas through the cover surface.

- Require that an additional vegetative layer (with plants and soil with compost mix) be placed on top of intermediate cover areas, which would also act as a biofilter layer for emissions that may be venting through the cover. Surface emissions must be continually monitored, including areas with established vegetative covers to ensure that the underlying intermediate cover does not develop cracks and seeps.

- Intermediate cover areas with surface emissions beyond regulatory limits must be repaired within regulatory time limits or sooner if possible. Should surface emissions of LFG continue to be released in quantities above the allowable SCAQMD thresholds from intermediate cover areas after completing the landfill gas collection system upgrades, the following may be required:
    a. Install new landfill gas collection wells as directed by SCAQMD. Other methodologies may be employed such as, but not limited to:
    b. A thicker intermediate soil cover or the use of a more impermeable material such as clay may be specified;
    c. The use of a synthetic impermeable removable non-porous geosynthetic liner on top of the intermediate soil cover (e.g., Closure Turf or equivalent) that is anchored and connected to the landfill gas collection system
    d. Should intermediate cover methodologies fail or prove to be infeasible, intermediate covers shall be upgraded to meet final closure standards if surface emissions on intermediate cover areas persist.

- Require the Landfill Operator to maintain an ongoing program of identification, monitoring, upgrading/repairing and replacing non-performing wells, and provide monthly reports to the SCAQMD for distribution to the Task Force.

- Consider allowing the peeling back of the daily soil cover that was applied the previous day under prescribed conditions which may include:

a. to be in conjunction with the proper design, construction, and maintenance of the landfill gas collection system
b. to be allowed only Tuesday through Friday;
c. approximately three to six inches of soil cover to remain in place;
d. soil to be removed in stages to match the need for tipping, disposal and compaction; and
e. after ceasing filling operations on Saturday, a full 9-inch cover is to be placed and remain in place on Mondays.

- Landfill Operator shall submit and implement a plan for using a negative air pressure system to prevent landfill gas from escaping into the atmosphere during gas collection well installations and trenching activities, and from the excavated refuse material.

- Require the Landfill Operator to continuously evaluate the effectiveness of current maintenance procedures including the adequacy of gas well tuning and balancing frequencies, and the efficiencies of the flares and gas wells. The Landfill Operator must also routinely fine tune, maintain, and repair gas wells.

- Shutting down flares and taking the gas collection system off-line for maintenance purposes during adverse wind conditions should be prohibited.

- Monitor the progress of the Landfill Operator to expedite the installation of back-up generators to ensure the continuous operation of all flares in the event of a power failure at the site.

- Consider a pilot project for the Landfill Operator to demonstrate the effective use of a biodegradable or thermodegradable plastic approved as Alternative Daily Cover (ADC) or combinations of ADCs which meets the statutory performance standards that apply.

<u>Actions Related to Overall Facility Design</u>

- Require the Landfill Operator to determine the actual in-place waste density and revise the vertical and horizontal landfill gas well spacing to reflect actual conditions at the site, including cover requirements. The Operator must also reevaluate the existing landfill gas collection system design and expedite installation of new and replacement wells to achieve desired "well density" according to the findings. Additional field analysis such as horizontal and vertical gas permeability analysis (and resulting permeability ratio data) should be used to evaluate the actual radius of influence which should be used to determine the overall landfill gas collection efficiency. The Information used in calculating the radius of influence and designing the landfill gas system shall be shared with Task Force members for their review and concurrence.

- Require the Landfill Operator to plant trees for the purpose of creating a vertical physical barrier. A planted wall shall also be used to mount a misting system to control odors in appropriate locations. Strategically placed orchard fans should be incorporated to create as much dispersion of the funneled air flow out of the entrance of the landfill.

- Require the Landfill Operator to review and revise cell design, sequencing, and fill operations and apply the revised design in all new cell construction in order to minimize the slope angle of daily and the steeper intermediate slopes, which will allow for better compaction of the daily and intermediate soil cover. Cell design, sequencing, and fill operations should consider minimizing the surface area of steeper intermediate slopes in future cell development of the landfill.

- Require the Landfill Operator to explore new industry standards, best management practices and emerging technologies to supplement odor reduction efforts at the landfill and cooperate with Task Force member agencies to implement pilot projects where feasible such as electronically reporting the monitoring and corrective actions on a monthly basis.

<u>Verification of the Effectiveness of Various Odor Mitigation Measures</u>

- Require the Landfill Operator to recalculate the LFG collection system efficiency each at the beginning of each calendar year to take into account the additional landfill gas being generated by the increase in the overall in-place disposal tonnage of the preceding calendar year. The data and the methodology utilized in the calculation of the LFG collection system efficiency shall be provided to the SCAQMD for distribution and review by the Task Force members.

- Require the Landfill Operator to measure the in-place density of trash in the areas with the 9 inch daily soil cover with a Gamma Density Logger for the purpose of calculating the radius of influence. Both the density of the refuse at different depths and the density of the daily cover shall be measured. If the radius of influence is determined to be less than ideal, additional landfill gas extraction wells should be required (unless increasing the vacuum can increase the radius of influence without intrusion of atmospheric oxygen).

- As a supplement to the required ongoing surface emissions monitoring, the Landfill Operator may be required to conduct a research project as part of which a large sheet of synthetic, impermeable material is to be installed on selected locations of intermediate cover to determine any landfill gas emissions through intermediate cover.

As these proposed measures, through its collective implementation, are intended to mitigate odors at the Sunshine Canyon Landfill, agencies should monitor the effectiveness of these measures within their respective areas of purview. Based on the

findings of such monitoring the mitigation measures may be modified, added, or discontinued accordingly, until the odors at the landfill are mitigated.

Documents reviewed include studies and other documents prepared by Republic, its consultants, South Coast Air Quality Management District and related correspondence. Technical references and documents that were reviewed are available in electronic format upon request from the SCL LEA. Other documents that were utilized are posted on the SCL LEA web site www.scllea.org in the "Special Projects" page and can be downloaded from the "Attachments" section at the bottom of the Special Projects page.

Attachment

ATTACHMENT 1
Technical Comments

The following notes are provided as background for the recommendations provided. Please note that the Task Force will continue its research into best management practices for odor mitigation at Sunshine Canyon Landfill (Landfill).

Improving LFG Collection Efficiency

The Task Force recognizes that proper design, operation, and maintenance of a LFG collection system is needed in achieving a high collection efficiency of the LFG gas and thus controlling odors associated with landfill gases. Landfill gas collection systems for operating landfills do not operate at 100% collection efficiency for the total amount of landfill gas that is generated. The danger of oxygen intrusion and the potential for subsurface oxidation (underground fires) have to be avoided therefore, the landfill gas collection system design and operations is a constant balance of trying to collect the largest volume of landfill gas generated without creating overdraw in which atmospheric oxygen is drawn through the surface or other potential paths into the collection system.

While LFG control systems do not operate at 100% collection efficiency, the Task Force recommends that the design capacity for the LFG collection system should be sized for 100% collection efficiency for the maximum rate of LFG generation volume that is anticipated to be produced during the life cycle of the landfill, rather than a default 75% average value, or even the upper end, 85% of the range value. The Task Force believes it would be prudent to have a safety factor to accommodate periods in which the rate of landfill gas generation may be increased beyond the "average" rate of generation.

Methodologies for Calculating Landfill Gas Collection Efficiency

There are many methods of computing "collection efficiency" depending upon how the method is utilized for the calculation of the total volume of landfill gas generated. For this report we have reviewed the US EPA's AP-42 (Federal Emissions Standards) as referenced by the Landfill operator in their evaluation of their landfill gas collection system.

The United States Environmental Protection Agency (US EPA) document, AP- 42, states that a 75% LFG collection efficiency as a "typical value", but typically reported a range of values from 60% to 85%. Puente Hills, one of the Los Angeles County Sanitation District's (LACSD) active landfills, is currently achieving 95%+ LFG collection efficiency. The LACSD utilizes a different methodology from the US EPA called the Integrated Surface Methane (ISM) Industrial Source Complex (ISC) air dispersion model to estimate LFG collection efficiencies of their landfills.

In the Integrated Surface Methane/Industrial Source Complex method, LACSD defines collection efficiency as:

Collection Efficiency = Collection / (Collection + Emission)

Whereas, US EPA AP-42, the LandGEM model utilized by both the Landfill operator and SCAQMD, defined collection efficiency as:

Collection Efficiency = Collection / Generation

where generation is simulated using the LandGEM model. In an ideal situation, the collection efficiencies would be the same under both methods.

The Task Force cautions those looking at landfill gas collection efficiency to be aware of the two methodologies and possible differences in stated results.

Current Status of Landfill Gas Collection System Efficiency

Whatever the potential strengths and weaknesses and/or differences in the calculated "collection efficiency", since the initial Task Force meeting of regulatory agencies in the summer of 2011, the Task Force has maintained that most of the reported landfill odors (occurring during closed hours) are resulting from an inadequate landfill gas system (overall capacity and the associated gas collection well / piping system). The Task Force has reviewed documents received from the Landfill operator regarding the evaluation of the landfill gas collection system ("Evaluation of the Existing Landfill Gas Collection and Control System, Sunshine Canyon Landfill", prepared by Bryan A. Stirrat, dated November 29, 2011).

The Task Force notes that as of January 2013, significant improvements have been made by the Landfill operator to the landfill gas collection system as the result of the SCAQMD' Stipulated Orders of Abatement and by the Landfill operator voluntarily, and that the collection capacity is much more capable than it was in 2011 or 2012.

Landfill operations have significantly changed over the years and so has the solid waste composition. With the passage of AB 939 (Sher - Integrated Waste Management Act of 1989), the composition of municipal solid waste has changed significantly. In the past when the in-place landfill trash densities were much lower in value than those achievable in today's operating practices (1,900+ pounds per cubic yard), a six inch daily soil cover, although a discrete layer when applied, would eventually be indistinguishable with the solid waste because the soil would disperse and move into the interstitial volume and just become part of the overall solid waste mass. This can be observed in borings taken from old landfill; no distinct "daily soil cover" layer is observable.

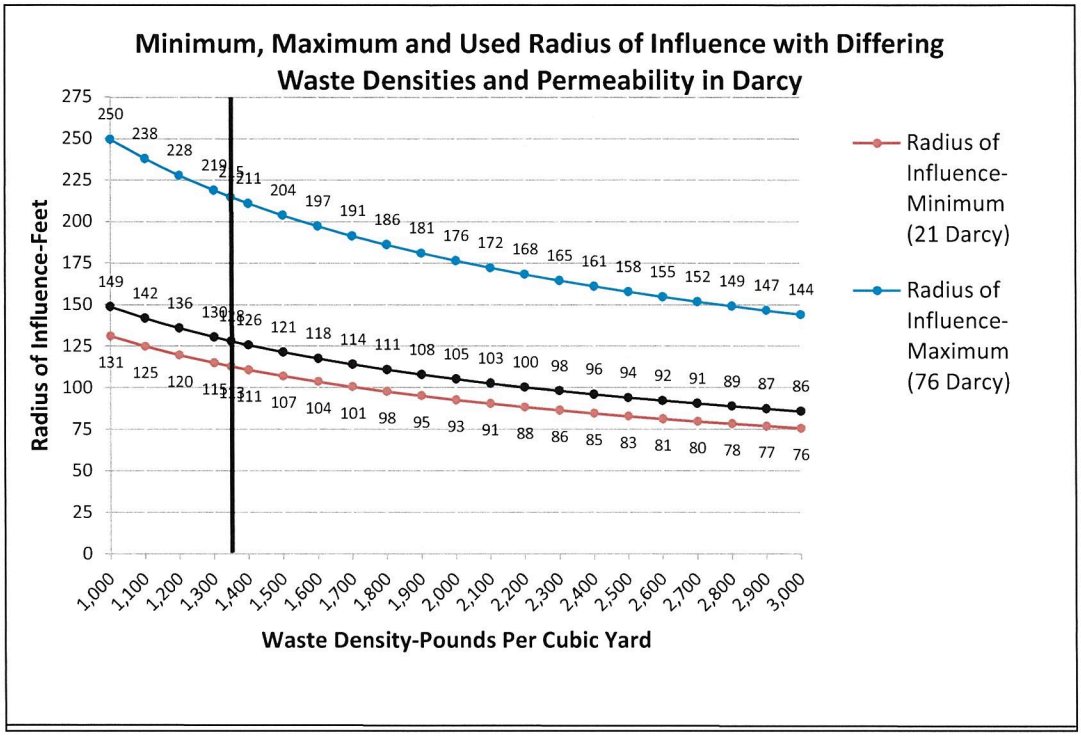
The Task Force believes that using the concept of intrinsic permeability, one can generally correlate flows of water to flows of landfill gas and therefore to the flow of odors (e.g., odorous compounds carried by landfill gases). Intrinsic permeability is a characteristic of any porous medium and entirely independent of the nature of the fluid – whether gas or liquid. Simplifying from Darcy's Law for water and gas flow through a permeable medium and solving for the intrinsic permeability coefficient in common, and thus one can calculate volumetric flow of landfill (higher density, less permeability, more soil, higher density, equals less permeability).

