



## Republic Services Alternative Daily Cover Pilot Program Evaluation Protocols and Performance Metrics (V1.04)

### 1. Introduction:

In November 2014, Republic Services submitted a request to conduct a pilot project at Sunshine Canyon Landfill (SCL) using a geosynthetic panel product as an alternative daily cover (ADC) in order to increase the efficiency of the landfill gas collection system and the movement of leachate through the waste mass. The primary purpose for using a geosynthetic ADC is to remove the compacted daily soil cover layers that are relatively impermeable (particularly when saturated with liquid), thereby facilitating the drainage of liquids through the bottom of the landfill into the leachate collection system, thus promoting improved transition of landfill gas to the landfill gas collection extraction wells.

The ADC, comprised of a non-reusable geosynthetic cover system consisting of a 1.75 mil thick tear-and-puncture-resistant plastic sheet (EnviroCover ADC), will be placed over the entire deck of the working face at the end of each day. The ADC will not be placed on any outside slopes but will be utilized instead of the daily placement of 9 inches of compacted soil. The SCL Local Enforcement Agency (LEA) has reviewed and approved the proposed Republic Services Alternative Daily Cover Pilot Program, (Pilot Program).

The SCL LEA's goal is to conduct a meaningful Pilot Program with sufficient time to fully demonstrate and assess near-term effectiveness of geosynthetic plastic panels as an ADC for the control of "fresh trash odors" as well as long-term effects on the control of "landfill gas odors". To this end, the Pilot Program will be in effect for a period of one (1) year in order to fully evaluate the effectiveness of the geosynthetic cover throughout seasonal changes. Republic Services shall notify the SCL LEA in writing one (1) week prior to the commencement of the Pilot Program.



Specifically, the purpose of the ADC Pilot Program is:

- To determine if the geosynthetic plastic panel ADC product meets the performance requirements of Title 27, California Code of Regulations, Section 20690 for controlling blowing litter, vectors, fires, odor and scavenging, and is as effective as the current daily cover of 9" compacted soil;
- To determine if the use of the geosynthetic plastic ADC enhances/improves the overall efficiency of the landfill gas collection system in the measurable control of landfill gas emissions from the landfill surface;
- To provide a documented technical basis to evaluate the permanent discontinued practice of applying a 9" compacted daily soil cover should the overall performance of the landfill gas collection system measurably improve and landfill gas and trash related odors reduced.

**2. SCL LEA Evaluation Protocols and Performance Metrics:**

The SCL LEA has developed a set of evaluation protocols and performance metrics that will be utilized in determining the overall effectiveness of the ADC. The primary concern of the SCL LEA is to ensure that the implementation of the ADC Pilot Program does not exacerbate the existing odor problem and that public health and safety and the environment are protected.

The SCL LEA recognizes that there are two major 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.

The geosynthetic ADC is designed to provide a complete cover over trash deposited at the working face on the day. The ADC will be required to control "fresh trash" odors emanating from the buried refuse as well as meeting other critical performance requirements of the daily soil cover (e.g., vector, etc.). The SCL LEA will perform periodic random off-hours landfill inspections as well as conduct periodic odor surveillance in

nearby communities. The SCL LEA will work collaboratively with the South Coast Air Quality Management District (SCAQMD) to monitor the community in an event that fresh trash odor complaints are received.

Landfill gas odors are typically not associated with fresh trash odor emissions through the daily cover, but are generated over time with the decomposition of older previously disposed refuse. Landfill gas odors are normally associated with surface emissions passing through the landfill's soil cover. The effectiveness of ADC in the control of landfill gas emissions and associated odors will be evaluated over an extended period of time and cannot be immediately evaluated as a reflection of the ADC performance on a daily basis.

The SCL LEA will require Republic to implement additional odor mitigation measures in the new portions of the landfill where ADC is to be utilized to improve the overall landfill gas collection efficiency.

The SCL LEA reserves the right to suspend or terminate the ADC pilot program at any time should SCL LEA determine that the ADC is not meeting the performance requirements for daily cover or that the use of the ADC is creating additional unacceptable risks to public / environmental safety and health.

