Sunshine Canyon Landfill Local Enforcement Agency

SCL LEA Progress Report on April 2, 2015 Board Motion

December 2015

SUNSHINE CANYON LANDFILL

SCL - LEA

LOCAL ENFORCEMENT AGENCY

Nowland “Skip” Bambard, Board of Directors
1945 - 2015

We will miss you..!

Action Item #1 – Direct the SCL LEA Program Manager, upon completion of the review of both SCAQMD consultants' reports, to provide the Board members with a report of the SCL LEA recommendations along with the technical backup, documentation and reasoning for those recommendations.

- Completed review of SCAQMD Hydro Geo Chem report and Yazdani report SCL LEA reviewing Yazdani report
- SCAQMD to provide summary of findings
- SCL LEA compiled a comprehensive list of potential programs and actions for odor mitigation at the landfill (document will be a continually updated technical document)
  - Available on SCL LEA Website

Overview of SCL LEA "Compilation" and Recommendations

- Implement plastic ADC
  - Pilot Program began October 12, 2015
- Implement "Peel Back" of Soil
  - SCL LEA evaluating proposal
- Now focus on "Intermediate Cover"
  - SCL LEA believes this to be critical for improving LFG collection system

Sunshine Canyon Landfill
Local Enforcement Agency

Technical / Regulatory Basis for SCL LEA Recommendations / Actions

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Basis of SCL LEA Recommendations

- Extensive independent SCL LEA research / analysis
  - Supporting documentation and references
  - Provided to Interagency Task Force
  - Publically accessible

    www.dropbox.com/sh/nm5341eupq7dxj5/AAA42v6IZFt-CGYQdFfflfqta?oref=e&n=88965574
- Summary of Analysis / Recommendation
  - SCL LEA “Compilation of Potential Mitigation Practices and Programs”

Basis of SCL LEA Recommendations

- Regulatory agency/industry recognition to beneficial use of ADC over the last 30 years
- SCAQMD consultant reports recommend use of plastic ADC
  - HGC Report (Field Testing Evaluation of LFG System)
  - Yazdani Report (Independent review of HGC report and supplemental recommendations)
- SCL LEA survey of landfills utilizing EnviroCover show beneficial reduction of odors and improvements to LFG and leachate collection

Landfills Contacted about EnviroCover

Currently use the EPI EnviroCover:

- River Birch Landfill, Louisiana (Active)
- Catawaba County Landfill, North Carolina (Active)
- Fresno County Landfill, California (Active)
- Mauritius Landfill, Mauritius (Active)

Discontinued Use of EPI EnviroCover:

- Puente Hills Landfill (Closed)
- Whitfield Westside Landfill, GA (Active)
- East Calgary Landfill, Canada (Active)

Overall Findings about EnviroCover

- None of the landfills contacted experienced odor problems due to the use of EnviroCover.
- None of the landfills contacted experienced any negative impact with their gas collection systems. River Birch LF thinks their gas collection system did improved.
- None of the landfills contacted experience any negative impact with their leachate collection system. Mauritius landfill said their leachate collection system improved with the installations of the EnviroCover.
- Most of the landfills contacted experienced a slight difficulty applying the film during high wind conditions. The landfills suggested/recommended to operate slowly.
- All of the landfills saved time covering daily trash.

Basis of SCL LEA Recommendations (continued)

Examples of Regulatory/Industry Changes

- U.S. EPA, Assessment and Recommendations for Improving the Performance of Waste Containment Systems (2002)
- Solid Waste Landfill Engineering and Design, Mc Bean, Rovers, and Farquhar, 1995 (ISBN 0-13-079187-3) Prentice-Hall, Simon & Schuster Company
- CalRecycle Best Management Practices
  - Technologies and Management Options for Reducing Greenhouse Gas Emissions From Landfills" (2008)

Basis of SCL LEA Recommendations (continued)

Examples of Regulatory/Industry Changes

- SWANA, Manager of Landfill Operations (MOLO) Training 2010
- Republic Consultant's Reports
  - Brown and Caldwell
  - Cornerstone Environmental Group
  - Bryan A. Stirrat and Associates
  - A-Mehr Inc.
- Blue Ridge Services White Paper
  - N. Boulton (Taught CalRecycle's ADC Course)

  http://www.calrecycle.ca.gov/lea/training/ADC/2003AprJun/default.htm

Review of EPA Historical Documents

- Sanitary Landfill Bibliography

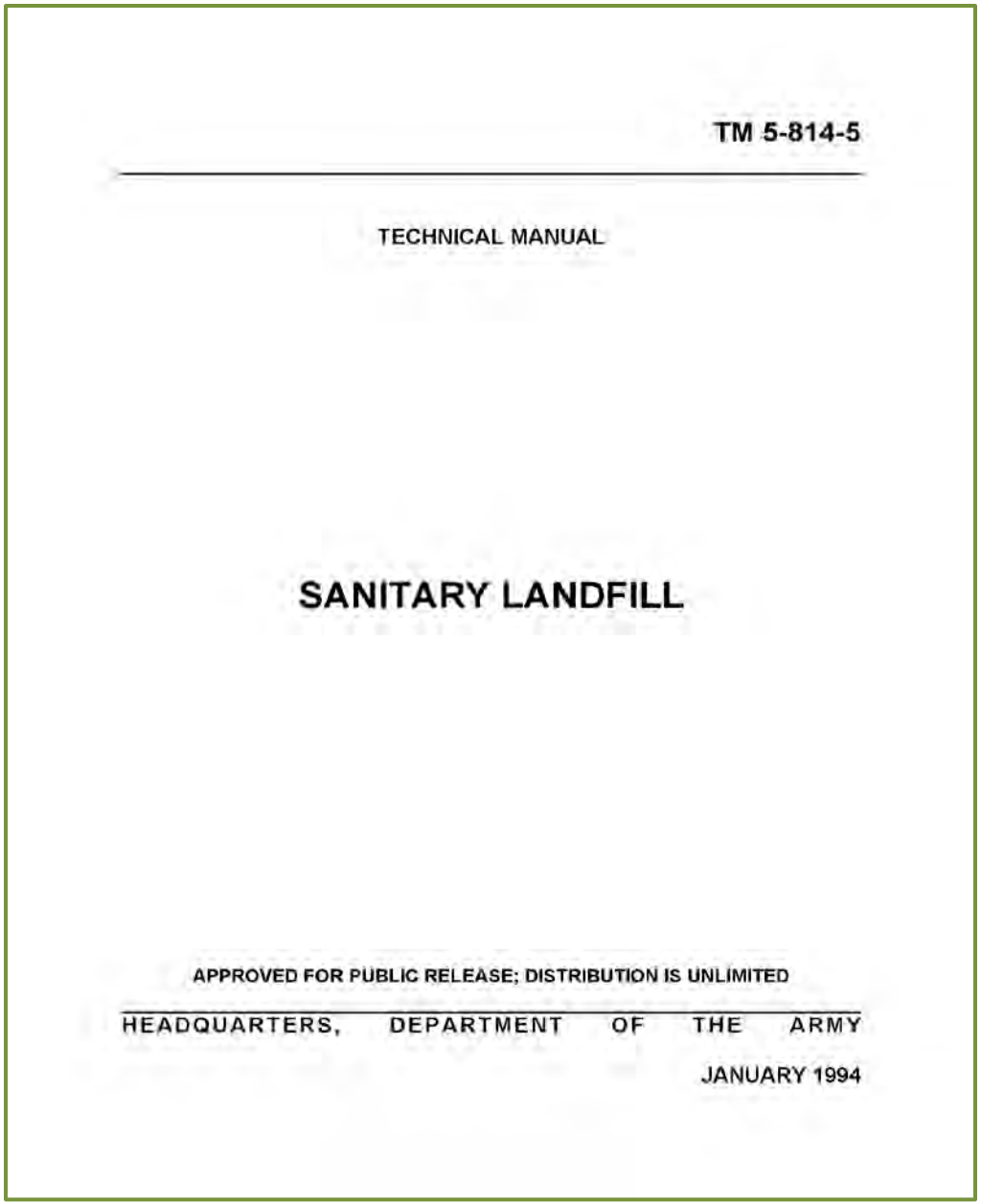
http://nepis.epa.gov/Exe/ZyPDF.cgi/9100MSFE.PDF?Dockey=9100MSFE.PDF
Public Health Service Publication # 1819 (from 1929 to 1971)

- Sanitary Landfill Facts

http://nepis.epa.gov/Exe/ZyPDF.cgi/2000PYEV.PDF?Dockey=2000PYEV.PDF

- **Effect of Earth Cover on Housefly Emergence**, Black, R. J., and A. M. Barnes, Public Works, 87(3): Page 109 – 111, March 1956
  - 7.5 cm to 15.0 cm (3" – 6" of compacted soil prevents fly larvae emergence)
  - Most referenced document for 6" of soil cover to control flies