Radius of Influence of Gas Collection Wells

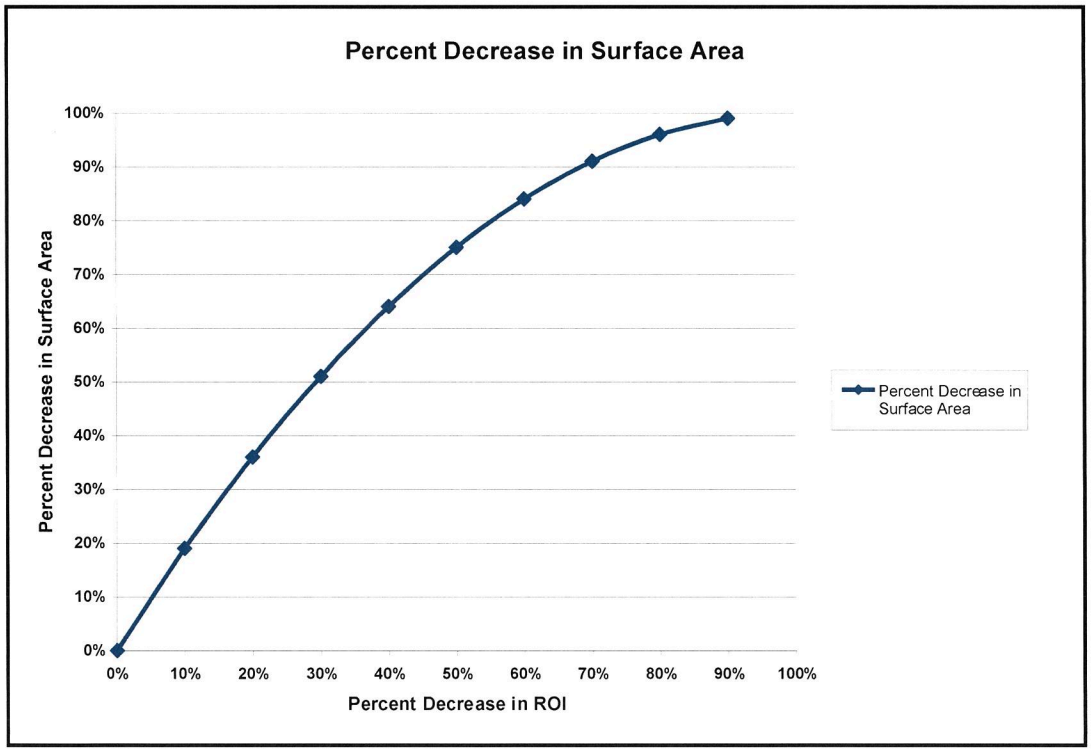
A primary issue discussed between the Task Force members dealt with the radius of influence needed for effective collection of the generated landfill gases and the overall collection efficiency needed for the control of odors. One of the key factors in the design of a landfill gas collection system is the determination of the needed well spacing. One of most important factors is the density of the in-place mass. The initial density used by the Landfill operator's consultant, Bryan A. Stirrat (BAS) for the calculation of the radius of influence was 1,350 pounds per cubic yard (assumption used in calculation). The SCL LEA's opinion is that this value is too low, which would result in a radius of influence that this greater and thus a less dense well location density needed for achieving a specific landfill gas collection efficiency.

The radius of influence is important due to the volume of gas being collected; if using the volume of a cylinder as the theoretical volume of the effective vacuum, the volume is proportional to the square of the radius, so that a 10% decrease in the radius of influence results in an impact of 20% of the volume (or surface area of the circle) from which the landfill gas collection well draws from.

Below are several graphs that illustrate the relationship between density and radius of influence. The SCL LEA's consultant calculated the approximate radius of influence as a function of density, with a range (minimum / maximum) with different permeability values.



Source: E.Tseng and Associates, Feb. 2013



Source: E.Tseng and Associates, Feb. 2013

The estimated in place density of trash (in the areas where the 9 inch daily soil has been a requirement) by doing a rough calculation based on data supplied by the Landfill operator.

Data used in the density calculation:

- Days between flyovers from 2/28/11 and 2/10/12 = 347
- Tonnage of waste received at the gate and buried between flyover dates is 2,301,010 tons
- Total weight of 9" soil cover approximated at 896,000 cubic yards at 105 pounds per cubic foot is 1,270,080 tons
- Volume of consumed airspace between flyover dates = 3,133,472 cubic yards
- Add 1,272,080 tons to 2,301,010 tons for total weight of materials in the 3,133,472 cubic yards volume

The actual density of the materials (combined solid waste and daily/intermediate cover) that should be used as the density factor for the calculation of the radius of influence is approximately 2,269 pounds per cubic yard. The density of the solid waste (by itself) at Sunshine is calculated to be approximately 2,056 pounds per cubic yard. According to the Los Angeles County Sanitation Districts (LACSD), the average density of the in-place trash only (called LF waste density) for PHLF is about 1,960 lbs/yd^3. Puente Hills Landfill uses a 50:50 mix of shredded greenwaste with clean soil as daily cover, and the average density of in-place trash and daily/intermediate covers (airspace utilization density) for Puente Hills Landfill is 1,405 lbs/yd^3.

Also, as previously stated, the waste composition has significantly changed compared to the development of the US EPA AP - 42 standards. Municipal solid waste has more moisture content, is denser, and the initial landfill gas generation will occur quicker and produce greater volumes that municipal waste from the pre-AB 939 implementation. In recognition of this change, the Landfill operator utilized a more recent composition of the municipal waste stream in its calculation of the landfill gas generation. As of December 2012, the Landfill operator's consultant BAS, is now utilizing approximately 1,700 pounds per cubic yard for calculating the radius of influence (ROI) of landfill gas wells. If the estimated density of 2,269 pounds per cubic yard is used for the ROI calculations, the ROI will decrease to less than 100 feet, and when combined with an "overlap" of 30% - 40%, the needed well spacing will be significantly lower than the approximate 200 feet being utilized in the current design.

The general design spacing of the vertical gas collection wells at the Puente Hills Landfill calls for 150 – 200 feet spacing, with 200 feet being typical. Note that at Puente Hills Landfill, the landfill gas well spacing is similar to the design standard of that of Sunshine Canyon Landfill. The big difference is that the density of the mixed greenwaste and soil combination daily cover is much lower than that of the solid waste being disposed, which creates the increased permeability needed for landfill gas movement needed for optimum gas extraction and to promote downward flow of leachate.

BAS has indicated that there are limited well depths to 120 ft. in their designs for cell CC2 and that the density for 0-120 ft. is less than the average for 0-250 ft. depth (the max depth of cell CC2 refuse). BAS notes that the gas of most significance is that within the slotted depth of gas extraction well. However, landfill gas is being generated at all depths including depths beyond the slotted collection pipes. If there is no extraction vacuum, landfill gas pressure will build and eventually migrate to the ground surface and be released, where it is not collected.

Note that even if a daily soil cover of six inches instead of the current nine inches were used, the estimated density would decrease to approximately 2,221 pounds per cubic yard, and the resultant change in the radius of influence is a decrease of approximately two feet. In the literature review, both the SWANA MOLO course materials and also the CalRecycle training materials on landfill gas and/or leachate management recommend using alternative daily covers to promote leachate movement downward and to promote landfill gas collection (in recognition of the soil layer's ability to become an impediment to landfill gas movement and leachate flow.

As previously noted, the landfill gas collection system should be designed for 100% collection efficiency with a safety factor to deal with extraordinary gas generation (e.g., increased generation after wet weather). Even with the implementation of the landfill gas-to-energy project, the collection capacity should still be based on the volume of 100% landfill gas generation.

<u>Considerations with Regard to the Daily Soil Cover Requirement</u>

The Los Angeles County Conditional Use Permit (No. 00-194-(5)) under Item 45(N) can require Republic to implement additional corrective measures, in this case 9 inches of daily soil cover, when such measures are deemed necessary. The Task Force has received information that the use of 9 inches of daily cover soil, while effective at reducing fresh trash odors at the working face of the landfill, may slow down the vertical movement of leachate and gases across the landfill cells. Peeling back a portion of the 9 inch daily soil cover under prescribed conditions is an option being considered in combination with other odor mitigation measures to potentially enhance the efficiency of the gas collection system.

Summary

To summarize the Task Force's analysis, the highest priority and the most significant impact to reducing the odors related to landfill gas is to ensure the continued implementation of a well-designed, operated, and maintained landfill gas collection system. The optimal approach would focus on the best combination of facility design features, operational practices, practical preventative programs, daily and intermediate cover requirements, and odor mitigation programs that provide the optimal operating conditions of the gas collection system, to effectively collect the landfill gas that is generated and minimize unintentional releases of landfill gas.

At the same time, programs should also be implemented to mitigate the offsite migration of fresh trash odors in addition to measuring, verifying and documenting quantifiable environmental metrics utilized to benchmark and measure progress in the mitigation of odors.

ATTACHMENT 6

EPI Environmental Products Inc.
Unit 207, 102 Grover Street
Lynden, WA 98264
U.S.A.
Tel: +1 (604) 738-6281
Fax: +1 (604) 856-8189
Email: envirocover@epi-global.com
Website: www.envirocoversystem.com

August 5th, 2014

To: Customers of Enviro™ Cover System in the USA

Dear Sir/Madam,

Re: Environmental Claims Relating to Enviro™ Cover System In the United States of America

We need to bring to your attention that as a result of being advised under the California Public Resources Code section 42357 and a further review of "16 CFR Part 260 Guides for the Use of Environmental Marketing Claims" published by the Federal Trade Commission (FTC) on October 11, 2012, we are unable to continue making environmental claims that the Enviro™ Cover System in the United States of America is "biodegradable", "degradable", or "decomposable", etc.

The FTC Guides state that "*marketers should not make unqualified degradable claims for items destined for landfills, incinerators, or recycling facilities because complete decomposition in those specific environments will not occur within one year.*"

The California Code states that "*except as provided in subdivision (a), a person shall not sell a plastic product in this state that is labeled with the term "biodegradable," "degradable," or "decomposable," or any form of those terms, or in any way imply that the plastic product will break down, fragment, biodegrade, or decompose in a landfill or other environment.*" Currently, the California Code only permits the sale of a plastic product that meets the relevant standard relating to the term "compostable", "home compostable", or "marine degradable".

Although EPI has scientific data on the degradation of Enviro™ Cover film in a landfill and has sold Enviro™ Cover to customers in the past 15 years without issue, Enviro™ Cover does not degrade quickly enough in a landfill to meet these requirements of the FTC Guides and the California Code.

As a result and for the US market, we have elected to remove the environmental claims relating to Enviro™ Cover in a landfill and the labelling of Enviro™ Cover with the term "degradable".

Notwithstanding the above Enviro™ Cover is still a nonreusable geosynthetic alternative daily cover (ASTM D6523 – 00) and will continue to be marketed as such.

Should you have any questions on the above matter, please do not hesitate to contact us directly.

Yours sincerely,

Reg Allen, P.Eng
Vice President
EPI Environmental Products Inc. (DE)

ENVIRO™ COVER SYSTEM

ATTACHMENT 7

Enviro™ Cover Technical Specifications

1. Physical Form

Degradable polyethylene film

2. Film Dimensions

Table 1 Standard Dimensions and Weight

Model	Thickness in. (mm)	Width in. (cm)	Length ft (m)	Area ft^2 (m^2)	Film Weight lb (kg)
1.25 mil x 10 ft *(32 micron x 3.0 m)*	0.00125 *(0.032)*	111.5 *(283)*	7,560 *(2,304)*	70,245 *(6,525)*	422 *(192)*
1.25 mil x 16 ft *(32 micron x 4.88 m)*	0.00125 *(0.032)*	190 *(483)*	7,560 *(2,304)*	119,700 *(11,119)*	720 *(327)*
1.25 mil x 18 ft *(32 micron x 5.5 m)*	0.00125 *(0.032)*	214 *(544)*	7,560 *(2,304)*	134,820 (12,524)	810 (368)
1.75 mil x 16 ft *(45 micron x 4.88 m)*	0.00175 *(0.045)*	190 *(483)*	5,250 *(1,600)*	83,000 *(7,710)*	698 *(317)*
1.75 mil x 18 ft *(45 micron x 5.5 m)*	0.00175 *(0.045)*	214 *(544)*	5,250 *(1,600)*	93,500 *(8,686)*	786 *(357)*
2 mil x 16 ft (51 micron x 4.88 m)	0.002 (0.051)	190 *(483)*	5,250 *(1,600)*	83,000 *(7,710)*	800 *(364)*
2 mil x 18 ft *(51 micron x 5.5 m)*	0.002 *(0.051)*	214 *(544)*	5,250 *(1,600)*	93,500 *(8,686)*	900 *(409)*
5 mil x 16 ft 127 micron x 4.88 m)	0.005 (0.127)	190 (483)	2,100 (640)	33,000 (3,065)	800 (364)
5 mil x 18 ft *(127 micron x 5.5 m)*	0.005 *(0.127)*	214 *(544)*	2,100 *(640)*	37,150 *(3,451)*	900 *(409)*

Note: The tolerance for film thickness and film weight is +/- 10% of the specified values.

3. Properties

Table 2 Standard Color

Type	Opacity	Colour
Daily Cover	Opaque	Brown
Extended Daily Cover	Opaque	Buff
Intermediate Cover	Opaque	Brown

Table 3 Minimum Elongation

Model	Minimum Elongation (%)
1.25 mil x 10 ft	350
1.25 mil x 16 ft	350
1.25 mil x 18 ft	350
1.75 mil x 16 ft	400
1.75 mil x 18 ft	400
2 mil x 16 ft	500
2 mil x 18 ft	500
5 mil x 16 ft	700
5 mil x 18 ft	700

4. Packaging

4.1. Enviro™ Cover is packaged in rolls with a core. The core has a minimum inside diameter of 6 inches (150 mm) and a minimum thickness of 0.45 inch (12 mm).

4.2. Each roll has a serial number, which is marked on a label along with the information on film weight and film length.

4.3. Rolls are sealed tightly with a 20 mil white polyethylene (or equivalent) and shrink wrapped to exclude air and sunlight. An outer polyethylene sleeve is pulled onto the roll with both ends sealed.

4.4. The length, diameter and gross weight of the rolls are shown in Table 4.

Table 4 Standard Dimensions and Gross Weight

Model	Roll Length in. (cm)	Roll Diameter in. (cm)	Gross Weight lb (kg)
1.25 mil x 10 ft	113.5 (288)	14.5 (37)	450 *(205)*
1.25 mil x 16 ft	191 (485)	14.5 (37)	770 *(350)*
1.25 mil x 18 ft	215 (546)	14.5 (37)	870 (395)
1.75 mil x 16 ft	191 (485)	14 (36)	750 *(341)*
1.75 mil x 18 ft	215 (546)	14 (36)	846 *(385)*
2 mil x 16 ft	191 (485)	15 (38)	850 *(386)*
2 mil x 18 ft	215 (546)	15 (38)	950 *(432)*
5 mil x 16 ft	191 (485)	16 (41)	850 (386)
5 mil x 18 ft	215 (546)	16 (41)	950 *(432)*

5. Storage Period and Average Cover Duration

5.1. Enviro™ Cover storage period and average cover duration shown in Table 6, are subject to proper storage conditions recommended by EPI. The average cover duration will vary with the seasons and with the regions, subject to mechanical stress, UV and heat exposure.