## 2.1 Goals / Objectives of Evaluation Protocols and Performance Metrics:

The SCL LEA will examine the following facts in their evaluation and assessment of the performance of the ADC:

1. Number of odor complaints. SCAQMD will cooperate with the SCL LEA to timely report general information regarding odor-related air quality complaints received by the SCAQMD for which SCL is the alleged source.

During SCAQMD's normal business hours, Tuesday through Friday, 0700 hrs. to 1730 hrs., SCAQMD will, to the best of their ability, notify the appropriate Republic Service staff within one (1) hour of receipt of the first initial complaint. Republic Services will be solely responsible for advising the SCL LEA that SCAQMD has received an odor-related complaint alleging SCL as the source. Information provided by SCAQMD will include the date and time the complaint was received, complaint description, and the street and block number where the complainant is located. Because SCAQMD's primary responsibility is to respond to and investigate air quality complaints, any subsequent related complaints received after the initial complaint was received will be reported to Republic Services staff as time permits but no later than one (1) hour upon completion of SCAQMD's investigation into the odor event(s).

During non-business hours when odor-related complaints are received for which SCL is alleged as the source, SCAQMD field inspection staff, if available, are dispatched to the field when three or more complaints are received within one (1) hour. In those instances when SCAQMD staff is

deployed for odor complaint investigation purposes, SCAQMD will notify Republic Services' SCL Complaint Hotline (1,800.926.0607) within one (1) hour of arrival at the landfill.

Upon notification by the SCAQMD of an odor event(s), the SCL LEA and Republic Services staff will make every reasonable attempt to determine the source and cause of the odor.

Procedures for notification of complaints to Republic Services shall be reviewed and evaluated by SCAQMD and the LEA 30 days after implementation of the Pilot Program to determine if the notification procedures are effective in meeting Pilot Program goals and objectives. Thereafter, complaint notification procedures shall be reviewed and evaluated quarterly.

SCAQMD may, at any time, revise or terminate such complaint notifications due to resource constraints or if the notification process impedes or hinders field inspection staff from effectively performing their duties.

2. ADC inspection frequency. The ADC will be inspected for its ability to contain odors from the previous day's trash at multiple times, e.g., 1) before the start of operations; and, 2) immediately after the placement of the ADC at the end of daily operations. SCL LEA staff will schedule to do this onsite assessment as part of the daily inspectional routine.
3. Number of water-impacted wells present in 9" soil cover areas vs. the number of water-impacted wells present in ADC applied areas (where 9" of compacted soil without peel back was applied)
4. Number of water impacted wells present in 9" soil cover areas vs. the number of water impacted wells present in ADC applied areas (where 9" of compacted soil without peel back was not applied, new areas)
5. Number of water impacted wells present in 9" soil cover areas vs. the number of water impacted wells present in ADC applied areas (where 9" of compacted soil without peel back was applied and also not applied, e.g., new areas using ADC over on top of or next to where 9" of compacted soil without peel back was applied)
6. Number of landfill gas-related surface emission exceedances, the level of exceedances, and location of exceedances measured monthly for instantaneous and integrated landfill surface emission monitoring as reported quarterly in SCL's SCAQMD Rule 1150.1 quarterly reports. The SCL LEA will review surface emissions data in relation to the locations of where the ADC has been installed and where landfill lifts have been completed and are not part of the active areas. Special attention will be focused on the sloped areas of the different landfill areas.
7. Provide data on the relative volume of landfill gas being collected in the various areas, e.g., Cubic Feet per Minute (CFM), vacuum pressure, e.g., any data that can be utilized to determine

increased gas collection volumes or increased “ease” of collection, e.g., decreased vacuum pressure needed to collect the same amount (volume or increase rate) of landfill gas.

8. Periodic determination if the application of a new layer of municipal solid waste (MSW) over the ADC from the previous day releases additional fresh trash odors (from the previous day’s trash).
9. Compare the calculated overall in-place density of trash where 9” soil covered (without peel back) was installed vs. the ADC applied areas (where 9” of compacted soil was **not** applied), and comparing the permeability (e.g., ease of movement of the gas to the landfill gas extraction wells (using the U. S. EPA LandGEM model and or other models to determine effective radius of influence).
10. Compare actual in place measurement of liquids (moisture content) in 9” soil covered areas(without peel back) vs. moisture content in ADC installed areas (where 9” of compacted soil without peel back was **not** applied, e.g., new areas with ADC only)
11. Monitor the level of ADC destruction after the dozer 1) pushes the trash onto the liner, and 2) after the dozer compacts newly disposed trash on the ADC. The SCL LEA may request that a controlled area (away from the immediate working face area) be set aside for this test. This will determine whether the 1.75 mil thickness is sufficiently “durable” for its intended purpose (meeting the criteria established in Title 27 Section 20690).