US Army Technical Manual (TM5-814-5) 1994



TM 5-814-5

TECHNICAL MANUAL

SANITARY LANDFILL

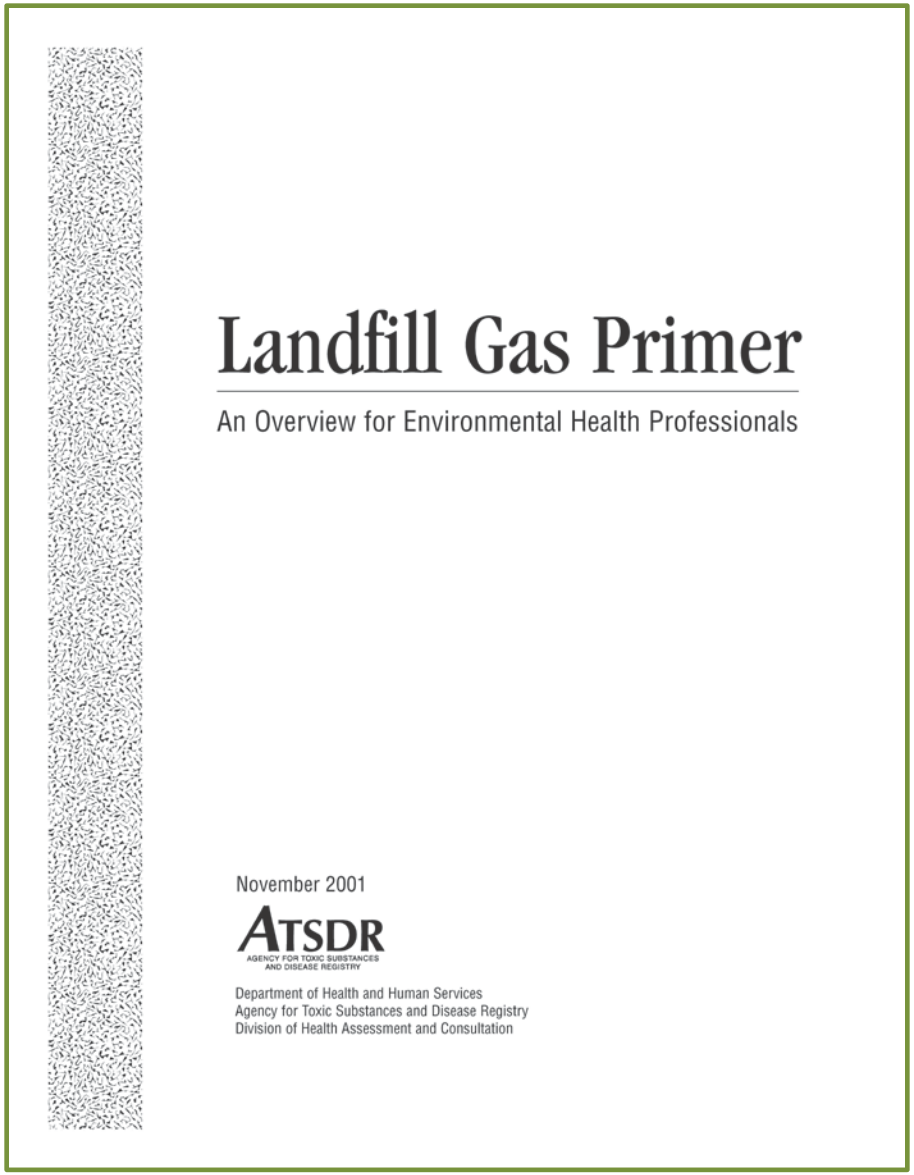
APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED

HEADQUARTERS, DEPARTMENT OF THE ARMY

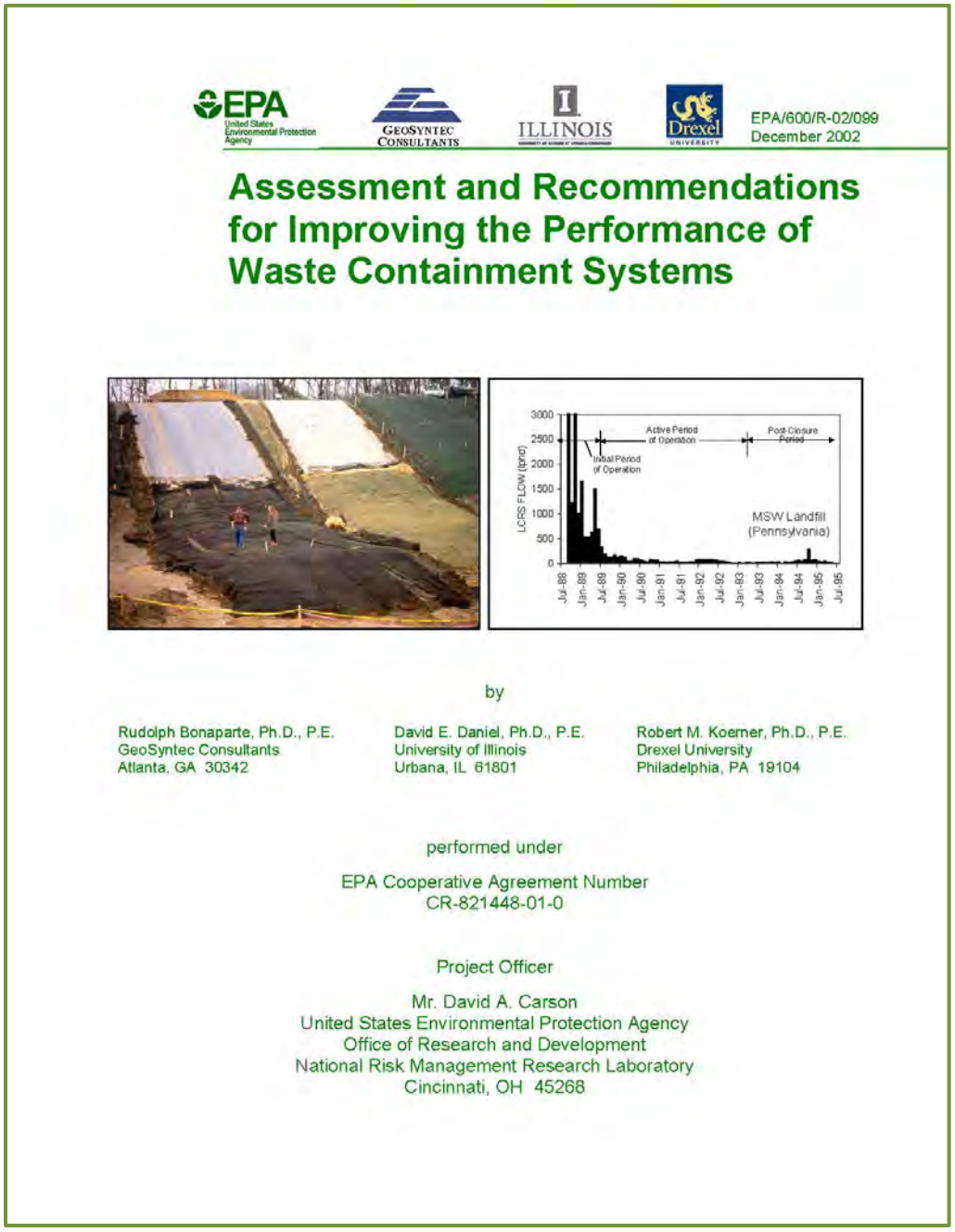
JANUARY 1994

The daily soil cover may inhibit gas movement and interaction, and create pockets of gas which restrict gas collection.

Agency for Toxic Substances & Disease Registry: Landfill Gas Primer – An Overview for Environmental Health Professionals (2001)



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…



EPA/600/R-02/099
December 2002

Assessment and Recommendations for Improving the Performance of Waste Containment Systems

by

Rudolph Bonaparte, Ph.D., P.E.
GeoSyntec Consultants
Atlanta, GA 30342

David E. Daniel, Ph.D., P.E.
University of Illinois
Urbana, IL 61801

Robert M. Koerner, Ph.D., P.E.
Drexel University
Philadelphia, PA 19104

performed under

EPA Cooperative Agreement Number
CR-821448-01-0

Project Officer

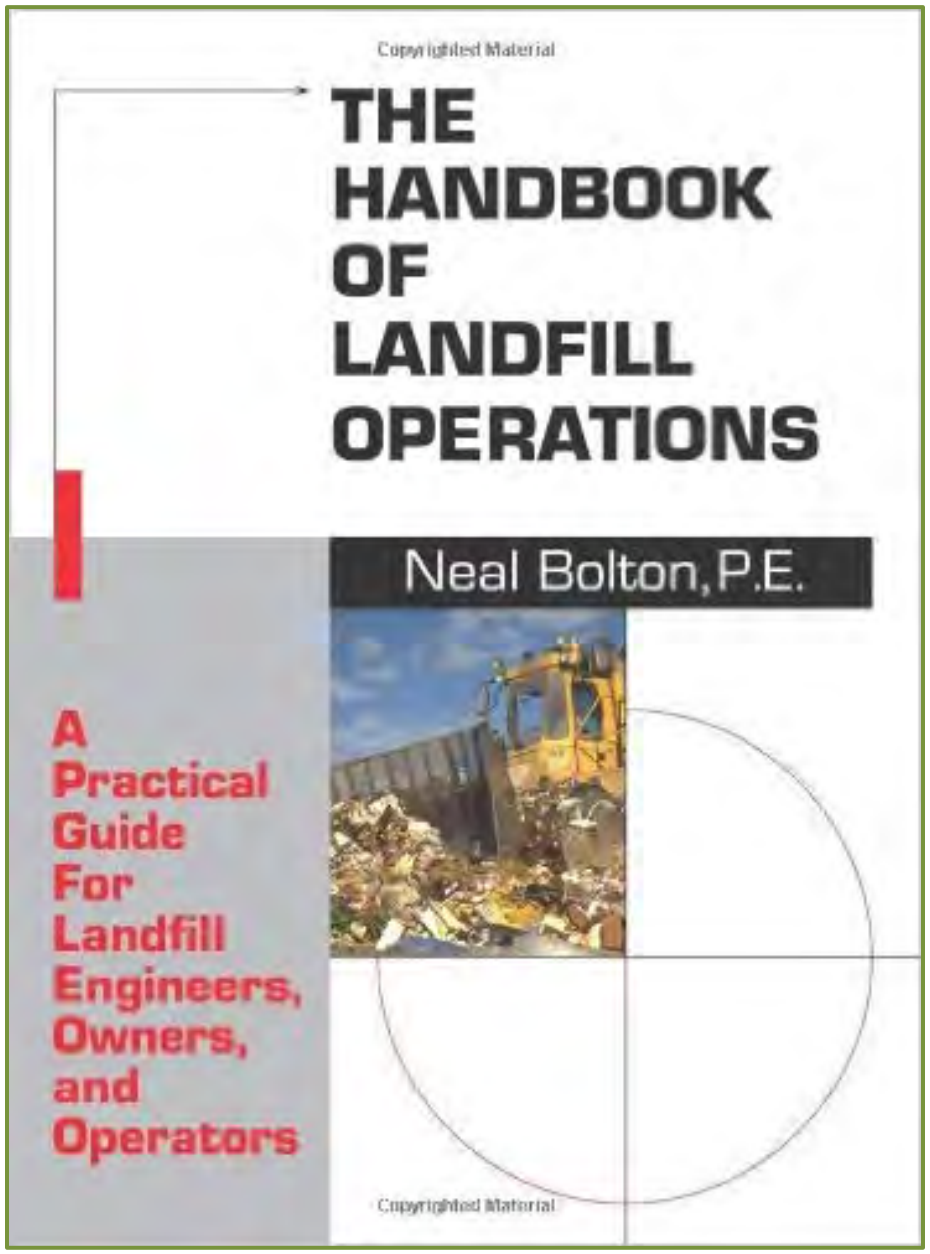
Mr. David A. Carson
United States Environmental Protection Agency
Office of Research and Development
National Risk Management Research Laboratory
Cincinnati, OH 45268

U.S. EPA (2002)

6.3.3 Perched Leachate

Perched leachate (which does not have full hydraulic connection to the underlying LCRS) can occur as a result of a number of conditions in a landfill. Excessively clogged filters above the drainage layer, low-permeability buffer (or protection) soils placed above the LCRS, **low-permeability daily cover**, and high moisture content sludges (industrial or sewage) within the waste mass all can lead to the trapping of moisture in pockets within the waste. The perched leachate can increase the unit weight of the waste and impact waste stability. **Saturated conditions within the zone of perched leachate will inhibit the generation of landfill gas and reduce the effectiveness of gas extraction wells in the area.** In addition, **the "breakout" of perched leachate as seeps** has contaminated nearby surface waters, created odor problems, and killed vegetation.