Table 6 Storage Period and Average Cover Duration

Type	Model	Storage Period	Average Cover Duration
Daily Cover	**1.25 mil x 10 ft**	12 months	5 days
	1.25 mil x 16 ft	12 months	5 days
	1.25 mil x 18 ft	12 months	5 days
	1.75 mil x 16 ft	12 months	6 days
	1.75 mil x 18 ft	12 months	6 days
	2 mil x 16 ft	12 months	7 days
Extended Daily Cover	**1.75 mil x 16 ft**	12 months	4 weeks
	1.75 mil x 18 ft	12 months	4 weeks
	2 mil x 18 ft	12 months	5 weeks
Intermediate Cover	**5 mil x 16 ft**	12 months	6 months
	5 mil x 18 ft	12 months	6 months

ATTACHMENT 8

WATER RECLAMATION
SOLID WASTE MANAGEMENT

COUNTY SANITATION DISTRICTS
OF LOS ANGELES COUNTY

1955 Workman Mill Road, Whittier, CA 90601-1400
Mailing Address: P.O. Box 4998, Whittier, CA 90607-4998
Telephone: (562) 699-7411, FAX: (562) 699-5422
www.lacsd.org

JAMES F. STAHL
Chief Engineer and General Manager

March 7, 2005

File No. 31R-109.10

Mr. Ken Murray
County of Los Angeles Department of Health Services
5050 Commerce Drive
Baldwin Park, CA 91706

Dear Mr. Murray:

Alternative Daily Cover Demonstration Project: Plastic Film

The County Sanitation Districts of Los Angeles County (Districts) have completed a demonstration project for assessing the performance of a new plastic film for use as an alternative daily cover (ADC) at the Puente Hills Landfill. Enclosed for your review is a summary report for the subject demonstration project. During the demonstration, the plastic film met the performance standards for ADC as specified in Title 27 CCR §20690 and presents no threat to human health and the environment. Based on the results of this demonstration, the Districts have concluded that the film is resistant to degradation for an exposure time of up to six weeks under conditions expected between the months of October through March. As such, the Districts propose to use the plastic film as an alternative daily cover with an exposure time not to exceed 42 days during those months, and not to exceed 14 days in the summer months of April through September. The 14-day exposure is currently approved for year-round operations. Upon your approval and concurrence with this report, the Districts will submit an amendment to the Puente Hills Landfill Report of Disposal Site Information that documents the exposure time for the use of plastic film as an ADC.

If you require additional information, please contact Monique Valenzuela at (562) 699-7411, extension 2405.

Very truly yours,

James F. Stahl

John D. Kilgore
Supervising Engineer
Planning Section

JK:MV:ld

Enclosure

cc: Pete Oda, DOHS
William Marciniak, CIWMB
Rodney Nelson, RWQCB
Charles Tupac, AQMD

Doc #: 468720
Recycled Paper

Alternative Daily Cover Demonstration Project at the Puente Hills Landfill

County Sanitation District No. 2 of Los Angeles County
1955 Workman Mill Road
Whittier, California 90601

James F. Stahl
Chief Engineer and General Manager

Introduction

The Sanitation Districts conducted an alternative daily cover (ADC) demonstration project to evaluate the use of a plastic film as ADC for a 6-week exposure time at the Puente Hills Landfill (PHLF). This demonstration project is part of an ongoing process of researching and evaluating potential ADC and alternative intermediate cover (AIC) materials to supplement the successful program of already approved ADC materials (i.e. greenwaste and foam) at the Sanitation Districts sites. Using a system of ADCs and AICs assists in both soil and capacity conservation, which are critical at the landfills as well as providing flexibility during daily operations. The Sanitation Districts initiated this project with the assistance and approval of the Los Angeles County Department of Health Services Solid Waste Management Department (Local Enforcement Agency). A Notice of Exemption was filed with the Los Angeles County Clerk. Copies of these documents are included in Appendix A.

Currently, PHLF has approval to use plastic film as an ADC for a 2-week exposure time. The use of plastic film exposed for 6 weeks would conserve soil, occupy zero volume in the landfill, and provide flexibility during daily operations. The focus of this demonstration was to determine whether the film could maintain its integrity for at least six weeks in the most extreme conditions. If at the end of the 6-week time frame, the test plot was inspected and was capable of additional exposure, the material was left exposed until it began to degrade to determine its life expectancy. The project is required by the Department of Health Services, acting as the Local Enforcement Agency (LEA), and the California Integrated Waste Management Board (CIWMB) under Title 27 CCR §20690 to demonstrate that the proposed ADC fulfills the requirements of daily cover and meets the performance standards under Title 27 CCR §20695.

Title 27 CCR §20680 requires at least six inches of compacted earthen material to be placed at the end of each operating day, or at more frequent intervals if necessary. Title 27 CCR §20690(a)(2) requires that alternative daily cover alone, or in combination with compacted earthen material, shall be placed over the entire working face at the end of each operating day or at more frequent intervals to control vectors, fires, odors, blowing litter, and scavenging without presenting a threat to human health and the environment. ADCs currently used at PHLF include plastic film, foam, greenwaste, and greenwaste mixed with dirt. Plastic film is currently used in areas that will not be subsequently buried for up to a 2-week period. Foam is also used as an ADC for areas that will be subsequently buried the next day. At the PHLF, the working face cover is an average of 12-inches thick for shredded greenwaste and shredded greenwaste mixed with dirt. Greenwaste and dirt mix is also used as an alternative intermediate cover (AIC).

Materials and Equipment

The plastic film tested consisted of a 2-mil Progressive Daily Enviro® Cover manufactured by Environmental Products, Inc. (EPI). The Progressive Daily Enviro® Cover is a degradable geosynthetic ADC which does not require removal after its use as a daily cover. It has a specially engineered degradation capability that is triggered in the landfill environment. Degradation of the material is initiated through exposure of the film to heat, mechanical stress and/or sunlight. Any one of these factors could be sufficient to initiate the degradation process. Once the process is initiated, the material continues to degrade and become brittle and fragmented upon burial. It eventually biodegrades, allowing free movement of landfill gas and leachate within the landfill.

Degradation of the film occurs when the carbon bonds in the molecules break down. This results in lowering the molecular weight and the loss of mechanical properties such as tensile strength and elongation. The Progressive Daily Enviro® Cover is specially designed and engineered with high tensile strength, extreme elongation property and tear resistance. Its elongation property allows it to stretch over 5 to 6 times its original length. This allows the Progressive Daily Enviro® Cover to stretch over irregular waste surfaces and allows the loss of elongation property to span over a longer coverage period. In addition to its slower rate of degradation, which distinguishes this material from that previously used at the Puente Hills Landfill, the Progressive Daily Enviro® Cover is purported to have an extended coverage period from a few weeks to several months while complying with the performance requirements of ADC.

Test plots covering approximately 1,400 square feet were placed on areas of the landfill that would not receive refuse for 6 weeks. After the refuse had been placed and compacted, it was covered with the plastic film by the EPI deployment device. The film was held in place with crushed asphalt as ballast, or other suitable ballast material. The film and ballast were placed with an automated EPI deployment device. The rolls of film are 18 feet wide and are placed with an 18 inch overlap. To verify that the plastic film could be used in year round weather conditions, the test plots were constructed in the winter and summer to observe the performance of the ADC under the most extreme weather conditions. Since the plastic film tends to tear or shred as it degrades, areas of the demonstration test plot were patched or covered with dirt as necessary during the demonstration project to prevent exposure of refuse.

The test plots were constructed over a 13 month period spanning July 2003 to August 2004. The first summer test plot was constructed on July 16, 2003 and was exposed for 4.3 weeks, or 30 days, through August 15, 2003. Although the entire test plot was subjected to the same conditions, some panels performed differently than others. As a result, the Sanitation Districts covered the test plot on August 15, 2003. The plastic film utilized in this first test plot began degrading during the third week and became shredded. The manufacturer speculated that the material had prematurely failed due to the use of a roll of film that did not meet product specifications. The daytime temperatures varied from 83 to 97 degrees Fahrenheit during the day. The average high daytime temperature was 92 degrees Fahrenheight. The rainfall received varied from trace amounts of 0.05 inches to 0 inches. The maximum daily wind speed varied from approximately 14 to 27 miles per hour.

The winter test plot was constructed on January 29, 2004 and was exposed for 7.7 weeks, or 54 days, through March 22, 2004. Minor patching was done during the winter test plot, due to punctures in the plastic film from objects in the underlying refuse. At the 6 week time frame, the test plot was inspected, and was capable of additional exposure. The material was exposed for an additional 12 days, until it began to degrade, to determine its life expectancy. The DOHS weekly vector monitoring surveys and the Districts regular monitoring continued during the exposure time beyond 6 weeks. During the winter demonstration time period, the weather was typical for the fall, winter, and spring. The plastic film was exposed to wind, rain, and typical winter temperatures, as well as warmer spring and fall like weather during the winter demonstration. The daytime temperatures varied from 56 to 95 degrees Fahrenheit. The average daytime high temperature was 70 degrees Fahrenheit. The rainfall received in one day varied

from 1.76 to 0 inches. The average rainfall received during the winter demonstration was 0.14 inches per day. The maximum daily wind speed varied from approximately 11 miles per hour to 27 miles per hour.

The second summer test plot was constructed on July 14, 2004 and was exposed for 2.6 weeks, or 18 days, through July 31, 2004. The reason that this test plot was not exposed for 6 weeks is because it is believed the plastic film had already been exposed to the environment while on the deployment device for several weeks prior to the demonstration. Therefore, the degradation process may have begun prematurely due to exposure to the sunlight and heat before being placed on the ADC test plot. During this demonstration period, the daytime high temperatures ranged from 86 to 99 degrees Fahrenheit. The average daytime high temperature was 94 degrees. No rainfall was received during this demonstration period. The maximum daily wind speed varied from approximately 15 to 19 miles per hour.

The third summer test plot was constructed on July 31, 2004 and was exposed for 3.1 weeks, or 22 days, through August 21, 2004. This test plot utilized new plastic film material that had not been previously exposed to the environment. This demonstration did not last 6 weeks due to degradation of the material and extensive patching done during the third week. To prevent exposure of refuse, the areas with holes were patched with pieces of plastic film material or covered with dirt by site forces until the conclusion of the demonstration project. The daytime high temperatures ranged from 83 to 100 degrees Fahrenheit. The average daytime high temperature was 90 degrees Fahrenheit. No rainfall was received during this demonstration period. The maximum daily wind speed varied from approximately 14 to 20 miles per hour.

Monitoring

The Department of Health Services (DOHS) Vector Management Program, Vector-Borne Disease Surveillance Unit was contracted to evaluate the performance of the plastic film. The vector monitoring program consisted of weekly site visits by DOHS staff, during which they assessed fly and rodent population densities. Scudder fly grids were used to determine fly counts and rodent traps were set according to performance standards procedures. Additional data collected by DOHS included ambient temperature and humidity conditions, wind speeds and direction, and visual observation of the plastic film. DOHS concluded that the plastic film met all of the performance requirements for daily refuse coverage during the demonstrations. Copies of the DOHS findings are included in Appendix B.

In addition to the DOHS monitoring, Sanitation Districts staff examined the test plot regularly during the evaluation periods to assess odor, litter, fire control, and scavenging. The plastic film ADC appeared to control odors and litter, no fires occurred, and no scavenging was evident within the test plot areas during the demonstration. Weather data was collected daily to document that the plastic film was exposed to typical weather conditions encountered year round.

Conclusion

The Progressive Daily Enviro® Cover manufactured by EPI met all of the performance criteria set forth in Title 27 CCR §20695 and fulfills the requirements for ADC set forth in §20690. The use of EPI plastic film as an ADC does not present a threat to human health and the environment.

Based on the demonstration results, the Districts are confident that the Progressive Daily Enviro® Cover manufactured by EPI can be exposed for up to 42 days from October through March during the fall, winter, and spring seasons. The Districts will continue to limit exposure of the material to 14 days from April through September.

Appendix A

Appendix A

Jo Houghton

COUNTY OF LOS ANGELES
DEPARTMENT OF HEALTH SERVICES
Public Health

THOMAS L. GARTHWAITE, M.D.
Director and Chief Medical Officer

JONATHAN E. FIELDING, M.D., M.P.H.
Director of Public Health and Health Officer

Environmental Health
ARTURO AGUIRRE, R.E.H.S., M.A.
Director of Environmental Health

Bureau of Environmental Protection
Solid Waste Management Program/L.A. County LEA
5050 Commerce Drive
Baldwin Park California 91706-1423
TEL (626) 430-5540 • FAX (626) 813-3022
www.lapublichealth.org/eh

June 27, 2003

Ms. Theresa Dodge, Supervising Engineer
Solid Waste Management Department
County Sanitation Districts of Los Angeles County
P.O. Box 4998
Whittier, CA 90607-4998

Attention Mr. Joe Houghton

Dear Ms. Dodge:

ALTERNATIVE DAILY COVER (ADC) DEMONSTRATION PROJECT AT THE PUENTE HILLS LANDFILL, SWFP # 19-AA-0053

The Solid Waste Management Program has approved your proposal to evaluate the performance of a thermodegradable film ADC that will be left in place and exposed for up to six weeks. Scott Walker of the California Integrated Waste Management Board (CIWMB) has indicated that approval of this project does not require concurrence by the CIWMB. Therefore, the demonstration project described in the May 23, 2003 correspondence and amended on June 10, 2003 may commence within seven days of this office receiving notification of the construction of the test plots.

At the conclusion of this demonstration, please provide a summary of the project and conclusions as to the suitability leaving this ADC in place up to six weeks in a final report.

If you have any questions concerning this matter, please contact Kim Yapp at (626) 430-5540.

Very truly yours,

Kim Yapp

(fv) Betty Morrison, EHS IV
Solid Waste Management Program

cc: William Marciniak, CIWMB
Rod Nelson, RWQCB
Charles Tupac, SCAQMD
Franklin Hall, DHS

J.F. STAHL
Stephen P. M...

JUL 1 '03 AM 11:07

2504/5

7/1/03

NOTICE OF EXEMPTION

TO: County Clerk
County of Los Angeles
12400 E. Imperial Highway
Norwalk, CA 90650

FROM: County Sanitation District No. 2
of Los Angeles County
1955 Workman Mill Road
Whittier, CA 90601

Project Title:
Alternate Daily Cover (ADC) Demonstration Project at the Puente Hills Landfill

Project Location-Specific:
Puente Hills Landfill
2800 South Workman Mill Road
Whittier, CA 90601

ORIGINAL FILED

JUL 2 2 2002

LOS ANGELES, COUNTY CLERK

Description of Nature, Purpose and Beneficiaries of Project:
The County Sanitation Districts of Los Angeles County (Sanitation Districts) propose to conduct an alternative daily cover (ADC) demonstration project at the Puente Hills Landfill using thermodegradable film(film). The Sanitation Districts had previously conducted an ADC demonstration using film with exposure periods of up to two weeks. The proposed project will evaluate the performance and operational feasibility of using the film as cover with exposure periods of up to six weeks. The Sanitation Districts will determine the effectiveness of this material in complying with regulatory requirements for ADC during the demonstration.