## 2.2 Other Test the May be Requested by SCL LEA:

1. Use of odorant (trace tracking specific) to be applied at the end of each day of refuse disposal before covering with ADC. SCL LEA staff to assess the performance of the ADC by determining if they can detect the tracking odor after the application of the ADC. A control standard using the 9” of compacted daily soil can also be utilized.
2. The SCL LEA may also request testing the use of ADC as part of a layered intermediate cover to decrease the overall permeability of the intermediate cover.

## 3. SCL LEA Pilot Program Requirements:

Public health and safety and the protection of the environment are the paramount objectives of the SCL LEA operations. As part of the ADC Pilot Program, the SCL LEA requires certain operations procedures and reporting procedures to be implemented.

The SCL LEA will continue to research best management practices and successful case studies in landfill gas odor reduction during this pilot program. The SCL LEA reserves the right, at any time, to modify and or implement additional requirements to the Pilot Program.

### 3.1 SCL LEA Required Operational Procedures:

1. The SCL LEA requires that a three foot (3') minimum thickness of trash be pushed onto the ADC and maintained on the ADC before a compactor is allowed to travel over the trash. This is to maintain an adequate "layer" of material to prevent odors underneath the ADC from escaping as it is being punctured or torn from the weight of the dozer. A thicker layer may be required if the three foot layer is not adequate in preventing the odors from escaping. (Note: the SCL LEA acknowledges that it may be difficult to determine whether potential odors at the working face are in fact coming from the trash underneath the ADC.) The SCL attempt to determine if there is a "significant increase" in odors, or a "change in the characteristic" of the odor when the fresh refuse is pushed onto and/or compacted by the compactor.
2. The landfill working face area will be inspected daily by Republic Services site personnel and on-site LEA personnel for vectors, fires, blowing litter, scavenging, and odors prior to the start of landfilling operations.
3. The two weather stations located at SCL shall collect weather information on a continuous basis including temperature, humidity, wind speed, wind direction and precipitation.
4. Daily monitoring reports and weather information will be provided to the SCL LEA on a monthly basis or as needed during odor events.
5. Keep records / documentation on the amount of ADC material used and a calculated equivalent amount of compacted daily soil that was replaced by the use of the ADC (use a documented average thickness of daily soil cover for this calculation).

### 3.2 SCL LEA Reporting Requirements:

Reports will include:

1. Any immediate odors detected at the vicinity of the working face during and after the application of the ADC on a daily basis to on-site SCL LEA personnel
2. On a daily basis, report and document any unusual and or "special occurrences" at the working face such as fire, vectors, blowing litter and scavenging.
3. All monitoring observations, including daily logs, shall be submitted on a monthly basis.
4. Amount (square feet) of ADC utilized shall be reported on a monthly basis.

5. Amount of soil (in cubic yards and in tons) conserved by the use of the ADC on a monthly basis.
6. Any maintenance issues related to the equipment used for the Pilot Program shall be documented and reported on a monthly basis and of how the issue was addressed/corrected.
7. Reports of any tears, punctures or unusual observations related to the installation of the ADC and how addressed/corrected on a monthly basis (report daily if occurrence becomes an operational issue).
8. The daily weather information collected from the site's weather stations shall be reported on a monthly basis.
9. Provide the SCL LEA documentation on the calculated equivalent amount of compacted daily soil that was replaced by the use of the ADC shall be reported on a quarterly basis (use a documented average thickness of daily soil cover for this calculation).
10. SCL LEA shall be notified in writing one week prior to the start of the Pilot Program.

As previously stated, the SCL LEA reserves the right to terminate the ADC Pilot Program at any time should the SCL LEA determine that the ADC is not meeting the performance standards for daily cover or that the use of the ADC is creating additional unacceptable risks to public health and safety and/or environment.

Please contact the following if there are questions or comments:

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