The Handbook of Landfill Operations (1995)



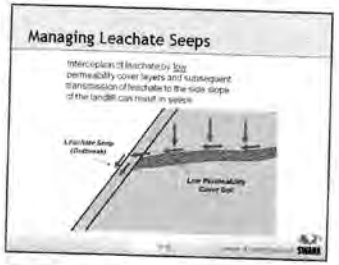
"…Prior to placing each day's garbage, it is usually best to strip all the available soil from the footprint…"

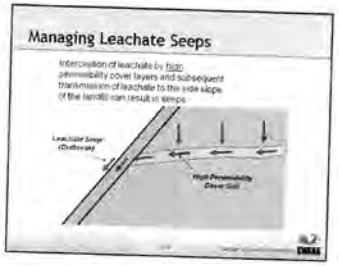
Manager of Landfill Operations (MOLO) 2010 Textbook

MANAGING LEACHATE SEEPS

Seeps typically appear as wet spots on the side of the landfill and they often discolor the surface. They sometimes have a very strong odor and attract insects. They can lead to contamination of stormwater and offside migration of leachate if not effectively controlled.

Leachate seeps result for a number of different reasons. The slide on the right illustrates how a low permeability cover soil layer (or waste layer or ash layer) can result in preferential flow of leachate to the side slope of the landfill. This can be avoided by sloping soil layers near landfill edge inwards, avoiding low permeability cover soils, or removing soil during waste placement.





The above slide illustrates how a highly permeable cover soil layer can result in preferential flow of leachate to the side slope of the landfill. Similar techniques as used for low permeability soil layers can be used.

It is important for the landfill operator to understand that side slope seeps can also occur as a result of water traveling on top of the waste on the side slope through the intermediate cover. This is a common observation at landfills which use mulch as cover material on the outer slopes of landfill.

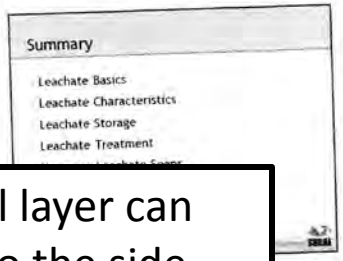
Control of surface discharge is accomplished by:

a) Controlling leachate generation
b) Excavating the area around the "seep," collecting leachate and diverting it to a collection system or fill with well-compacted, fine-textured soil to divert leachate back into fill.

The generation of leachate seeps can be controlled by minimizing those conditions described on the previous slides. However, leachate seep may occur at even the most well operated facilities. A seep management plan should be included as part of the site operating plan.

SUMMARY

Management of leachate is one of the major responsibilities that the MOLO will be faced with at modern landfills. The MOLO should have a sound understanding of what leachate is and why it is a concern, how it is collected, and how it can be safely and effectively managed.



LESSON 10

Low permeability cover soil layer can result in preferential flow to the side slope of the landfill. This can be avoided by sloping soil layers near landfill edge inwards, avoiding low permeability cover soils, or removing soil during waste placement.

CalRecycle LEA and Facility Operator Training
Alternative Daily Cover (ADC) 2003

So First, Let's Talk About Daily Cover

Daily cover…

- Is required
- Must be 6 inch minimum
- Must be applied daily

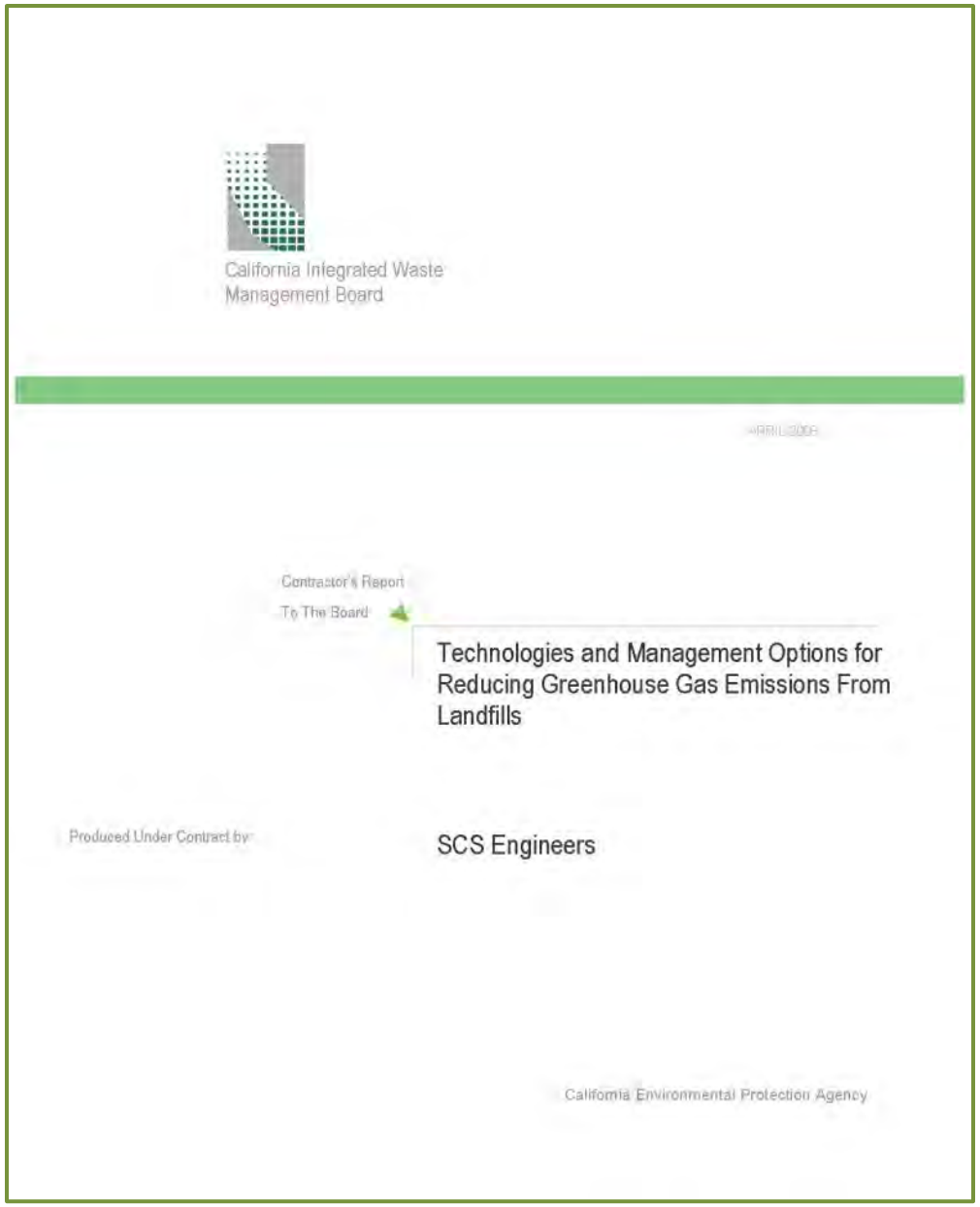
It's Required

Subtitle D sets the standard by recommending that 6 inches of soil be used as cover soil.

Must be 6 inches of material…minimum

This is based on actual tests done to determine the minimum depth of soil that would prevent fly larvae from emerging

Technologies and Management Options for Reducing Greenhouse Gas Emissions from Landfills (CalRecycle, 2008)



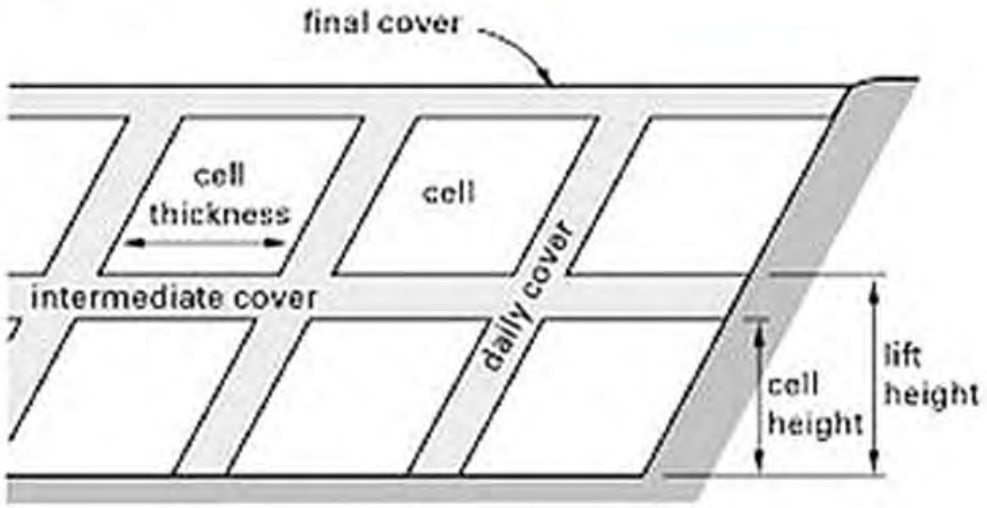
Because there are many layers of daily cover within a landfill, low permeability daily cover material can actually become a direct impediment to gas collection by preventing adequate vacuum distribution and coverage in the waste.