Name of Public Agency Approving Project:
County Sanitation District No. 2 of Los Angeles County

Name of Person or Agency Carrying Out Project:
County Sanitation District No. 2 of Los Angeles County

Exempt Status:
Exempt from CEQA under Section 15306 of the State Guideline for Implementation of CEQA.

Reasons Why Project is Exempt:
The proposed project consists of basic data collection, research, experimental management, and resource evaluation activities which do not result in a serious or major disturbance to an environmental resource. The project is categorically exempt under Article 19, Section 15306.

Contact Person: Joe Houghton **Telephone Number:** (562) 699-7411

Date: 7/19/02

Signature: _____

Grace R. Chan
Planning and Permitting Section Head
Solid Waste Management Department

COUNTY SANITATION DISTRICT NO. 2 OF LOS ANGELES COUNTY
1955 WORKMAN MILL ROAD
WHITTIER, CA 90601

PRELIMINARY ENVIRONMENTAL ASSESSMENT

Name of Project:

Alternate Daily Cover (ADC) Demonstration Project at the Puente Hills Landfill

Location:

Puente Hills Landfill
2800 South Workman Mill Road
Whittier, CA 90601

Entity Undertaking Project:

County Sanitation District No. 2 of Los Angeles County

Staff Determination:

The Sanitation Districts' staff, having undertaken and completed a preliminary review of this project in accordance with the Guidelines for Implementation of the California Environmental Quality Act has concluded that this project does not require further environmental assessment because:

( ) 1. The proposed action does not constitute a project within the meaning of Article 5, Section 15061 and Article 20, Section 15378.

( ) 2. The project constitutes a feasibility or planning study under Article 18, Section 15262.

( ) 3. The project is a ministerial project under Article 18, Section 15268.

( ) 4. The project is an emergency project under Article 18, Section 15269.

(X) 5. The project is categorically exempt under Article 19, Section 15306.

( ) 6. The project involves another public agency which will be the Lead Agency.

Date: 7/19/02

Signature: _____

Grace R. Chan
Planning and Permitting Section Head
Solid Waste Management Department

Appendix B

COUNTY OF LOS ANGELES
DEPARTMENT OF HEALTH SERVICES
Public Health

THOMAS L. GARTHWAITE, M.D.
Director of Health Services and Chief Medical Officer

JONATHAN E. FIELDING, M.D., M.P.H.
Director of Public Health and Health Officer

Environmental Health
ARTURO AGUIRRE, Director

Franklin Hall
Vector Management Program, Chief
5050 Commerce Drive
Baldwin Park, CA 91706
TEL (626) 430-5450 FAX (626) 813-3017

www.lapublichealth.org/eh

November 21, 2003

Mr. Joe Houghton
Solid Waste Management Department
County Sanitation Districts of Los Angeles County
P.O. Box 4998
Whittier, California 90607-4998

Dear Mr. Houghton,

The County of Los Angeles Department of Health Services, Solid Waste Management Program functions as the Local Enforcement Agency (LEA) for landfill operations within the County. The LEA has entered into an agreement with the County Sanitation Districts to conduct two six week surveys utilizing a thermo-film alternate cover material at the Puente Hills Landfill in Whittier. The initial survey commenced on July 28, 2003 and will end sometime in September. The final survey for the project will begin sometime in January, 2004. The intention of the project is to determine whether the material meets the performance standards set in Title 27 California Code of Regulations, Section 20695 as it relates to vector monitoring.

This report is a progress report summarizing the monitoring activities from July 28, 2003 through August 18, 2003.

MONITORING

Staff will conduct a weekly fly count utilizing Scudder fly grids which are placed on and around the experimental pad.. Additionally, a monthly rodent survey uses live traps at the site of the pad and perimeter of the landfill will be completed
.cover material.

LABORATORY

All representative fly and rodent samples collected during the survey will be identified by the Entomology Laboratory within the Vector Management Program. The data will be recorded and included in the monthly reports.

GENERAL ACTIVITIES

On July 28, 2003, staff begin monitoring the site where the experimental pad (film cover) was being used. Scudder fly grids were used on or around the active site to determine the fly index. No evidence of fly activity (I = 0) were observed. The threshold value is I = 6 or six flies.

Additionally, on the third week, a rodent survey was conducted. Two trap lines consisting of twenty rodent traps each were placed around the experimental pad and the perimeter of the landfill overnight. On the following day, no rodents were collected or observed at the sites.

SUMMARY

As a result of the first three week of survey, there was no evidence fly or rodent activity indicating that the alternate cover material was in compliance with the performance standards.

On August 18, 2003 we received notification from your office that the project will be discontinued at this time due to the failure of the

If you have any questions, please contact my office at your convenience.

Very truly yours,

Frank Hall, Chief

cc: Onaga
File

attachments

MONTHLY DATA SHEETS

COUNTY OF LOS ANGELES - DEPARTMENT OF HEALTH SERVICES
ENVIRONMENTAL HEALTH
VECTOR MANAGEMENT PROGRAM
5050 Commerce Drive
Baldwin Park, CA 91706
(626) 430-5450

PERFORMANCE STANDARDS MONITORING FORM (FLY SURVEY)
ALTERNATE DAILY COVER

Name of Site PUENTE HILLS LANDFILL

Address 1955 Workman Mill Road, Whittier, CA 90601

Date: 7-28-03 Survey Week No. 1 Time: Start 1030 End 1230

Temp: 82° °F Humidity: ____% Wind Condition: 15 mph Shade: X Sky Conditions: partly Cloudy

Attractants exposed debris - various areas Inspector: Onaga Cover Used: Film - plastic

COVER PERFORMANCE STANDARDS AS DETERMINED BY Title 14 Section 17683		
WEEKLY SCUDDER GRILL FLY COUNTS		REPRESENTATIVE FLY SPECIES
GRILL SET NO.	NO. OF FLIES OBSERVED	QUALITATIVE SAMPLING PERFORMED WITH A STANDARD INSECT NET YIELDED THE FOLLOWING SPECIES
1	~~0~~	
2	~~0~~	
3	~~0~~	
4	~~0~~	
5	~~0~~	
6	~~0~~	
7	~~0~~	
8	~~0~~	
9	~~0~~	
10	~~0~~	

DETERMINING COMPLIANCE		
Fly survey value calculated by adding the five highest grill counts and dividing by 5: 0 / 5 = 0 Survey Value	Compliance is equal to a Survey Value which is less than the Threshold Value of 6	
	Compliance ☒	Non-compliance ☐

Comments: Observed trash debris at "lane 1", observed holes in lane's 2, 9 & 14, Active landfill at adjacent area.

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ENVIRONMENTAL HEALTH
VECTOR MANAGEMENT PROGRAM
5050 Commerce Drive
Baldwin Park, CA 91706
(626) 430-5450

PERFORMANCE STANDARDS MONITORING FORM (FLY SURVEY)
ALTERNATE DAILY COVER

Name of Site PUENTE HILLS LANDFILL

Address 1955 Workman Mill Road, Whittier, CA 90601

Date: 8-4-03 Survey Week No. 2 Time: Start 1115 Am End 1230p

Temp: 86 °F Humidity: 54 % Wind Condition: 3 SW mph Shade: none Sky Conditions: clear

Attractants Exposed debris - various areas Inspector: Ongaga Cover Used: Film

COVER PERFORMANCE STANDARDS AS DETERMINED BY Title 14 Section 17683		
WEEKLY SCUDDER GRILL FLY COUNTS		REPRESENTATIVE FLY SPECIES
GRILL SET NO.	NO. OF FLIES OBSERVED	QUALITATIVE SAMPLING PERFORMED WITH A STANDARD INSECT NET YIELDED THE FOLLOWING SPECIES
1	0	
2	0	
3	0	
4	0	
5	0	
6	0	
7	0	
8	0	
9	0	
10	0	

DETERMINING COMPLIANCE		
Fly survey value calculated by adding the five highest grill counts and dividing by 5: 0 /5 = 0 Survey Value	Compliance is equal to a Survey Value which is less than the Threshold Value of 6	
	Compliance ☒	Non-compliance ■

Comments: Active Landfill site 200yds east of pad-
Observe no flies or "crawlers"
Observe same holes as last week - lanes 3, 4, 9

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ENVIRONMENTAL HEALTH
VECTOR MANAGEMENT PROGRAM
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Baldwin Park, CA 91706
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PERFORMANCE STANDARDS MONITORING FORM (FLY SURVEY)
ALTERNATE DAILY COVER

Name of Site PUENTE HILLS LANDFILL

Address 1955 Workman Mill Road, Whittier, CA 90601

Date: 8-11-03 Survey Week No. 3 Time: Start 1030 End 1230

Temp: 90 °F Humidity: ____% Wind Condition: 10 SW mph Shade: — Sky Conditions: sunny

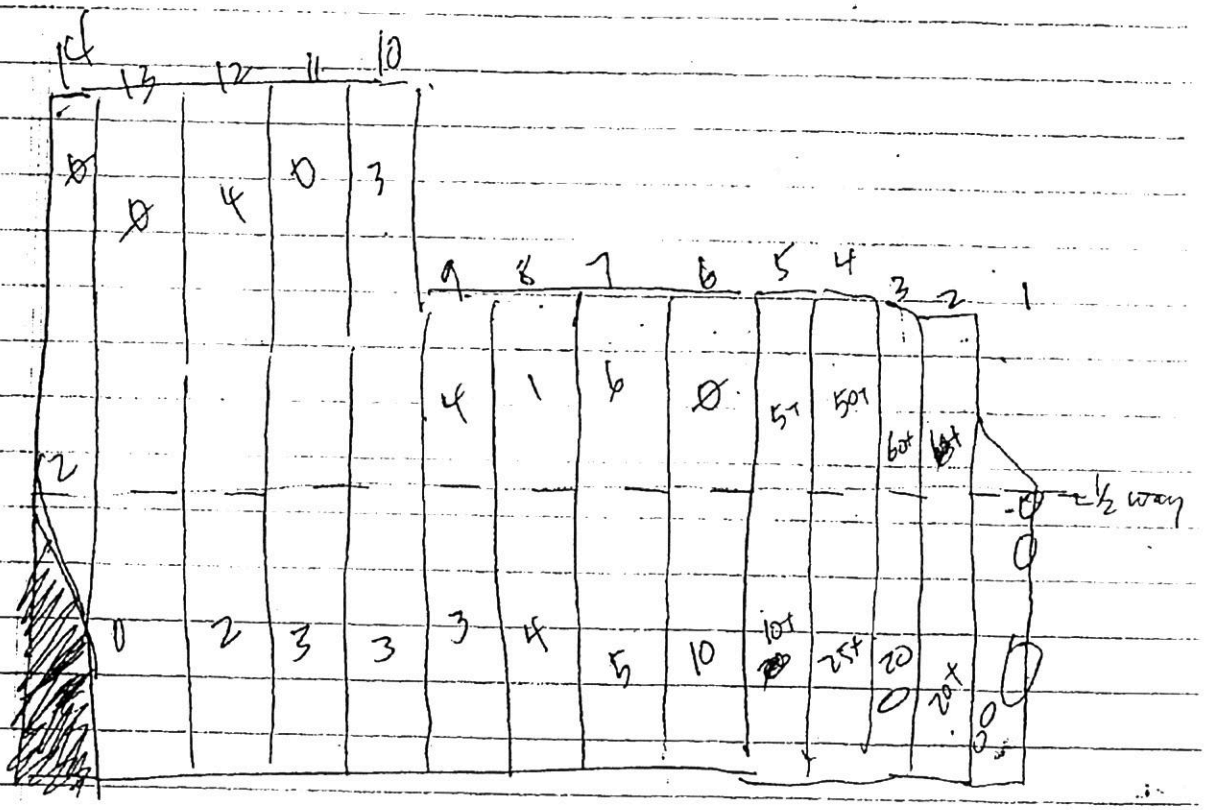
Attractants _____ Inspector: Onaga Cover Used: plastic film

COVER PERFORMANCE STANDARDS AS DETERMINED BY Title 14 Section 17683		
WEEKLY SCUDDER GRILL FLY COUNTS		REPRESENTATIVE FLY SPECIES
GRILL SET NO.	NO. OF FLIES OBSERVED	QUALITATIVE SAMPLING PERFORMED WITH A STANDARD INSECT NET YIELDED THE FOLLOWING SPECIES
1	0	
2	0	
3	0	
4	0	
5	0	
6	0	
7	0	
8	0	
9	0	
10	0	

DETERMINING COMPLIANCE		
Fly survey value calculated by adding the five highest grill counts and dividing by 5: 0 /5 = 0 Survey Value	Compliance is equal to a Survey Value which is less than the Threshold Value of 6	
	Compliance ☒	Non-compliance ☐

Comments: No crawlers observed at perimeter areas. Observed holes in plastic (see drawing).