Basis of SCL LEA Recommendation (continued)

Examples of Regulatory/Industry Changes

Mechanical Engineering Reference Manual for the PE Exam, 13th Edition, M. Lindeburg, PE

Figure 68.3 *Landfill Cells*



The *cell height* is typically taken as 8 ft (2.4 m) for design studies, although it can actually be much higher. The height should be chosen to minimize the cover material requirement consistent with the regulatory requirements. Cell slopes will be less than 40°, and typically less than 30°.

WHITE PAPER: Assessment of Alternative Daily Cover Related to Origin and Control of Landfill Odor (Boulton 2012)

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.**

SCL LEA Technical Methodology

Multidisciplinary System Approach:

- Public Health/Environmental Health
- Legal/Regulatory
- Fluid Dynamics/Hydrology
- Landfill Gas Modeling
- Waste Characterization Study
  - Physical and Chemical Property of Solid Waste
    - Moisture Content
    - Biological Methane Potential, etc.
- Air Emission Monitoring
- Soil Property Mechanics
- Geotechnical Analysis
- Geographic Information System (GIS)

Sunshine Canyon Landfill
Local Enforcement Agency

Detailed Example of SCL LEA Data Analysis and Reasoning

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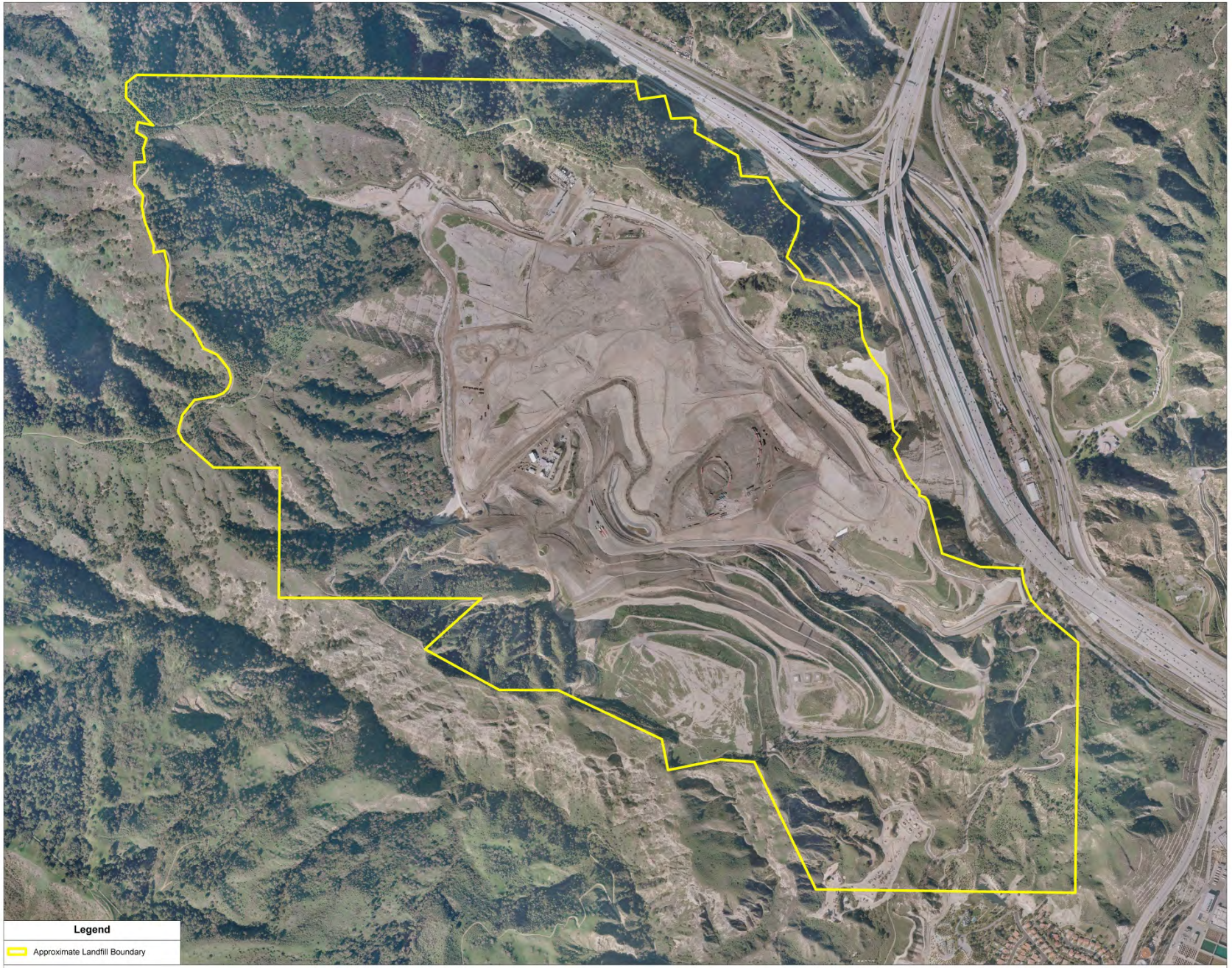
Example of SCL LEA Analysis

- SCL LEA “cross referencing” documents from landfill operators and various regulatory agencies
  - Gas Well locations (e.g., water impacted wells)
  - Location where 9” daily soil cover was used
  - SCAQMD Rule 1150.1 Quarterly Reports
    - Surface emissions data / reports
  - Conducting Field Testing (e.g., Visqueen Testing)
- Integrating data/analysis (“Data Mining”)