Aug 11, 2003 Monday



COUNTY OF LOS ANGELES - DEPARTMENT OF HEALTH SERVICES
ENVIRONMENTAL HEALTH
VECTOR MANAGEMENT PROGRAM
5050 Commerce Drive
Baldwin Park, CA 91706
(626) 430-5450

PERFORMANCE STANDARDS MONITORING FORM (RODENT SURVEY)
ALTERNATE DAILY COVER

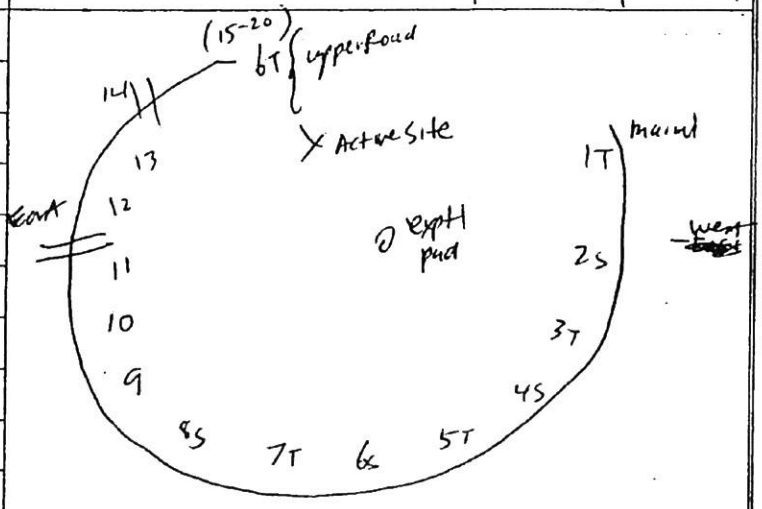
Name of Site PUENTE HILLS LANDFILL

Address 1955 Workman Mill Road, Whittier, CA 90601

Date traps set: 8-11-03 Time: 100 p Date traps retrieved: 8/12/03 Time: 1140 A

Inspector: Onaga

COVER PERFORMANCE STANDARDS AS DETERMINED BY Title 14 Section 17683				
TRAP #	# OF RATS TRAPPED	TRAP #	# OF RATS TRAPPED	DIAGRAM OF TRAPPING AREA
1	0	11	0	
2	0	12	0	
3	0	13	0	
4	0	14	0	
5	0	15	0	
6	0	16	0	
7	0	17	0	
8	0	18	0	
9	0	19	0	
10	0	20	0	



DETERMINING COMPLIANCE		
The trapping of one or more domestic rats (*Rattus*) anywhere on the disposal site indicates non-compliance.	Survey resulted in a total of 0 rats in genus *Rattus*	
	Compliance ☒	Non-compliance ☐

Comments/ Other rodents trapped No rodents caught, 1 Trap missing (#11) 1 damaged Trap (#2).

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ENVIRONMENTAL HEALTH
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PERFORMANCE STANDARDS MONITORING FORM (RODENT SURVEY)
ALTERNATE DAILY COVER

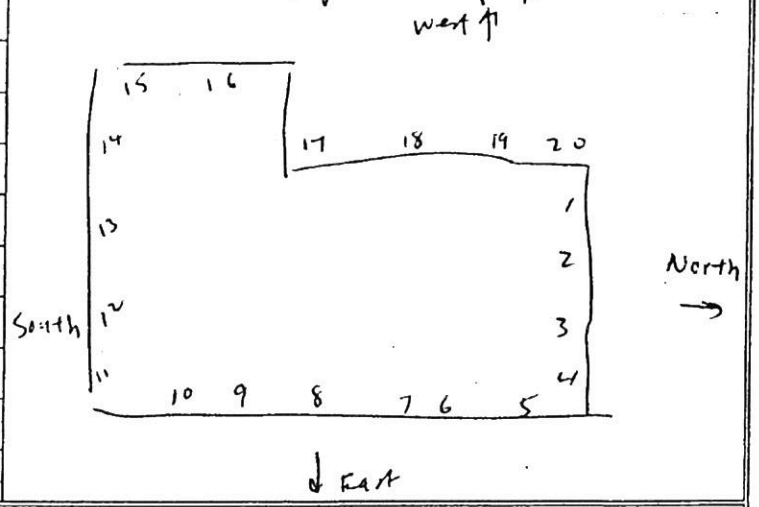
Name of Site PUENTE HILLS LANDFILL

Address 1955 Workman Mill Road, Whittier, CA 90601

Date traps set: 8-11-03 Time: 1230p Date traps retrieved: 8-12-03 Time: 945Am

Inspector: Onaga

COVER PERFORMANCE STANDARDS AS DETERMINED BY Title 14 Section 17683				
TRAP #	# OF RATS TRAPPED	TRAP #	# OF RATS TRAPPED	DIAGRAM OF TRAPPING AREA
1	Ø	11	Ø	Experiment 1 pad
2	Ø	12	Ø	
3	Ø	13	Ø	
4	Ø	14	Ø	
5	Ø	15	Ø	
6	Ø	16	Ø	
7	Ø	17	Ø	
8	Ø	18	Ø	
9	Ø	19	Ø	
10	Ø	20	Ø	



DETERMINING COMPLIANCE		
The trapping of one or more domestic rats (*Rattus*) anywhere on the disposal site indicates non-compliance.	Survey resulted in a total of Ø rats in genus *Rattus*	
	Compliance ☒	Non-compliance ☐

Comments/ Other rodents trapped On day 2, north side panel was covered, one trap missing (#1), No rodents caught.

COUNTY OF LOS ANGELES - DEPARTMENT OF HEALTH SERVICES
ENVIRONMENTAL HEALTH
VECTOR MANAGEMENT PROGRAM
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PERFORMANCE STANDARDS MONITORING FORM (FLY SURVEY)
ALTERNATE DAILY COVER

Name of Site PUENTE HILLS LANDFILL

Address 1955 Workman Mill Road. Whittier. CA 90601

Date: Aug 18, 2003 Survey Week No. 4 Time: Start — End —

Temp: — °F Humidity: — % Wind Condition: — mph Shade: — Sky Conditions: —

Attractants — Inspector: Onaga Cover Used: plastic film

COVER PERFORMANCE STANDARDS AS DETERMINED BY Title 14 Section 17683		
WEEKLY SCUDDER GRILL FLY COUNTS		REPRESENTATIVE FLY SPECIES
GRILL SET NO.	NO. OF FLIES OBSERVED	QUALITATIVE SAMPLING PERFORMED WITH A STANDARD INSECT NET YIELDED THE FOLLOWING SPECIES
1		
2		
3		
4		Sampling
5		
6	NO	
7		
8		
9		
10		

DETERMINING COMPLIANCE		
Fly survey value calculated by adding the five highest grill counts and dividing by 5: — /5 = — Survey Value	Compliance is equal to a Survey Value which is less than the Threshold Value of 6	
	Compliance ☐	Non-compliance ☐

Comments: Received notification - experiment has been stopped due to failure of cover. No immediate plans to create another experimental pad.

COUNTY OF LOS ANGELES
DEPARTMENT OF HEALTH SERVICES
Public Health

FRED LEAF, Chief Operating Officer

JONATHAN E. FIELDING, M.D., M.P.H.
Director of Public Health and Health Officer

Environmental Health
ARTURO AGUIRRE, R.E.H.S., M.A.
Director of Environmental Health

Bureau of Consumer Protection
Vector Management Program
Franklin Hall, Chief
5050 Commerce Drive
Baldwin Park, CA 91706
TEL (626) 430-5450 ● FAX (626) 813-3017

www.lapublichealth.org/eh

April 15, 2004

Mr. Joe Hougton, Project Engineer
1955 Workman Mill Road
Whittier, California 90601

INTRODUCTION

The County of Los Angeles Department of Health Services (DHS), Solid Waste Management Program functions as the Local Enforcement Agency (LEA) for landfill operations within the limits of the County. The LEA has entered into an agreement with the County Sanitation Districts (District) to conduct a six week demonstration project utilizing an alternate cover material. The performance standards monitoring and schedule for the proposed demonstration project were agreed to between the LEA and the District.

The agreement provides for a six week study that begun on January 29, 2004 and ended March 30, 2004. The site for the demonstration project is the Puente Hills Landfill, Whittier.

This is a report summarizing the monitoring activities by the Vector Management Program during the project period. The results will be forwarded to the LEA and the District for compliance review.

MONITORING

Program staff monitored the site where the cover is used on a weekly basis to assess the fly and rodent population densities. When the material was placed on the active site, Scudder fly grids are used to determine the fly counts. Additionally, a rodent survey utilizing a total of 40 traps set adjacent to the active site and the perimeter of the landfill was conducted during the project period.. The results of all the sampling activities have been noted in the reports attached.

LABORATORY

All representative fly and rodent samples collected were identified by the Entomology Laboratory within the Vector Management Program and recorded on the data sheets and included in this monthly reports.

SUMMARY

During the initial period (first two weeks) of the project covering the month of February, very few flies were observed during each weekly visit. The total number of flies observed was below the threshold value of 6, the state performance standard level for compliance. Staff did note observing debris, holes and animal tracks on the surface of the alternate cover material. In the latter two weeks of the month, no flies were observed. This could be attributed to the weather conditions as recent rains resulted in damp and muddy conditions at the survey site. A sampling of the flies collected using sweep nets were identified as *Fannia canicularis*, the lesser house fly, which is common to southern California.

In the last part of the project which covered the month of March, a single fly was observed on the active site during the all weekly surveys. Again the flies were below the threshold value of 6 and met the state performance standard for compliance. In addition, a rodent survey was conducted at the active site and adjacent to the perimeter of the landfill. No rodents were trapped however, one skunk was collected and later released.

In summary, the use of the alternate cover material used during this study project did meet the state performance standards as it relates to vectors.

Thank you for the opportunity to work with your agency and if you have any questions, please contact me or Doreen Kearney at (626) 430-5450.

Very truly yours,

Frank Hall, Chief

Attachments

cc: Kearney

"To Enrich Lives Through Effective And Caring Service"

MONTHLY DATA SHEETS

"To Enrich Lives Through Effective And Caring Service"

COUNTY OF LOS ANGELES - DEPARTMENT OF HEALTH SERVICES
ENVIRONMENTAL HEALTH
VECTOR MANAGEMENT PROGRAM
5050 Commerce Drive
Baldwin Park, CA 91706
(626) 430-5450

PERFORMANCE STANDARDS MONITORING FORM (FLY SURVEY)
ALTERNATE DAILY COVER

Name of Site PUENTE HILLS LANDFILL

Address 1955 Workman Mill Road, Whittier, CA 90601

Date: 3-4-04 Survey Week No. 5 Time: Start 11:00 End 4:50

Temp: 65 °F Humidity: 63 % Wind Condition: 10 mph Shade: 0 Sky Conditions: PARTLY CLOUDY

Attractants SCATTERED REFUSE Inspector: KEARNEY Cover Used: FILM

COVER PERFORMANCE STANDARDS AS DETERMINED BY Title 14 Section 17683		
WEEKLY SCUDDER GRILL FLY COUNTS		REPRESENTATIVE FLY SPECIES
GRILL SET NO.	NO. OF FLIES OBSERVED	QUALITATIVE SAMPLING PERFORMED WITH A STANDARD INSECT NET YIELDED THE FOLLOWING SPECIES
1	0	
2	0	
3	0	
4	0	
5	0	
6	0	
7	0	
8	0	
9	0	
10	1	

DETERMINING COMPLIANCE		
Fly survey value calculated by adding the five highest grill counts and dividing by 5:	Compliance is equal to a Survey Value which is less than the Threshold Value of 6	
1 /5 = 0.2 Survey Value	Compliance ☒	Non-compliance ☐

Comments: MOST OF THE PERIMETER OF THE COVER IS MUDDY. THERE IS A POOL OF WATER AT THE BOTTOM RIGHT COVER. (IT RAINED 3-1+2). IT IS WINDY AT THE TOP OF THE COVER - FLIES WOULD NOT LAND ON THE GRID. THERE IS A 2½-3 FOOT TEAR IN THE COVER NEAR THE CENTER AND SOME NEW DEBRIS SCATTERED BY DOGS OR COYOTE (PRINTS - OBSERVED) NEAR THE BOTTOM CENTER. SITE IS VERY BUSY TODAY. NO FLIES WERE CAUGHT WHILE SWEEPING GRID.

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ENVIRONMENTAL HEALTH
VECTOR MANAGEMENT PROGRAM
5050 Commerce Drive
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(626) 430-5450

PERFORMANCE STANDARDS MONITORING FORM (RODENT SURVEY)
ALTERNATE DAILY COVER

Name of Site PUENTE HILLS LANDFILL

Address 1955 Workman Mill Road, Whittier, CA 90601

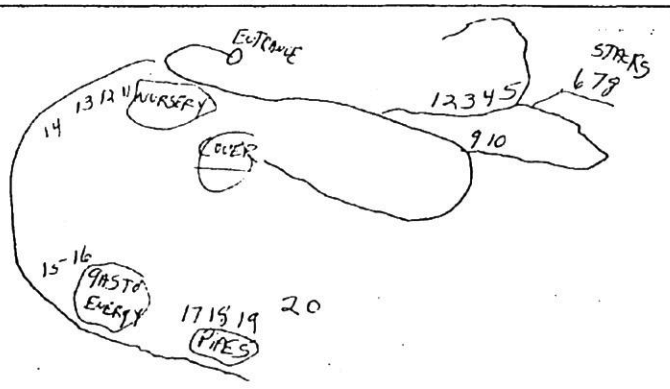
Date traps set: 3-4-04 Time: 11:00 AM Date traps retrieved: 3-5-04 Time: 11:00 AM

Inspector: DOREEN KEARNEY

COVER PERFORMANCE STANDARDS AS DETERMINED BY Title 14 Section 17683

TRAP #	# OF RATS TRAPPED	TRAP #	# OF RATS TRAPPED
1	0	11	0
2	0	12	0
3	0	13	0
4	0	14	0 SKUNK
5	0	15	0
6	0	16	0
7	0	17	0
8	0	18	0
9	0	19	0
10	0	20	0

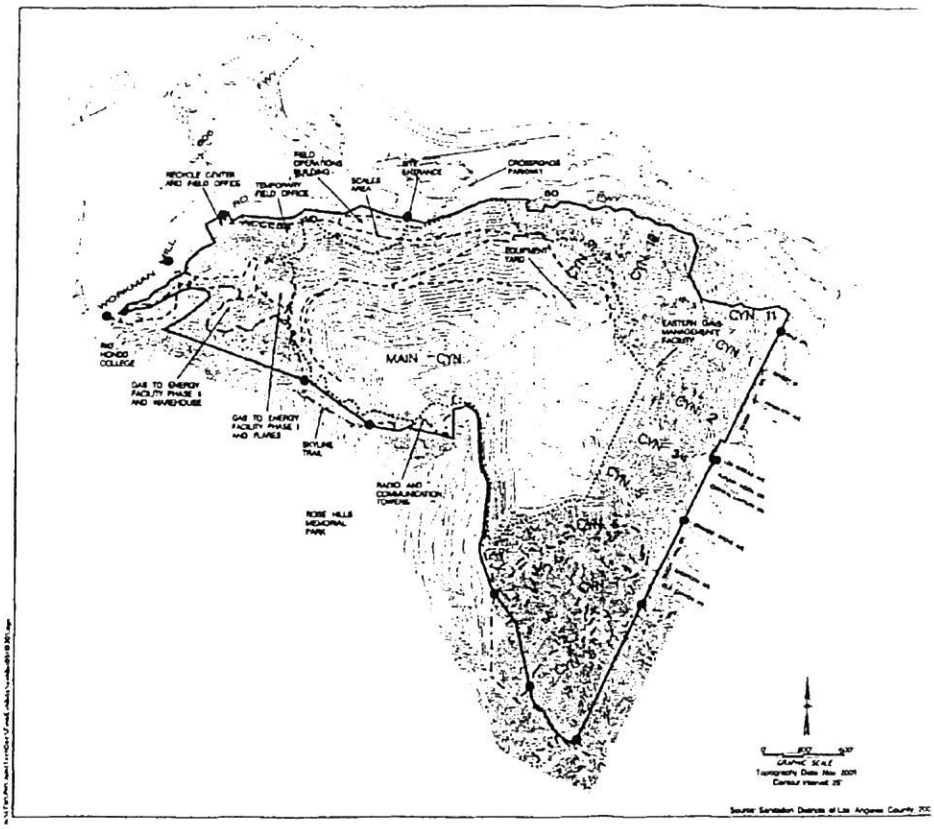
DIAGRAM OF TRAPPING AREA
PERIMETER OF LANDFILL



DETERMINING COMPLIANCE

The trapping of one or more domestic rats (*Rattus*) anywhere on the disposal site indicates non-compliance.	Survey resulted in a total of 0 rats in genus *Rattus*	
	Compliance ☒	Non-compliance ☐

Comments/ Other rodents trapped AT LEAST 50% OF TRAPS WERE OPEN WITH BAIT TAKEN - Possibly by Birds or SMALL RODENTS. TWENTY TOMAHAWK TRAPS WERE SET ALONG THE PERIMETER OF THE LANDFILL. NO RATTUS RODENTS WERE CAUGHT. ONE SKUNK WAS TRAPPED AT #14 (SET IN THE NURSERY) AND RELEASED. OBSERVED HAWKS, GROUND SQUIRRELS AND HUMANS.


RECYCLE CENTER AND FIELD OFFICE
FIELD OPERATIONS BUILDING
TEMPORARY FIELD OFFICE
SCALES AREA
SITE ENTRANCE
CROSSROADS PARKWAY
EQUIPMENT YARD
MAIN CYN.
CYN. 11
EASTERN GAS MANAGEMENT FACILITY
CYN. 1
CYN. 2
CYN. 3
CYN. 4
CYN. 5
CYN. 6
CYN. 7
CYN. 8
CYN. 9
CYN. 10
RIO HONDO COLLEGE
GAS TO ENERGY FACILITY PHASE II AND WAREHOUSE
GAS TO ENERGY FACILITY PHASE I AND FLARES
SKYLINE TRAIL
RADIO AND COMMUNICATION TOWERS
ROSE HILLS MEMORIAL PARK
GRAPHIC SCALE
Topography Date: Nov. 2001
Contour Interval: 25'
Source: Sanitation Districts of Los Angeles County, 200

COUNTY OF LOS ANGELES - DEPARTMENT OF HEALTH SERVICES
ENVIRONMENTAL HEALTH
VECTOR MANAGEMENT PROGRAM
5050 Commerce Drive
Baldwin Park, CA 91706
(626) 430-5450

PERFORMANCE STANDARDS MONITORING FORM (RODENT SURVEY)
ALTERNATE DAILY COVER

Name of Site PUENTE HILLS LANDFILL

Address 1955 Workman Mill Road, Whittier, CA 90601

Date traps set: 3-4-04 Time: 11:00 AM Date traps retrieved: 3-5-04 Time: 11:00 AM

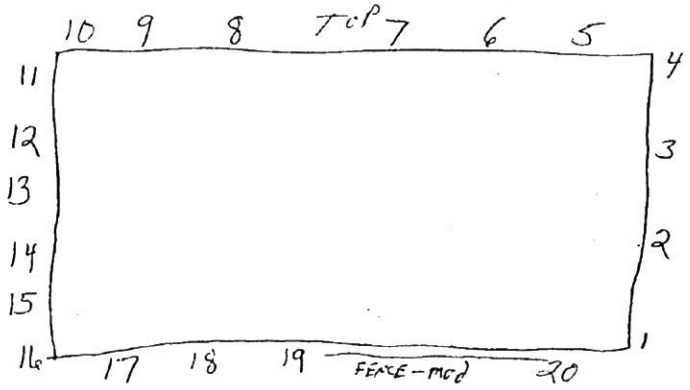
Inspector: DOREEN KEARNEY

COVER PERFORMANCE STANDARDS AS DETERMINED BY Title 14 Section 17683

TRAP #	# OF RATS TRAPPED	TRAP #	# OF RATS TRAPPED
1	0	11	0
2	0	12	0
3	0	13	0
4	0	14	0
5	0	15	0
6	0	16	0
7	0	17	0
8	0	18	0
9	0	19	0
10	0	20	0

DIAGRAM OF TRAPPING AREA

ALTERNATE COVER / EXPERIMENTAL PAD



DETERMINING COMPLIANCE

The trapping of one or more domestic rats (*Rattus*) anywhere on the disposal site indicates non-compliance.

Survey resulted in a total of 0 rats in genus *Rattus*

Compliance ☒ Non-compliance ☐

Comments/ Other rodents trapped TWENTY TOMAHAWK TRAPS BAITED WITH FRITOES AND CORNCHIPS WITH PEANUT BUTTER. ONE TRAP WAS COVERED IN MUD A FEW TRAPS WERE CLOSED. NO ANIMALS CAUGHT. ALL TRAPS WERE RECOVERED.

COUNTY OF LOS ANGELES - DEPARTMENT OF HEALTH SERVICES
ENVIRONMENTAL HEALTH
VECTOR MANAGEMENT PROGRAM
5050 Commerce Drive
Baldwin Park, CA 91706
(626) 430-5450

PERFORMANCE STANDARDS MONITORING FORM (FLY SURVEY)
ALTERNATE DAILY COVER

Name of Site PUENTE HILLS LANDFILL

Address 1955 Workman Mill Road. Whittier. CA 90601

Date: 3-10-04 Survey Week No. 6 Time: Start 11:45 End 12:45

Temp: 80 °F Humidity: 40 % Wind Condition: 6 mph Shade: 0 Sky Conditions: CLEAR

Attractants REFUSE Inspector: DOREEN KEARNEY Cover Used: FILM

COVER PERFORMANCE STANDARDS AS DETERMINED BY Title 14 Section 17683		
WEEKLY SCUDDER GRILL FLY COUNTS		REPRESENTATIVE FLY SPECIES
GRILL SET NO.	NO. OF FLIES OBSERVED	QUALITATIVE SAMPLING PERFORMED WITH A STANDARD INSECT NET YIELDED THE FOLLOWING SPECIES
1	0	
2	0	
3	0	
4	0	
5	0	
6	0	
7	0	
8	0	
9	0	
10	0	(2 - Fannia spp. Caught in net)

DETERMINING COMPLIANCE		
Fly survey value calculated by adding the five highest grill counts and dividing by 5: 0 /5 = 0 Survey Value	Compliance is equal to a Survey Value which is less than the Threshold Value of 6	
	Compliance ☒	Non-compliance ☐

Comments: TODAY WAS MUCH WARMER THAN MOST OTHER SURVEY DAYS. THERE IS LITTLE MUD LEFT FROM LAST WEEKS RAIN. THERE ARE VERY FEW NEW HOLES IN THE COVER - EXCEPT WHERE A BIRD OR DOG/COYOTE PULLED ITEMS OUT THE ACTIVE FACE IS 300-500 FT. AWAY. OBSERVED A FEW FLIES FLYING AROUND BUT NONE ON THE GRID.

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VECTOR MANAGEMENT PROGRAM
5050 Commerce Drive
Baldwin Park, CA 91706
(626) 430-5450

PERFORMANCE STANDARDS MONITORING FORM (FLY SURVEY)
ALTERNATE DAILY COVER

Name of Site PUENTE HILLS LANDFILL

Address 1955 Workman Mill Road, Whittier, CA 90601

Date: 3-17-04 Survey Week No. 7 Time: Start 12:15 End 1:30

Temp: 89.6 °F Humidity: 26 % Wind Condition: 6 SW mph Shade: 0 Sky Conditions: CLEAR

Attractants SCATTERED REFUSE Inspector: KEARNEY Cover Used: FILM

COVER PERFORMANCE STANDARDS AS DETERMINED BY Title 14 Section 17683		
WEEKLY SCUDDER GRILL FLY COUNTS		REPRESENTATIVE FLY SPECIES
GRILL SET NO.	NO. OF FLIES OBSERVED	QUALITATIVE SAMPLING PERFORMED WITH A STANDARD INSECT NET YIELDED THE FOLLOWING SPECIES
1	0	
2	0	
3	0	
4	0	
5	0	
6	0	
7	0	
8	0	
9	0	
10	0	

DETERMINING COMPLIANCE		
Fly survey value calculated by adding the five highest grill counts and dividing by 5: 0 / 5 = 0 Survey Value	Compliance is equal to a Survey Value which is less than the Threshold Value of 6	
	Compliance ☒	Non-compliance ☐

Comments: TODAY WAS A HOT, DRY, SUNNY DAY. MOST OF THE MUD HAS DRIED EXCEPT FOR THE BOTTOM PORTION (CENTER). THE ACTIVE FACE IS FARTHER AWAY THAN LAST WEEK. FLIES WERE NOT OBSERVED TODAY, ONLY A FEW SMALL GNATS TO BE SEEN. SOME DIRT HAS COVERED THE FILM AT THE TOP LEFT SIDE

COUNTY OF LOS ANGELES - DEPARTMENT OF HEALTH SERVICES
ENVIRONMENTAL HEALTH
VECTOR MANAGEMENT PROGRAM
5050 Commerce Drive
Baldwin Park, CA 91706
(626) 430-5450

PERFORMANCE STANDARDS MONITORING FORM (FLY SURVEY)
ALTERNATE DAILY COVER

Name of Site PUENTE HILLS LANDFILL

Address 1955 Workman Mill Road, Whittier, CA 90601

Date: 2-5-04 Survey Week No. 1 Time: Start 1345 End 200

Temp: 68 °F Humidity: 49 % Wind Condition: 4 mph Shade: C Sky Conditions: CLEAR

Attractants _____ Inspector: DOREEN KEARNEY Cover Used: PLASTIC FILM

COVER PERFORMANCE STANDARDS AS DETERMINED BY Title 14 Section 17683		
WEEKLY SCUDDER GRILL FLY COUNTS		REPRESENTATIVE FLY SPECIES
GRILL SET NO.	NO. OF FLIES OBSERVED	QUALITATIVE SAMPLING PERFORMED WITH A STANDARD INSECT NET YIELDED THE FOLLOWING SPECIES
1	0	
2	2	FANNIA Spp.
3	0	
4	0	
5	0	
6	0	
7	0	
8	0	
9	0	
10	2	FANNIA Spp.

DETERMINING COMPLIANCE		
Fly survey value calculated by adding the five highest grill counts and dividing by 5: 4 / 5 = .8 Survey Value	Compliance is equal to a Survey Value which is less than the Threshold Value of 6	
	Compliance ☒	Non-compliance ☐

Comments: THE COVER HAD SOME TEARS POSSIBLY CAUSED BY BIRDS PENETRATING THROUGH THE COVER - OTHERS WERE MADE BY A COYOTE OR DOG AS I OBSERVED PAWPRINTS ON TOP + BOTTOM OF FACE. THERE WAS SOME SCATTERED + BLOWING DEBRIS NEAR COVER + SOME OUTSIDE OF COVER. OBSERVED A FEW FLIES, A BEE AND A TIRE FULL OF WATER OVER THE COVER NEAR BY THE EDGE.
LESSER HOUSE FLY
+
COMMON BLUE FLY

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PERFORMANCE STANDARDS MONITORING FORM (FLY SURVEY)
ALTERNATE DAILY COVER

Name of Site PUENTE HILLS LANDFILL

Address 1955 Workman Mill Road, Whittier, CA 90601

Date: 2-11-04 Survey Week No. 2 Time: Start 1:00 End 2:30

Temp: 73 °F Humidity: 22% Wind Condition: WSW 6 mph Shade: 0 Sky Conditions: CLEAR

Attractants _____ Inspector: DOREEN KEARNEY Cover Used: PLASTIC FILM

COVER PERFORMANCE STANDARDS AS DETERMINED BY Title 14 Section 17683		
WEEKLY SCUDDER GRILL FLY COUNTS		REPRESENTATIVE FLY SPECIES
GRILL SET NO.	NO. OF FLIES OBSERVED	QUALITATIVE SAMPLING PERFORMED WITH A STANDARD INSECT NET YIELDED THE FOLLOWING SPECIES
1	0	
2	0	
3	1	
4	0	
5	0	
6	0	
7	0	
8	0	
9	0	
10	7	

DETERMINING COMPLIANCE		
Fly survey value calculated by adding the five highest grill counts and dividing by 5: 8 /5 = 1.6 Survey Value	Compliance is equal to a Survey Value which is less than the Threshold Value of 6	
	Compliance ☒	Non-compliance ☐

Comments: THE TOP RIGHT SIDE OF THE COVER APPEARS TO HAVE BEEN DRIVEN OVER ALLOWING SOME DEBRIS TO BE EXPOSED AND THE COVER SLIGHTLY TORN. A NEW ROAD IS UNDER CONSTRUCTION JUST SOUTH OF THE COVER. THERE WAS SOME SCATTERED DEBRIS + A FEW SMALL PUNCTURES ON THE COVER PROBABLY DUE TO BIRDS. A FEW FLIES WERE OBSERVED

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PERFORMANCE STANDARDS MONITORING FORM (FLY SURVEY)
ALTERNATE DAILY COVER

Name of Site PUENTE HILLS LANDFILL

Address 1955 Workman Mill Road, Whittier, CA 90601

Date: 2-20-04 Survey Week No. 3 Time: Start 1145 End 1:00 PM

Temp: 57 °F Humidity: 78.6 % Wind Condition: 5 mph Shade: ~~0~~ Sky Conditions: OVERCAST

Attractants SOME SCATTERED REFUSE Inspector: DOREEN KEARNEY Cover Used: FILM

COVER PERFORMANCE STANDARDS AS DETERMINED BY Title 14 Section 17683		
WEEKLY SCUDDER GRILL FLY COUNTS		REPRESENTATIVE FLY SPECIES
GRILL SET NO.	NO. OF FLIES OBSERVED	QUALITATIVE SAMPLING PERFORMED WITH A STANDARD INSECT NET YIELDED THE FOLLOWING SPECIES
1	~~0~~	
2	~~0~~	
3	~~0~~	
4	~~0~~	
5	~~0~~	
6	~~0~~	
7	~~0~~	
8	~~0~~	
9	~~0~~	
10	~~0~~	

DETERMINING COMPLIANCE		
Fly survey value calculated by adding the five highest grill counts and dividing by 5: ~~0~~ /5 = ~~0~~ Survey Value	Compliance is equal to a Survey Value which is less than the Threshold Value of 6	
	Compliance ☒	Non-compliance ☐

Comments: THE ACTIVE FACE WAS NEARBY TODAY DUE TO RAIN. IT IS COLD AND VERY DAMP. SOME DIRT IS COVERING THE DAMAGED RIGHT HAND PORTION OF FACE WHICH IS IN FAIRLY GOOD CONDITION. THERE IS LITTLE CHANGE IN THE COVER FROM LAST WEEK EXCEPT FOR A FEW SMALL WATER PUDDLES. OBSERVED TWO SMALL FLIES ON THE COVER ABLE IN THE AIR.