REPUBLIC SERVICES

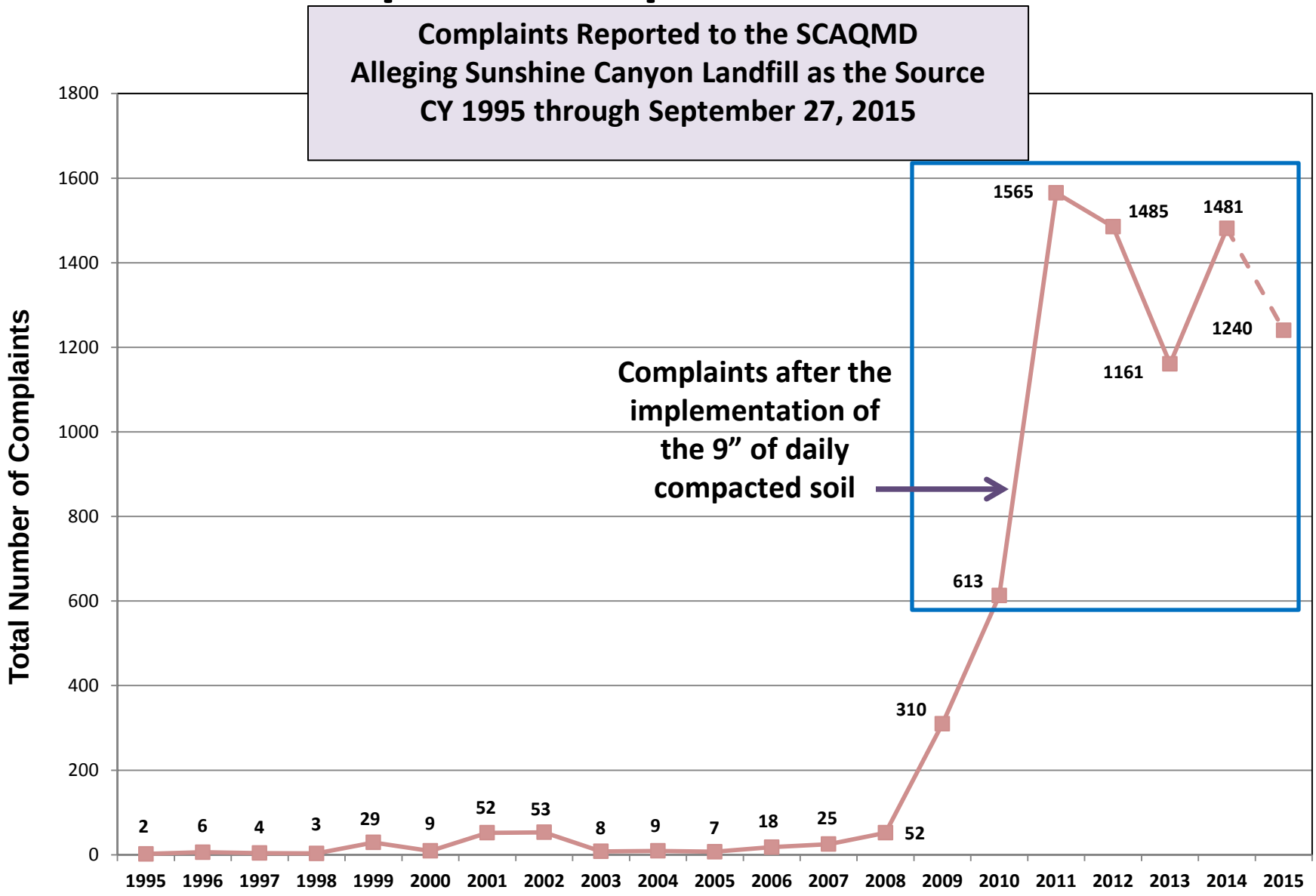
Sunshine Canyon Landfill

0 300 600 1200 Feet

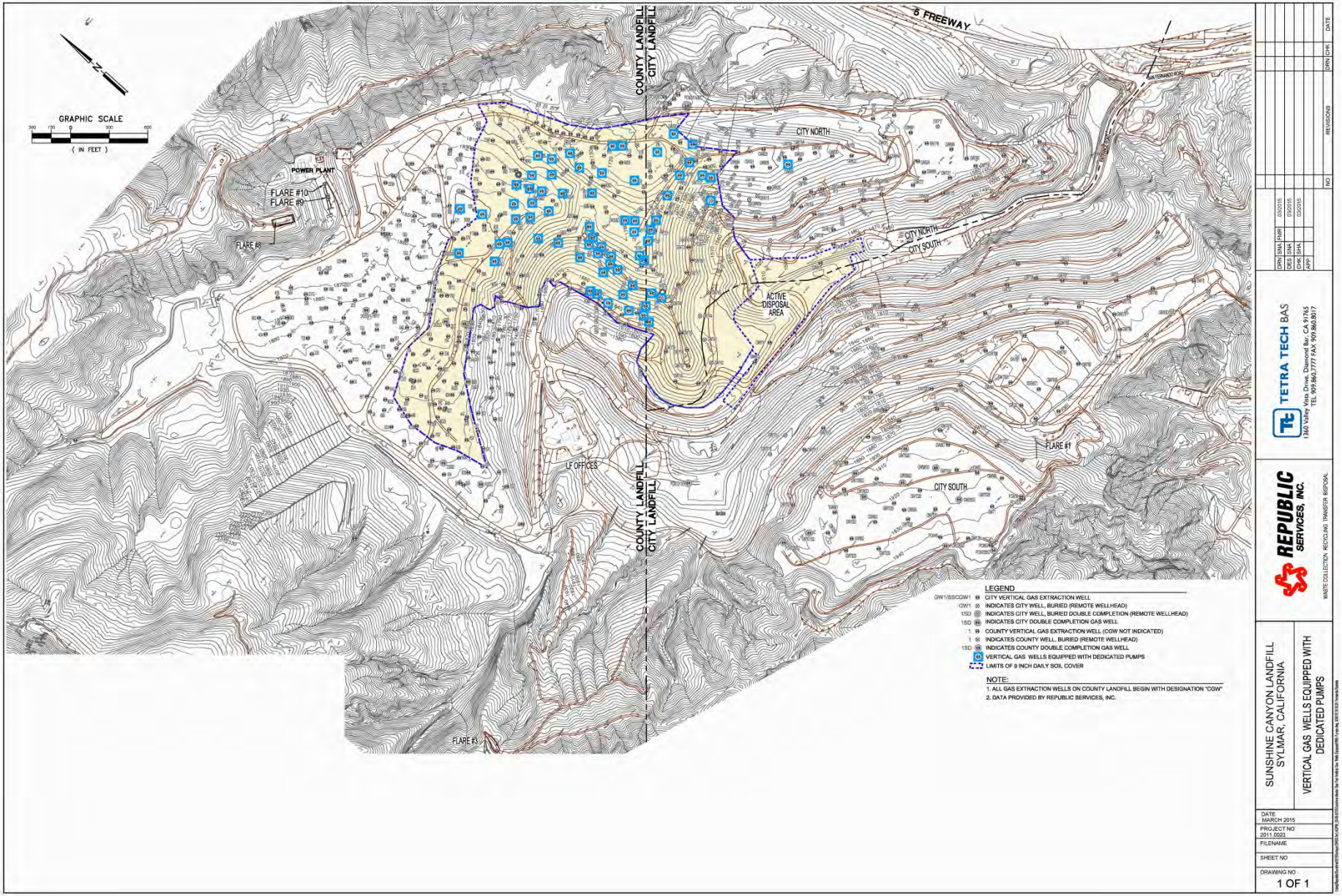
Date of Photography: February 9, 2015

N W E S

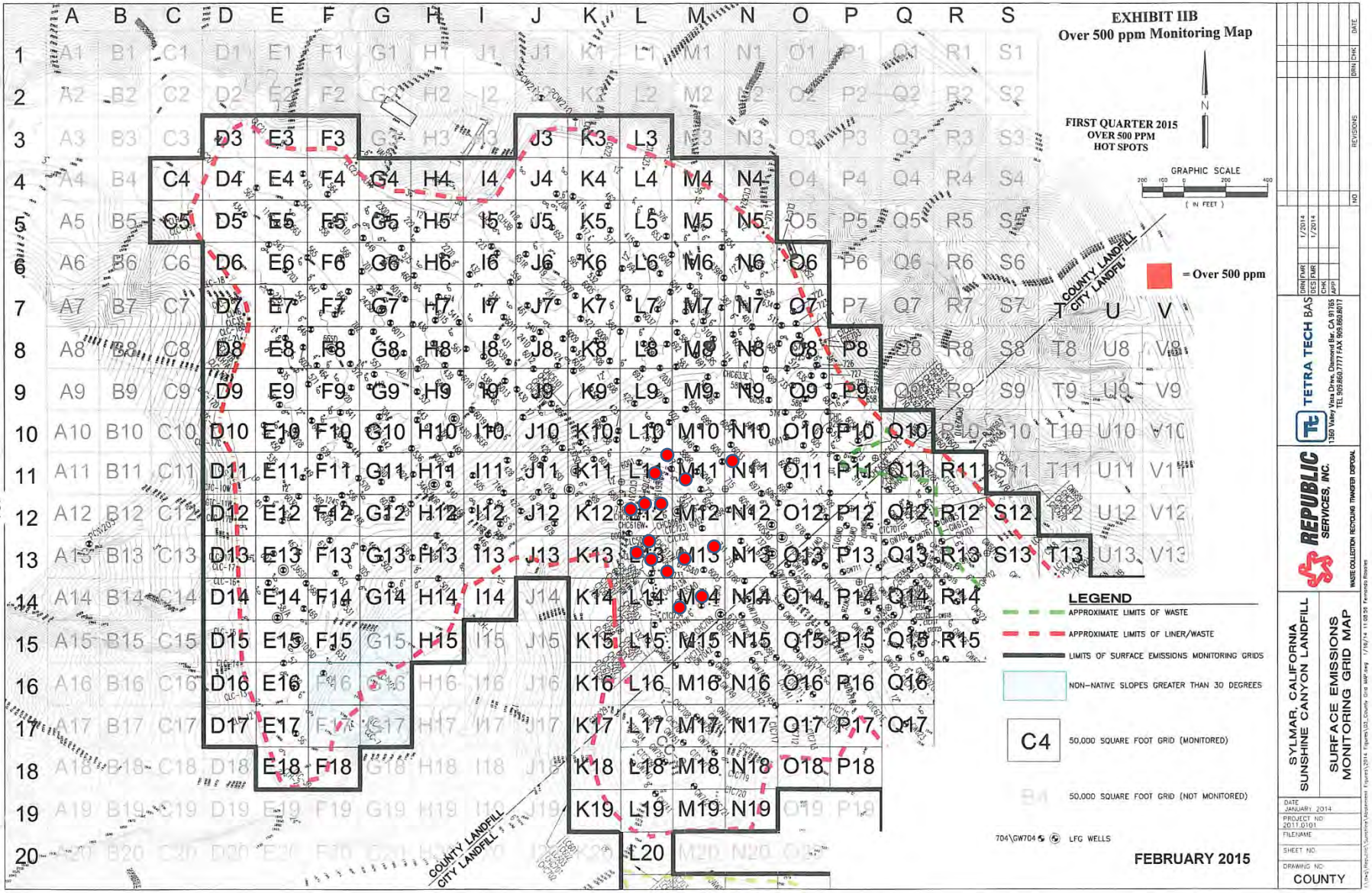
Odor Complaints Reported to the SCAQMD



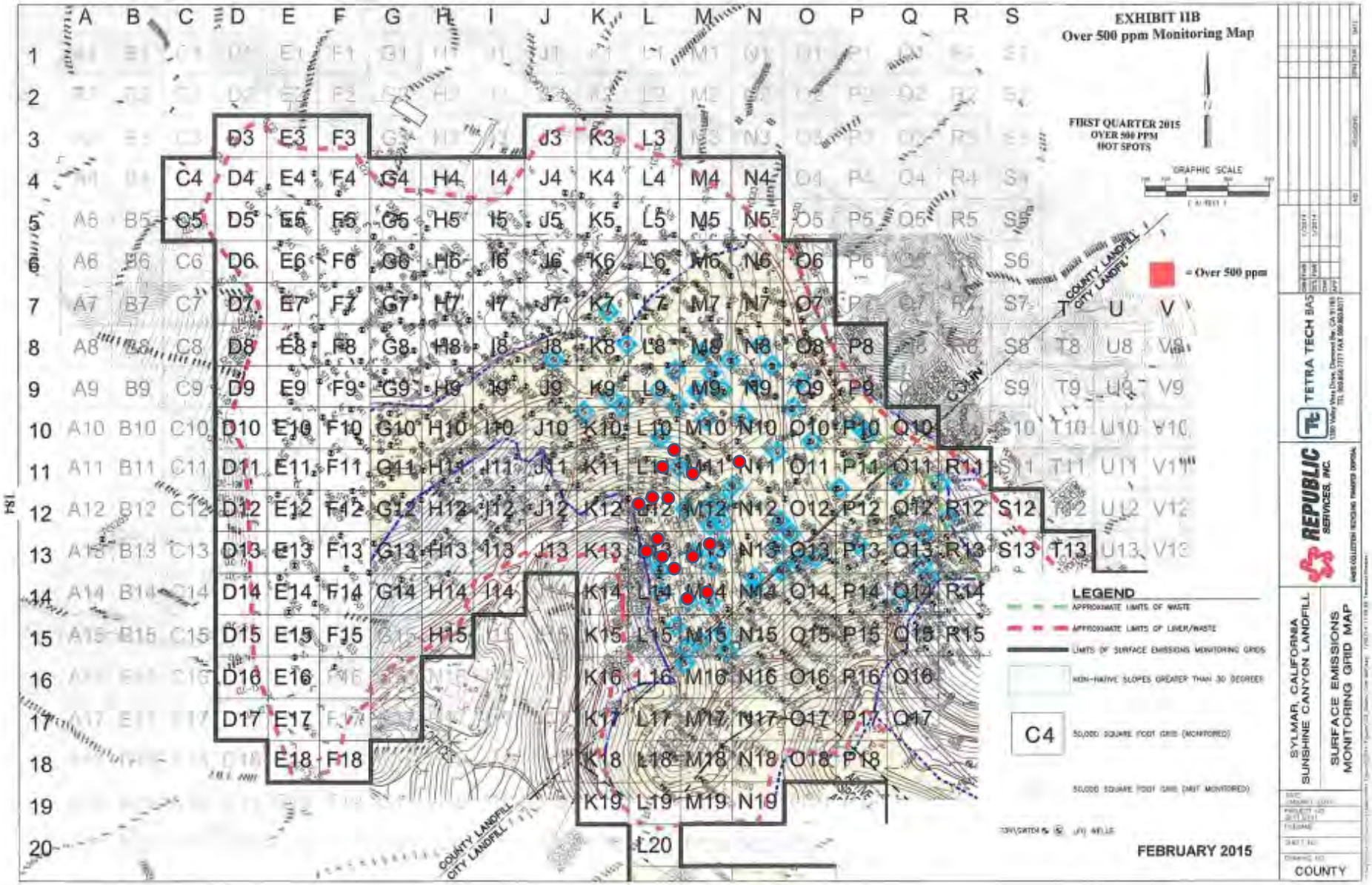
Impacted Gas Extraction Well Locations (March 2015)