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PERFORMANCE STANDARDS MONITORING FORM (FLY SURVEY)
ALTERNATE DAILY COVER

Name of Site PUENTE HILLS LANDFILL

Address 1955 Workman Mill Road, Whittier, CA 90601

Date: 2-25-04 Survey Week No. 4 Time: Start 1130 End 12:45

Temp: 62 °F Humidity: 51 % Wind Condition: S-5 mph Shade: 0 Sky Conditions: OVERCAST

Attractants SCATTERED DEBRIS Inspector: D. KEARNEY Cover Used: FILM

COVER PERFORMANCE STANDARDS AS DETERMINED BY Title 14 Section 17683		
WEEKLY SCUDDER GRILL FLY COUNTS		REPRESENTATIVE FLY SPECIES
GRILL SET NO.	NO. OF FLIES OBSERVED	QUALITATIVE SAMPLING PERFORMED WITH A STANDARD INSECT NET YIELDED THE FOLLOWING SPECIES
1	0	
2	0	
3	0	
4	0	
5	0	
6	0	
7	0	
8	0	
9	0	
10	0	

DETERMINING COMPLIANCE		
Fly survey value calculated by adding the five highest grill counts and dividing by 5: 0 /5 = 0 Survey Value	Compliance is equal to a Survey Value which is less than the Threshold Value of 6	
	Compliance ☒	Non-compliance ☐

Comments: DUE TO RECENT RAIN THE DIRT AROUND THE COVER IS MOSTLY MUD. OBSERVED DOG OR COYOTE TRACKS AROUND MUCH OF THE COVER (FRESH). THE ACTIVE FIRE IS NEARBY TODAY AND ATTRACTING MANY BIRDS. THERE ARE JUST A FEW NEW PUNCTURES PROBABLY CAUSED BY BIRDS OR COYOTE + SOME PILED OUT REFUSE. OBSERVED A FEW SMALL FLIES ON OR NEAR THE FILM COVER.

COUNTY OF LOS ANGELES
DEPARTMENT OF HEALTH SERVICES
Public Health

FRED LEAF, Chief Operating Officer

JONATHAN E. FIELDING, M.D., M.P.H.
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Environmental Health
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Bureau of Consumer Protection
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www.lapublichealth.org/eh

October 15, 2004

Mr. Joe Hougton, Project Engineer
1955 Workman Mill Road
Whittier, California 90601

INTRODUCTION

The County of Los Angeles Department of Health Services (DHS), Solid Waste Management Program functions as the Local Enforcement Agency (LEA) for landfill operations within the limits of the County. The LEA has entered into an agreement with the County Sanitation Districts (District) to conduct a six week demonstration project utilizing an alternate cover material. The performance standards monitoring and schedule for the proposed demonstration project were agreed to between the LEA and the District.

The agreement provides for a six week study that begun on July, 2004 and ended September 2004, 2004. The site for the demonstration project is the Puente Hills Landfill, Whittier.

This is a report summarizing the monitoring activities by the Vector Management Program during the project period. The results will be forwarded to the LEA and the District for compliance review.

MONITORING

Program staff monitored the site where the cover is used on a weekly basis to assess the fly and rodent population densities. When the material was placed on the active site, Scudder fly grids are used to determine the fly counts. Additionally, a rodent survey utilizing a total of 40 traps set adjacent to the active site and the perimeter of the landfill was conducted during the project period.. The results of all the sampling activities have been noted in the reports attached.

LABORATORY

All representative fly and rodent samples collected were identified by the Entomology Laboratory within the Vector Management Program and recorded on the data sheets and included in this monthly reports.

SUMMARY

During the initial period (first five weeks) of the project covering parts of the month of July and August, no flies were observed during each weekly visit. Although no flies were observed, a few gnats and yellow-jacket wasps were seen in and around the film cover.

During the first two weekly visits, the winds were moderately strong and conditions around the site were warm and dry. Some tears were evident in the film cover and repairs to patch these were scheduled. On the third week, no flies were observed and the film cover had been repaired. In the last two weeks, the wind or possibly animals (coyotes) had caused additional tears. On the tears, dirt was placed on top to minimize additional damage.

As a result of the on-going tearing problem with the film cover, the survey project was temporarily placed on hold and will be resumed at a later date.

If you have any questions, please contact me or Doreen Kearney at (626) 430-5450.

Very truly yours,

Frank Hall, Chief

Attachments

cc: LEA-Solid Waste Management Program
Kearney

COUNTY OF LOS ANGELES
DEPARTMENT OF HEALTH SERVICES
Public Health

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October 27, 2004

Ms Monique Valenzuela, Project Engineer
1955 Workman Mill Road
Whittier, California 90601

This report summarizes the six week alternate cover material project which initially begin in July and concluded on October 18, 2004 after some delays. During the entire monitoring period at the Puente Hills Landfill, no flies were observed during each weekly visit. In fact, only a few nuisance pests such as gnats and yellow-jacket wasps were seen in and around the alternate cover (film) material.

During each weekly visit to the site, no flies were observed on the active area. On the third week, the film covered was replaced and the scheduled rodent trapping survey was cancelled as a result. Enclosed for your review are the inspection results for each weekly visit

In summary, the alternate cover material did meet the specifications of the state performance standards and in compliance as it relates to vectors.

Thank you for the opportunity to work with your agency during this period and if you have any questions, please contact me or Doreen Kearney at (626) 430-5450.

Very truly yours,

Frank Hall, Chief

Attachments

cc: LEA-Solid Waste Management Program

"To Enrich Lives Through Effective And Caring Service"

DOC #

COUNTY OF LOS ANGELES - DEPARTMENT OF HEALTH SERVICES
ENVIRONMENTAL HEALTH
VECTOR MANAGEMENT PROGRAM
5050 Commerce Drive
Baldwin Park, CA 91706
(626) 430-5450

PERFORMANCE STANDARDS MONITORING FORM (FLY SURVEY)
ALTERNATE DAILY COVER

Name of Site PUENTE HILLS LANDFILL

Address 1955 Workman Mill Road, Whittier, CA 90601

Date: 7-21-04 Survey Week No. 1 Time: Start 12:00 End 1:00 pm

Temp: 87 °F Humidity: 63 % Wind Condition: WSW 5-10 mph Shade: 0 Sky Conditions: CLEAR

Attractants — Inspector: KEARNEY Cover Used: FILM

COVER PERFORMANCE STANDARDS AS DETERMINED BY Title 14 Section 17683		
WEEKLY SCUDDER GRILL FLY COUNTS		REPRESENTATIVE FLY SPECIES
GRILL SET NO.	NO. OF FLIES OBSERVED	QUALITATIVE SAMPLING PERFORMED WITH A STANDARD INSECT NET YIELDED THE FOLLOWING SPECIES
1	0	
2	0	
3	0	
4	0	
5	0	
6	0	
7	0	
8	0	
9	0	
10	0	

DETERMINING COMPLIANCE		
Fly survey value calculated by adding the five highest grill counts and dividing by 5: 0 /5 = 0 Survey Value	Compliance is equal to a Survey Value which is less than the Threshold Value of 6	
	Compliance ☒	Non-compliance ☐

Comments: Today is the first day of the summer 04 survey. The film cover is on a large curved area, the film is in good condition. There is a small amount of debris on the right side of the face. It is hot and dry today with a breeze causing the film to ripple which may keep the flys away - only a few gnats were observed no other insects observed.

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PERFORMANCE STANDARDS MONITORING FORM (FLY SURVEY)
ALTERNATE DAILY COVER

Name of Site PUENTE HILLS LANDFILL

Address 1955 Workman Mill Road, Whittier, CA 90601

Date: 7-28-04 Survey Week No. 2 Time: Start 1300 End 130

Temp: 83 °F Humidity: 40 % Wind Condition: 5-10 mph Shade: 0 Sky Conditions: CLEAR

Attractants — Inspector: DOREEN KEARNEY Cover Used: FILM

COVER PERFORMANCE STANDARDS AS DETERMINED BY Title 14 Section 17683		
WEEKLY SCUDDER GRILL FLY COUNTS		REPRESENTATIVE FLY SPECIES
GRILL SET NO.	NO. OF FLIES OBSERVED	QUALITATIVE SAMPLING PERFORMED WITH A STANDARD INSECT NET YIELDED THE FOLLOWING SPECIES
1	0	
2	0	
3	0	
4	0	
5	0	
6	0	
7	0	
8	0	
9	0	
10	0	

DETERMINING COMPLIANCE		
Fly survey value calculated by adding the five highest grill counts and dividing by 5: 0 /5 = 0 Survey Value	Compliance is equal to a Survey Value which is less than the Threshold Value of 6	
	Compliance ☒	Non-compliance ☐

Comments: TODAY SEEMED COOLER AND LESS WINDY THAN LAST WEEK. FLIES WERE NOT OBSERVED ONLY GNATS IN A FEW SPOTS AROUND THE FILM. THE DIRT AROUND THE FILM IS DRY + DUSTY WITH SOME SOFT MULCH ON THE SIDES. OBSERVED A FEW MORE TEARS IN THE FILM, SOME CAUSED BY DOG OR COYOTE AS PRINTS COULD BE SEEN IN SOME SECTIONS.

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PERFORMANCE STANDARDS MONITORING FORM (FLY SURVEY)
ALTERNATE DAILY COVER

Name of Site PUENTE HILLS LANDFILL

Address 1955 Workman Mill Road, Whittier, CA 90601

Date: 8-4-04 Survey Week No. 1 Time: Start 12:00 End 12:30

Temp: 80 °F Humidity: 43 % Wind Condition: 5-10 (13 mph gust) mph Shade: C Sky Conditions: Hazy

Attractants NONE Inspector: DOREEN KEARNEY Cover Used: Film

COVER PERFORMANCE STANDARDS AS DETERMINED BY Title 14 Section 17683		
WEEKLY SCUDDER GRILL FLY COUNTS		REPRESENTATIVE FLY SPECIES
GRILL SET NO.	NO. OF FLIES OBSERVED	QUALITATIVE SAMPLING PERFORMED WITH A STANDARD INSECT NET YIELDED THE FOLLOWING SPECIES
1	0	
2	0	
3	0	
4	0	
5	0	
6	0	
7	0	
8	0	
9	0	
10	0	

DETERMINING COMPLIANCE		
Fly survey value calculated by adding the five highest grill counts and dividing by 5: 0 /5 = 0 Survey Value	Compliance is equal to a Survey Value which is less than the Threshold Value of 6	
	Compliance ☒	Non-compliance ☐

Comments: THIS IS THE FIRST SURVEY AFTER THE COVER WAS REPLACED DUE TO TEARS. OBSERVED NO FLIES TODAY, A FEW GNATS + A YELLOW JACKET WERE SEEN. THE DIRT AROUND THE COVER IS VERY DRY EXCEPT FOR THE MULCH WHICH HAS JUST A SMALL AMOUNT OF MOISTURE. THERE IS A HOLE ON THE CENTER RIGHT SIDE (FROM BOTTOM) AND CENTER LEFT SIDE W/ SOME DEBRIS EXPOSED.

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PERFORMANCE STANDARDS MONITORING FORM (FLY SURVEY)
ALTERNATE DAILY COVER

Name of Site PUENTE HILLS LANDFILL

Address 1955 Workman Mill Road, Whittier, CA 90601

Date: 8-11-04 Survey Week No. 2 Time: Start 11:15 End 12:45

Temp: 82 °F Humidity: 34 % Wind Condition: 5-5 mph Shade: 0 Sky Conditions: CLEAR

Attractants NONE Inspector: DOREEN KEARNEY Cover Used: FILM

COVER PERFORMANCE STANDARDS AS DETERMINED BY Title 14 Section 17683		
WEEKLY SCUDDER GRILL FLY COUNTS		REPRESENTATIVE FLY SPECIES
GRILL SET NO.	NO. OF FLIES OBSERVED	QUALITATIVE SAMPLING PERFORMED WITH A STANDARD INSECT NET YIELDED THE FOLLOWING SPECIES
1	0	
2	0	
3	0	
4	0	
5	0	
6	0	
7	0	
8	0	
9	0	
10	0	

DETERMINING COMPLIANCE		
Fly survey value calculated by adding the five highest grill counts and dividing by 5: 0 /5 = 0 Survey Value	Compliance is equal to a Survey Value which is less than the Threshold Value of 6	
	Compliance ☒	Non-compliance ☐

Comments: NO FLIES WERE OBSERVED TODAY ONLY A FEW GNATS. IT IS HOT + DRY AND THE DIRT + MULCH AROUND THE FILM IS VERY DRY + DUSTY. THE FILM HAS A FEW SMALL PUNCTURES, A BAG OF TRASH IS ON TOP OF THE FILM. THERE IS A TEAR ON THE RIGHT SIDE BUT SMALL THE WIND IS CAUSING THE FILM TO BLOW UP BUT NOT EXPOSE THE TRASH UNDERNEATH OR

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PERFORMANCE STANDARDS MONITORING FORM (FLY SURVEY)
ALTERNATE DAILY COVER

Name of Site PUENTE HILLS LANDFILL

Address 1955 Workman Mill Road, Whittier, CA 90601

Date: 8-18-04 Survey Week No. 3 Time: Start 11:30 am End 12:15

Temp: 86.9°F Humidity: 38 % Wind Condition: 6 SSW mph Shade: e Sky Conditions: CLEAR

Attractants NONE Inspector: DOREEN KEARNEY Cover Used: FILM

COVER PERFORMANCE STANDARDS AS DETERMINED BY Title 14 Section 17683		
WEEKLY SCUDDER GRILL FLY COUNTS		REPRESENTATIVE FLY SPECIES
GRILL SET NO.	NO. OF FLIES OBSERVED	QUALITATIVE SAMPLING PERFORMED WITH A STANDARD INSECT NET YIELDED THE FOLLOWING SPECIES
1	0	
2	0	
3	0	
4	0	
5	0	
6	0	
7	0	
8	0	
9	0	
10	0	

DETERMINING COMPLIANCE		
Fly survey value calculated by adding the five highest grill counts and dividing by 5:	Compliance is equal to a Survey Value which is less than the Threshold Value of 6	
0 / 5 = 0 Survey Value	Compliance ☒	Non-compliance ☐

Comments: TODAY SEEMED DRY + COOLER WITH A SLIGHT BREEZE. OBSERVED A FEW GNATS + ONE BEE, BUT 0 FLIES. THE FILM IS IN POOR CONDITION - THERE ARE NEW LARGE HOLES UP TO 4X3 FT. AND MANY SMALL NEW ONES. ONE AREA OF THE FILM (APROX 1/4 OF TOTAL) HAS BEEN COVERED WITH DIRT. THERE IS EXPOSED REFUSE ALONG THE NEW EDGES + NEW OPENINGS. SOME SECTIONS OF FILM HAVE BEEN REPLACED.

COUNTY OF LOS ANGELES
DEPARTMENT OF HEALTH SERVICES
Public Health

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October 15, 2004

Mr. Joe Hougton, Project Engineer
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Whittier, California 90601

INTRODUCTION

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LABORATORY

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SUMMARY

During the initial period (first five weeks) of the project covering parts of the month of July and August, no flies were observed during each weekly visit. Although no flies were observed, a few gnats and yellow-jacket wasps were seen in and around the film cover.

During the first two weekly visits, the winds were moderately strong and conditions around the site were warm and dry. Some tears were evident in the film cover and repairs to patch these were scheduled. On the third week, no flies were observed and the film cover had been repaired. In the last two weeks, the wind or possibly animals (coyotes) had caused additional tears. On the tears, dirt was placed on top to minimize additional damage.

As a result of the on-going tearing problem with the film cover, the survey project was temporarily placed on hold and will be resumed at a later date.

If you have any questions, please contact me or Doreen Kearney at (626) 430-5450.

Very truly yours,

Frank Hall, Chief

Attachments

cc: LEA-Solid Waste Management Program
Kearney

ATTACHMENT 9

ENVIRO™ COVER SYSTEM

Deployer Model 800

Enviro™ Cover Deployer Model 800 is a self-propelled applicator built on a Morooka rubber track carrier, enabling the waste-covering process to be conducted rapidly and independent of the prime movers at the landfill.

Key Features:

- Ideal for large sized cover areas / working faces
- Large ballast payload capacity container allows for continuous deployment without the downtime of ballast reloading
- Multi-direction deployment and 2-speed automatic hydrostatic transmission allows for a tight turning radius to provide increased covering efficiency and performance
- Hydrostatic transmission (hydraulic pumps), allow for economical use of the engine's full power
- Rubber tracks combine characteristics of a tire equipped carrier - smooth ride and speed, while also providing the traction of a steel type track.
- The rubber tracks offer low ground pressure, high performance movement and excellent traction, which with the floating bogie wheel undercarriage, makes even difficult terrain accessible
- CATERPILLAR controls and engine
- Variable speed hydraulic chain floor and side feeder ballast dispensing system
- Rapid deployment of cover up to 40,000 ft2 (3,700 m2) per hour
- Compatible with flowable ballast material (such as sand, soil, aggregates)

Attachment Method:

- Self-propelled

Model 800 Specification:

- Dimensions (L x WB x H):
  19 ft 7 in x 3.28 ft x 12 ft 7 in x 10 ft 4 in
  (6 m x 3.85 m x 3.15 m)
- Weight (Wet): 34,000 lbs (15,422 kg)
- Max Carrying Capacity: 16,000 lbs (7,257 kg)
- Ground Pressure:
  3.1 psi (unloaded) and 5.7 psi (loaded)

Enviro™ Cover Roll Specification:

- Thickness: 1.25, 1.75, 2, 5 mil (32, 45, 51, 127 micron)
- Roll Width: 18 ft (5.5 m)

epi
Phone: +1 (604) 738-6281
Toll free: +1 (866) 738-6281
Fax: +1 (604) 856-8189
envirocover@epi-global.com
www.envirocoversystem.com

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European Headquarters
McLintocks, Summer Lane
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United Kingdom S70 2NZ

ATTACHMENT 10

CADWALLADER TECHNICAL SERVICES

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April 6, 2014

Subject: Enviro™Cover Flammability/Combustibility

To Whom It May Concern:

Fire response in polymers and plastics, including film, is measured in various ways according to the standardized methods of various national standards organizations.

Modern polyethylene based geomembrane liners and films conform to general classification as non-flammable, though combustible. They will sustain combustion in the presence of sufficient heat, ignition, and oxygen, but they are not classified as flammable and are therefore non-hazardous materials. They have very low vapor pressures, and correspondingly high flashpoints, and must therefore be sufficiently preheated before they will ignite.

In one rating system for degree of flammability from 0 to 4, for example, with water being given a classification of 0 and natural gas a classification of 4, the polyethylene film of Enviro Cover would have a classification of no more than 1.

Mark Cadwallader

Mark Cadwallader, M.S.
Principal, CTS

Mark Cadwallader is president of Cadwallader Technical Services (CTS), providing consulting support and other services to the geosynthetics and waste-containment industries. (www.geofailures.com) . In the area of product development and waste containment, Mark has authored or co-authored over six dozen papers for technical journals and technical conferences. Mark has been a pioneer in the development and application of many advances in geosynthetics technology, including - textured sheet, white surfaced sheet, spark testable conductive liner, tri-planar geonet, various surface-modified geomembranes, concrete embedment liners, and many other aspects of geosynthetics technology. He has provided failure analysis and field CQA with recommendations for repair and oversight to numerous facilities. Mr Cadwallader has served on the board of the Industrial Fabrics Association Int, the North American Geosynthetics Society, the International Association of Geosynthetic Installers, and has led the first ASTM standards task group for landfill alternate daily cover (ADC).

ATTACHMENT 11

Enviro™ Cover System – Best Practice for Landfill Gas and Odor Control

By Mark Cadwallader, M.S

It was a typical early morning at the landfill, hardly any breeze and warm. A low lying fog rolls across the ground, its heavy moisture absorbing water-soluble, odor-bearing compounds in the fugitive emissions and taking them into the air. The foul smells were all set to greet neighbors of the site as they awoke that morning to go about their day. It would be an unwelcome reminder to those neighbors that they lived next to a “garbage dump”, not an engineered “sanitary landfill” as they were asked to believe. Such is the case every day at thousands of landfills around the world.

View of the City – New Orleans

But River Birch Landfill in New Orleans, Louisiana, USA is making that scenario a thing of the past. The landfill is using the Enviro™ Cover System for alternative daily cover, deploying a degradable polyethylene film to catch the odors on its underside and prevent their mingling with the air. The cover system of degradable plastic film also blocks the entrance of rain water, preventing the excessive generation of leachate that produces more odors from uninhibited garbage decay.

Premature generation of leachate leads to a high rate of fugitive gas and odor emissions because leachate aids in the waste degradation process. Accelerated by leachate, organic wastes decay into organic acids and other odorous compounds, many of which have very strong and foul odors.

Since River Birch started capping over its daily intake of municipal and industrial waste with the degradable plastic film, fugitive emissions from the working face have substantially decreased. This is because formation of odorous compounds is being delayed as well as contained underneath the film. Delayed development of landfill gas (LFG) from shedding of rainwater by the plastic film cover can delay gas generation until later when proper control and collection systems are installed.

Enviro™ Cover's impermeable barrier blocks gas and odors that rise with condensation as shown on the underside

The Enviro™ Cover System, an alternative daily cover material (ADCM), is intended to replace traditional daily soil cover. According to Dr. Vic Culpepper, Technical Director for River Birch Landfill, there are many benefits to using the degradable plastic film cover system.

For example, since the Landfill runs a waste-to-energy gas recovery system, it is especially important to maintain "garbage-to-garbage" contact. Leachate and gas breaks are incompatible with efficient operation of the gas-to-energy program. And because the film cover on one day becomes the active working face on another day the structural barrier between the waste and the environment is destroyed by the placement of the next layer of garbage. The film's degradability becomes important to preserve intimate contact between layers of digesting garbage - producing gas that flows freely to collection.

The degradable film ADCM not only saves valuable airspace compared with soil cover, it sheds rainwater and contains odors and LFG. And the system has also proven to yield benefits to daily operations. The Model 800 Deployer applicator is very well liked by operators. "You can go anywhere in any kind of weather with it", says Ron Buterbaugh, Landfill Operations Manager at River Birch, "and we save at least an hour or two every day placing the cover".

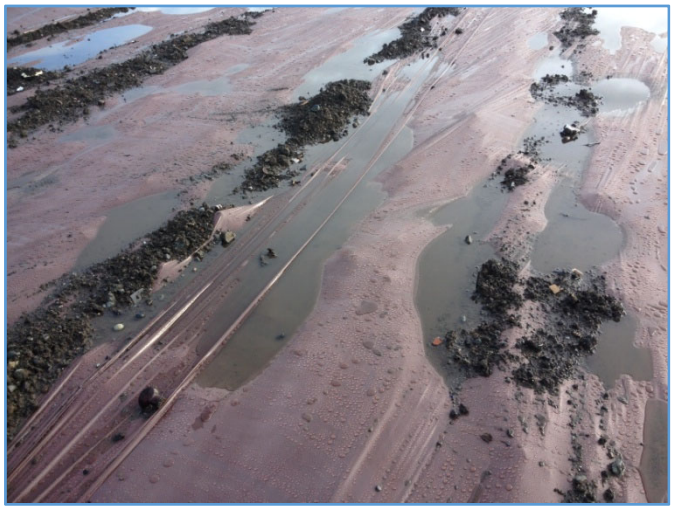
Traditional soil cover in conjunction with many municipal solid waste streams can result in the rapid build-up of odorous emissions. And because the typical approach is to come back to strip off the daily cover soil there can be a tremendous release of foul odors. Operations often return to a particular section in 3 – 4 weeks, which when stripped of cover soil for the next phase of filling releases very high levels of emissions and odors.

The Enviro™ Cover System leaves a clean face compared to soil cover which exposes waste through "flagging" from the tracks of dozers, or through repeated stripping, which entrains waste for exposure.

Conversely, the degradable film is left in place to degrade in contact with the waste for extended periods up to 4 weeks. It does not have to be stripped to provide the garbage-to-garbage contact for efficient LFG production. It simply becomes part of the waste while effectively blocking the surface infiltration of rain water and the surface exfiltration of landfill gas.

Another significant advantage reported by Dr. Culpepper is the 100% continuity of coverage with the degradable plastic film. Frequently a daily cover soil leaves openings where cohesive clayey soils "stick" to vehicle tracks and "lift" off the waste exposing it intermittently through the cover. This is called "flagging", a common problem that is typically unacceptable to regulatory oversight.

The Enviro™ Cover System, using a low ground-pressure, tracked deployer of degradable film and ballast soil, deposits a continuous soil ballast along the film panels and overlaps, leaving complete and conforming coverage of the waste. The low ground pressure and rubber tracks even allow travel onto the deployed film cover without damaging the film or barrier, an important benefit if a repair is required.



At the surface, Enviro™ Cover provides an impermeable barrier between the waste and the environment

Dr Culpepper gains operational efficiency by enlarging the film-covered surface area and maximizing the period of time before placing waste over the area. This allows for increased rainwater shedding as more plastic film surface displaces soil surface. For example, New Orleans averages 64 inches of rainfall per year. Consider that just 3 acres of film surface will shed over 5 million gallons of rainfall annually (1), enough water to fill nearly 8 Olympic swimming pools! With the film eliminating rain infiltration, LFG and odor exfiltration is likewise blocked at the surface (between the waste and the environment) where the surface has a film cover.

Being able to leave the degradable film covers in place at the Landfill leads not only to reduced rainwater intrusion, reduced emissions and odors, but to equipment cost savings. Light use of a tracked film deployment vehicle, the Model 800 Enviro™ Cover System Deployer, has displaced the use of multiple cover vehicles including off-road trucks, excavators, and bulldozers.

The Model 800 Deployer , deploying degradable plastic film while it lays down soil ballast strips for anchoring the film and sealing the overlapped panels providing complete and confirming coverage

Operational costs have been relatively low using the Enviro™ Cover System. The Deployers are designed to provide rapid, efficient and optimal coverage, capable of covering over 3000 sq. ft. per minute, both up and down working faces with slopes as steep as 3 to 1. As mentioned by Mr. Buterbaugh, film deployment is not affected by adverse site conditions and weather.

River Birch Landfill in New Orleans has been an innovator when it comes to landfill gas production and control – controlling odors, converting LFG to purified natural gas, and selling the gas to a gas pipeline. The Landfill has made innovative use of an ADCM which goes beyond the traditional benefit of air space savings. The Enviro™ Cover System provides benefits far beyond what landfill operators are accustomed to in the application of daily cover – benefits related to a much improved surface barrier that is left in place to degrade as it buries the covered waste.

Above: Large surface areas film coverage applied with the Model 800 Deployer

1) Proceedings of Global Waste Symposium, October 2012, *"Better Cover Material Selection for Improved Odor Control and Leachate Formation",* M.W. Cadwallader, Phoenix, AZ.

Appendix

EQUIVALENT DARCY'S LAW FLOW RATE FOR POLYETHYLENE CALCULATED FROM GAS TRANSMISSION DATA MEASURED IN A LABORATORY

Methane Gas Loss Through Polyethylene Film

From Matrecon Laboratories, Oakland, Calif., 1991, ASTM E96

1.25 mil, permeation = 6.1 scm/acre/day

5 mil, permeation = 3.3 scm/acre/day

vs

soil/green waste covers >> 1,000 scm/acre/day