SCAQMD Rule 1150.1 Report (February 2015)

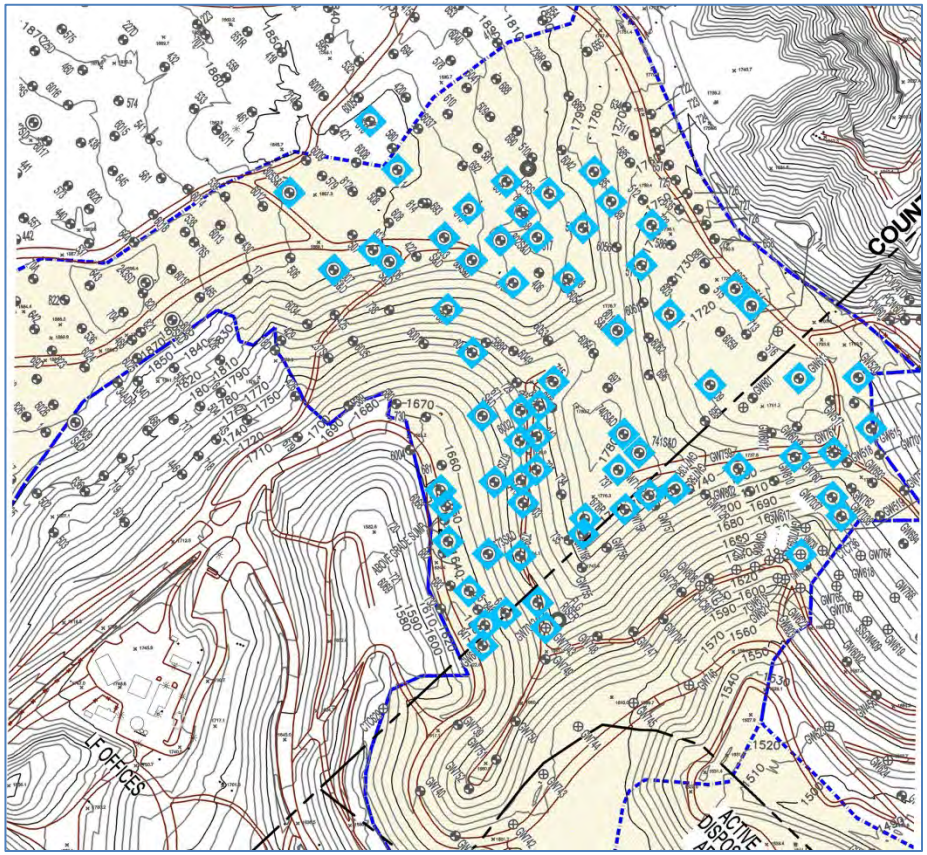


SCL LEA Composite Overlay Analysis: February 2015



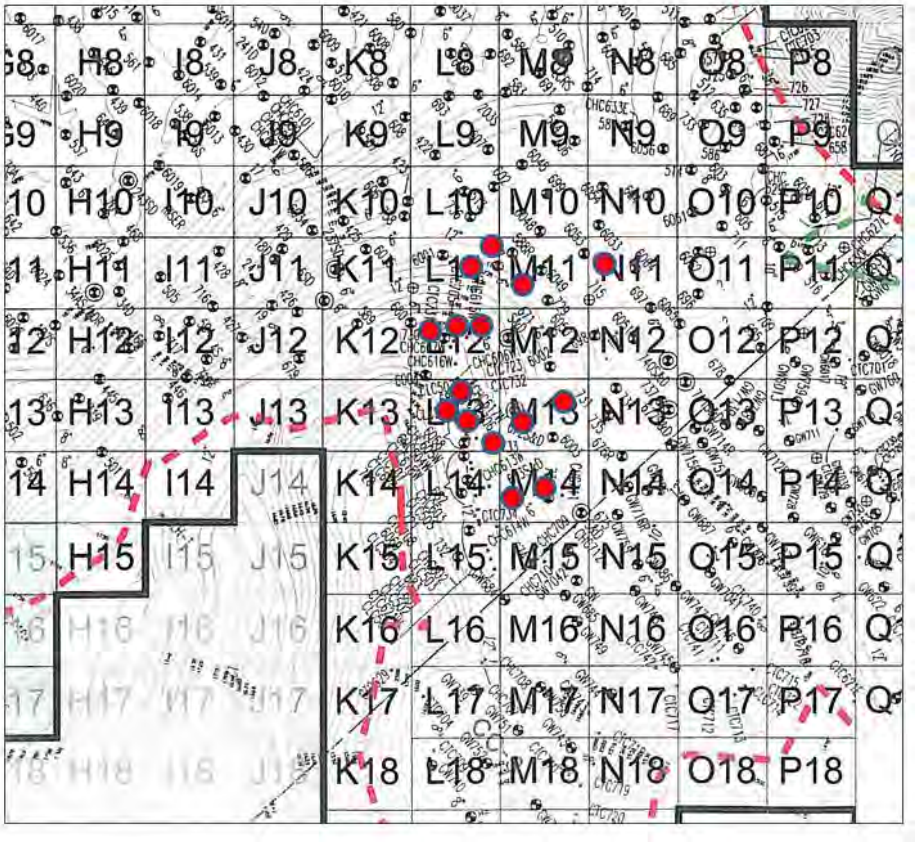
SCL LEA Composite Overlay Analysis

Water Impacted Wells



March 2015

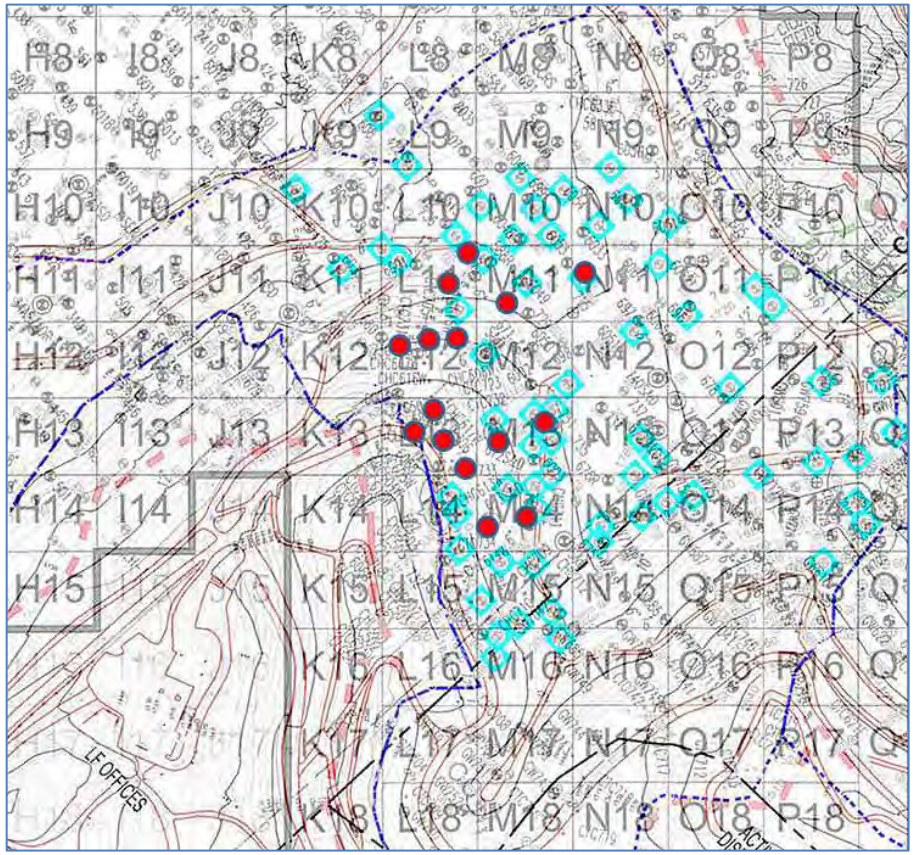
Surface Emissions >500 ppm



SCAQMD Rule 1150.1 Report (February 2015)

SCL LEA Composite Overlay Analysis

Overlay: Exceedances on Wells

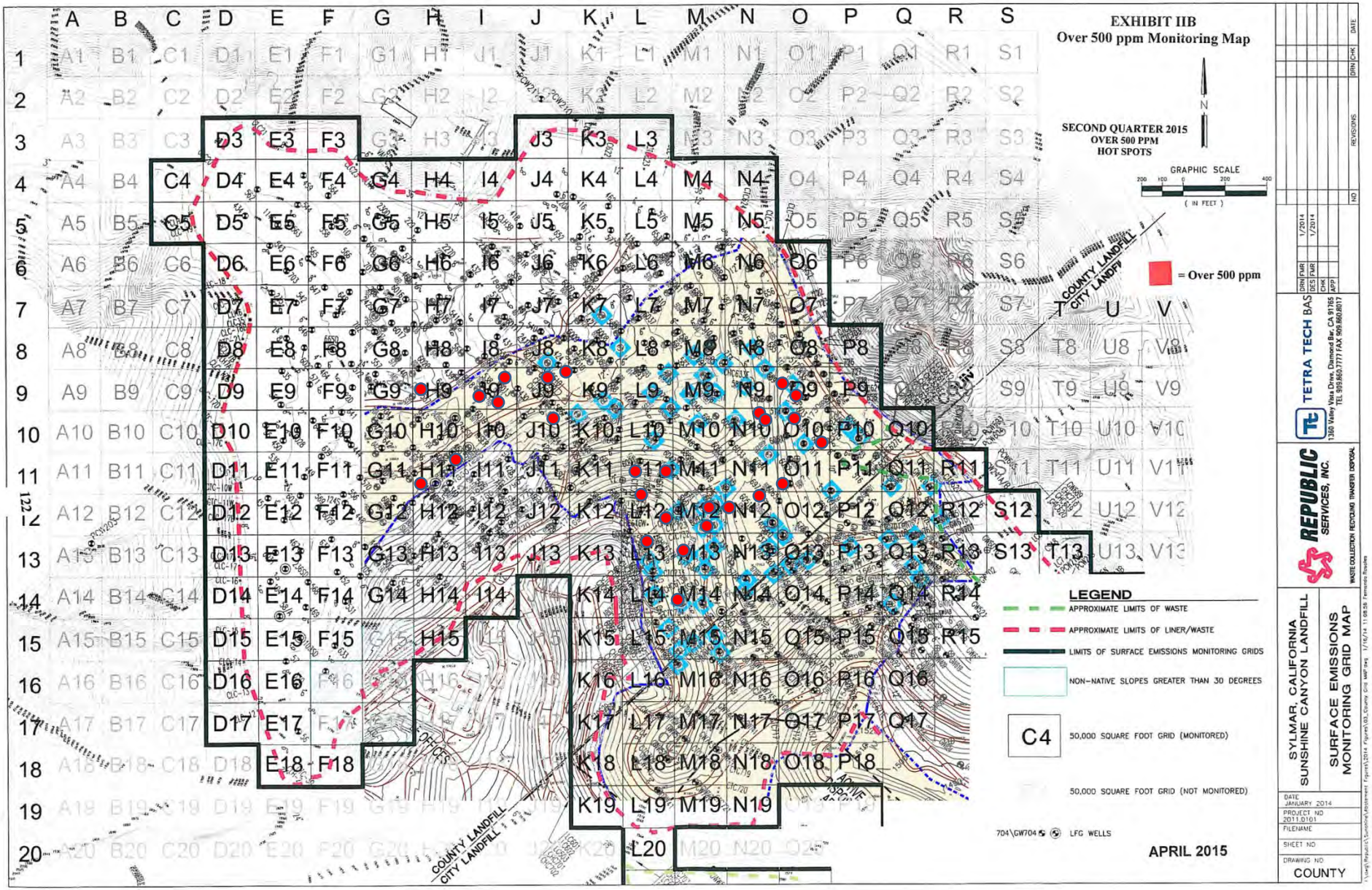


SCAQMD Rule 1150.1 Report (February 2015)

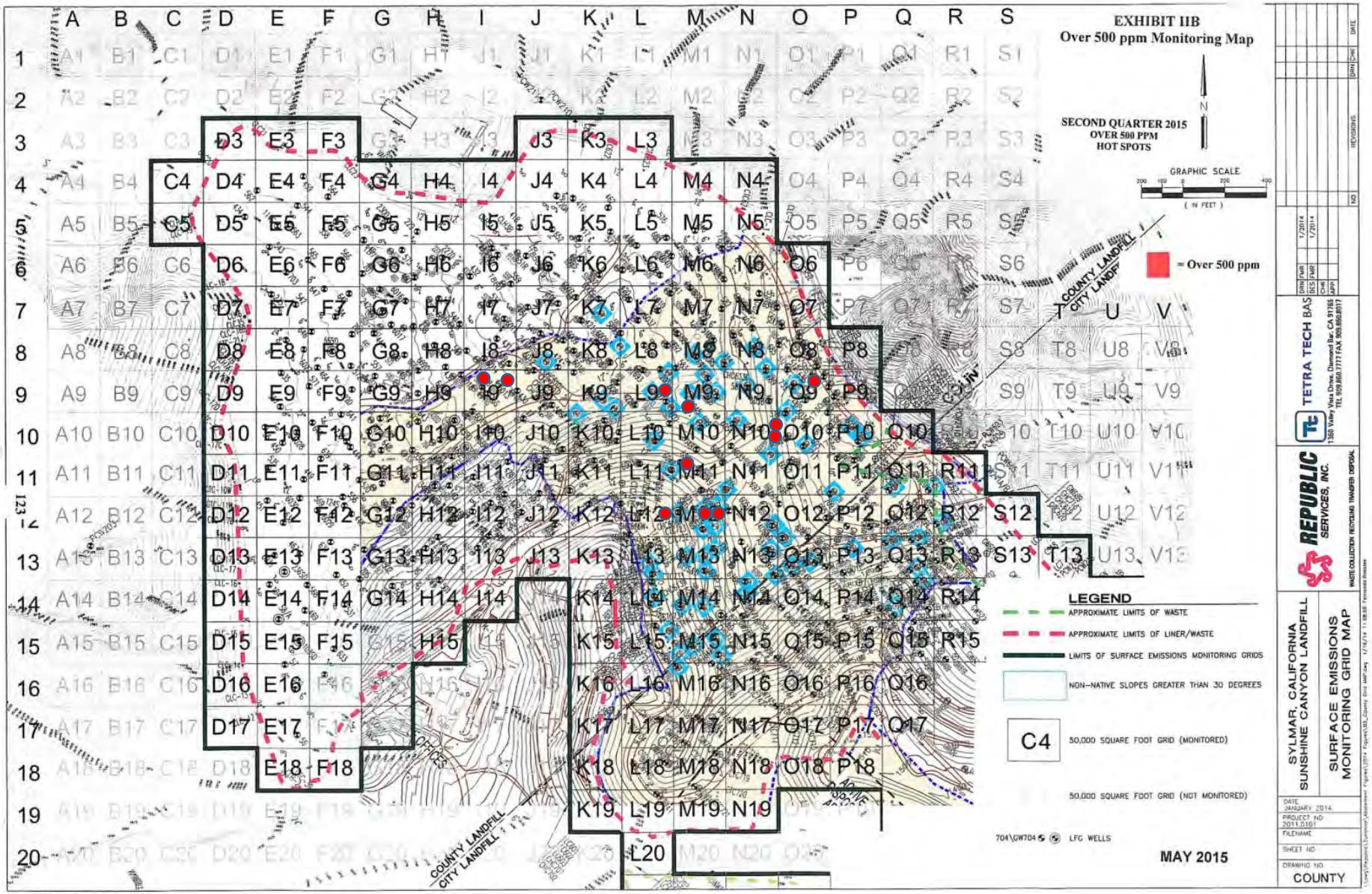
Overlay on Aerial Photo

Sunshine Canyon Landfill Aerial (2015)

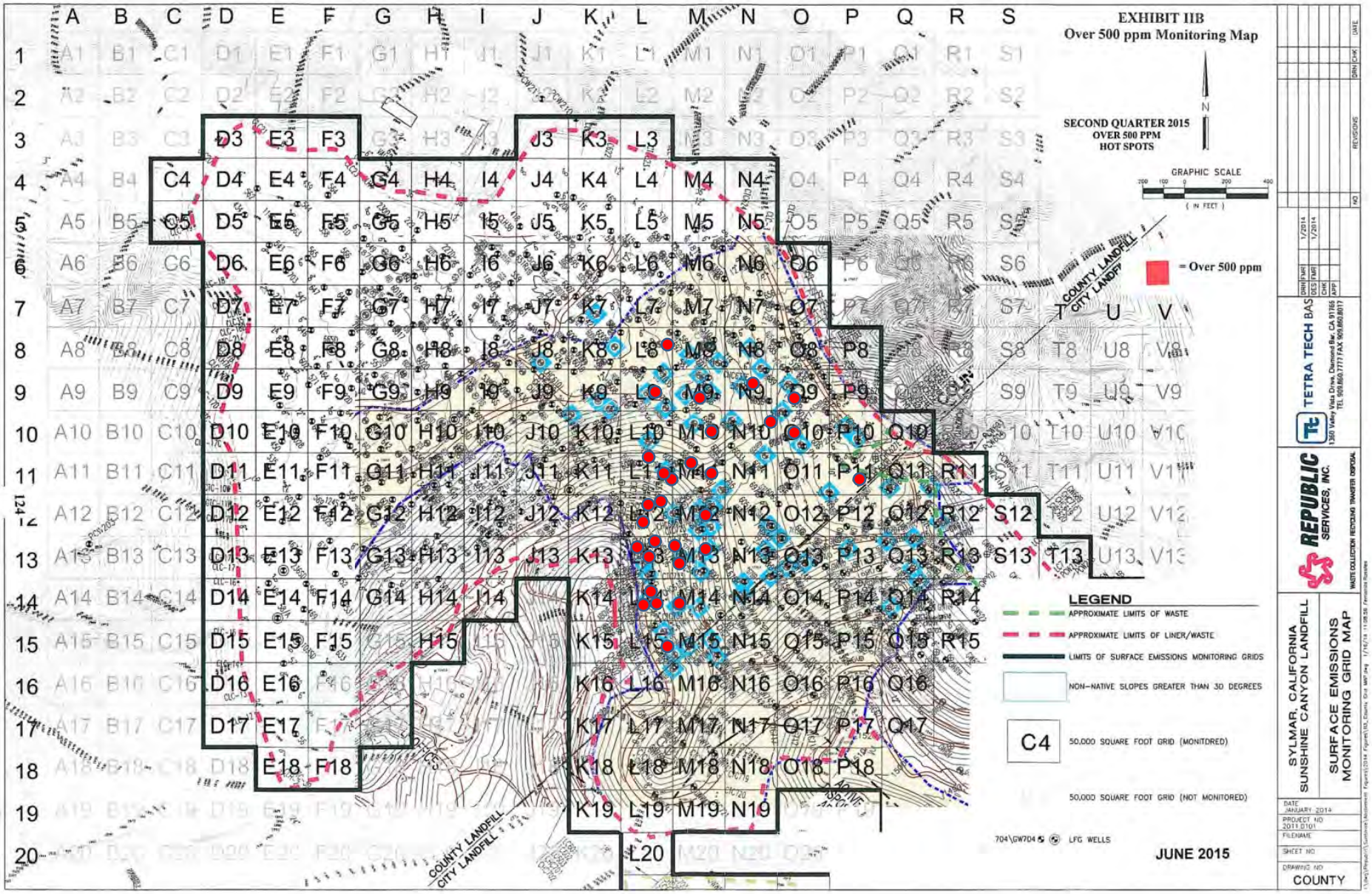
SCL LEA Composite Overlay Analysis: April 2015



SCL LEA Composite Overlay Analysis: May 2015



SCL LEA Composite Overlay Analysis: June 2015



Action Item #2 – Direct the SCL LEA to work with SCAQMD and Republic to take the steps needed to immediately improve the LFG collection performance by implementing the optimal combination of programs that will result in improved LFG system design and operations.

- Stipulated Agreement incorporated the following components:
  - SCL LEA Approved Geosynthetic Panel ADC Pilot Program
  - Improve overall LFG collection system
  - Pilot Operational Programs
  - **Improve intermediate cover performance**
  - SCL LEA Compilation of Potential Mitigation Programs/Practices
- SCL LEA worked with County Counsel, City Attorney, CalRecycle and Republic Services on finalizing language of agreement
- Stipulated Agreement signed by Republic in September and ADC program started on October 12, 2015.

Action Item #3 – Direct the SCL LEA to work with SCAQMD and Republic to modify landfilling operational practices that promote better landfill gas movement throughout the landfill and optimal leachate drainage that will improve the overall LFG collection by discontinuing the use of the 9" of daily soil cover, or allowing the peeling back of daily cover, or use of ADC to promote drainage, reduce saturation and increase permeability to promote movement of LFG, and at the same time develop methods to create a quantifiable reference performance baseline and other methods to determine measurable progress.

- TAC Approved ADC program on September 29, 2015
- ADC Pilot Program begin on October 12, 2015
- SCL LEA and SCAQMD collaboratively developed a set of "ADC Evaluation Protocols" which is currently being utilized.
- Republic submitted a proposal for the "peel-back", and now being reviewed by SCL LEA

Sunshine Canyon Landfill
Local Enforcement Agency

Update on Plastic EnviroCover Alternative Daily Cover (ADC) Pilot Program

SUNSHINE CANYON LANDFILL
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ADC Application @ 6:00 p.m. (10/12/15)

Odor Survey @ 5:00 a.m. (10/13/15)

ADC Assessment @ 6:00 a.m. (10/13/15)

ADC Assessment @ 11:00 a.m. (10/13/15)

Application of New Trash over ADC Working Face and ADC Interface

Application of New Trash over ADC

Application of New Trash over ADC

Application of New Trash over ADC Working Face and ADC Interface

"Why do we still have continuing odors, even with the ADC Program?"

- ADC is the first step to improving the LFG collection efficiency
  - Ends detrimental practice of 9" daily soil cover
- Focus now is on improving the intermediate cover performance
  - Covers a significantly larger surface area of SCL
  - Documentation of LFG emissions from these areas

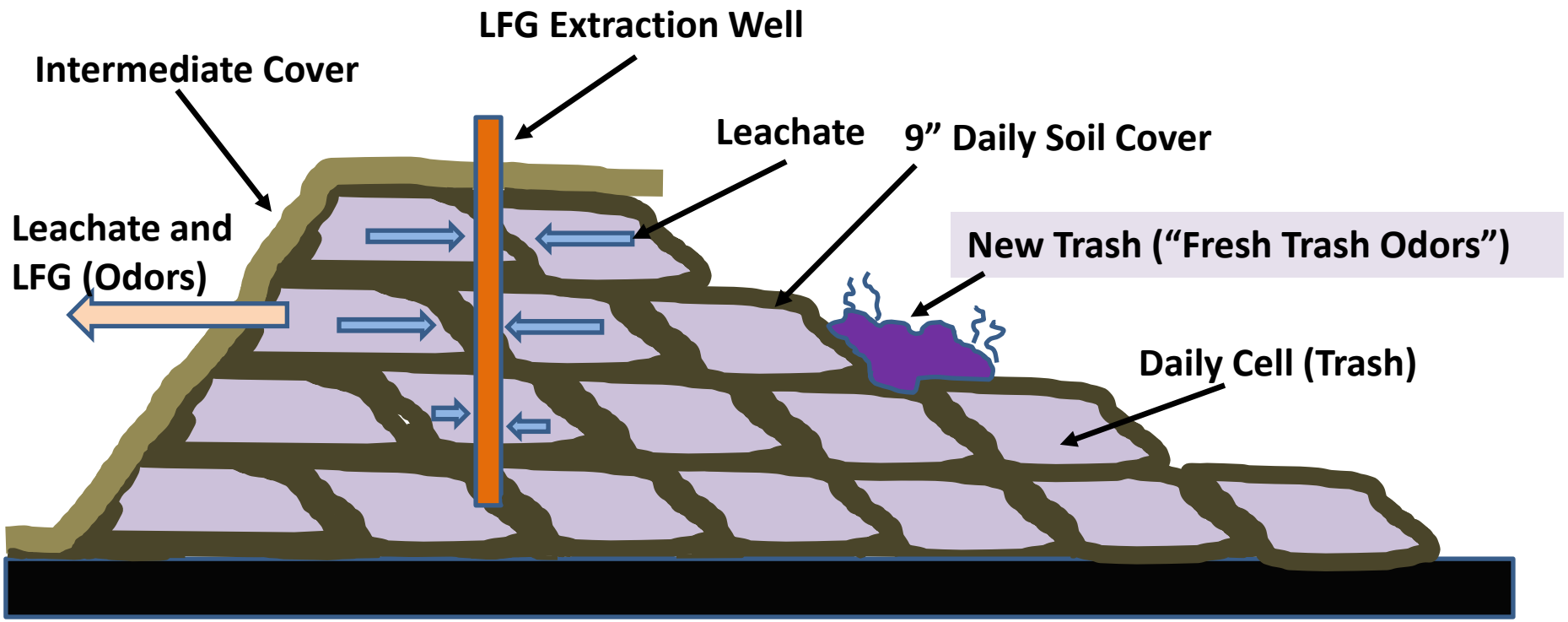
Differentiation of Odors

Four distinct types of odors:

- Fresh trash odors from previous day(s) trash under the ADC;
- Fresh trash odors from the current day's operation;
- Landfill gas odors existing from landfill mass impacted by application of 9" of compacted daily soil cover;
- Leachate odors

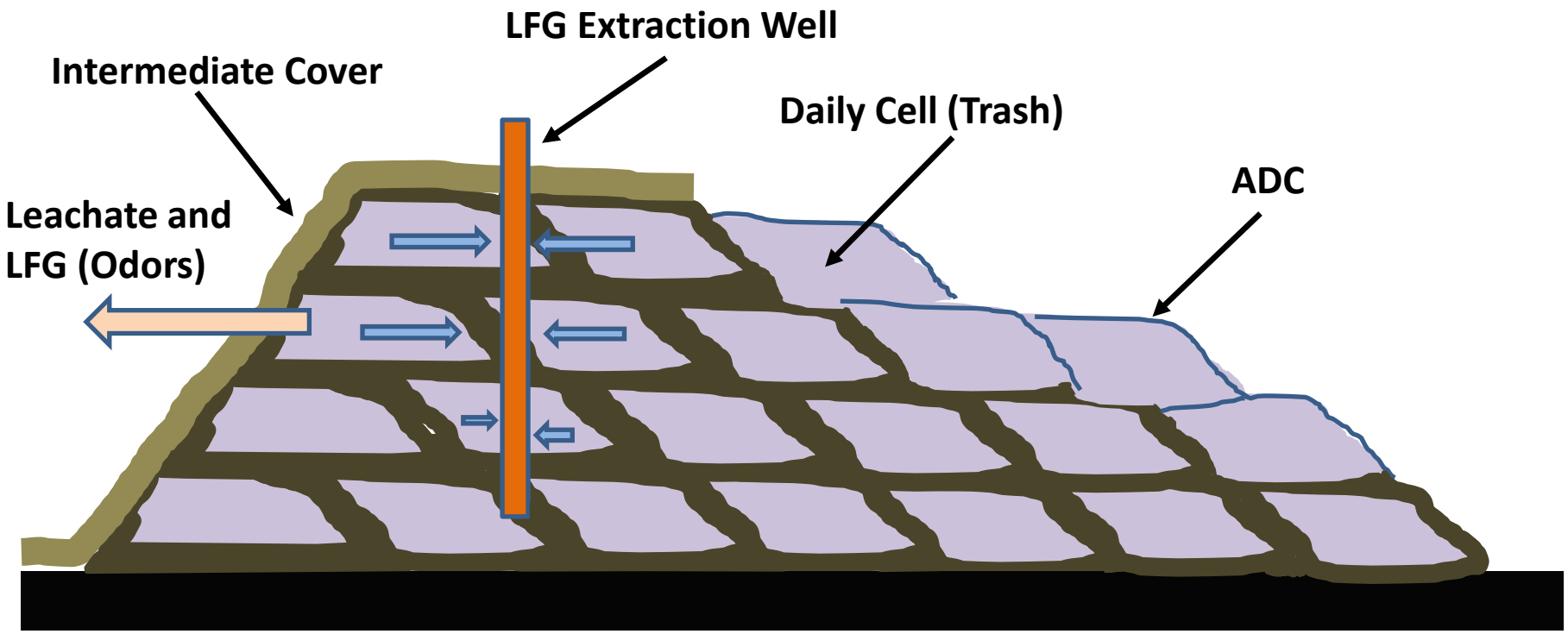
Why are there continuing odors?

With 9” Daily Soil Cover



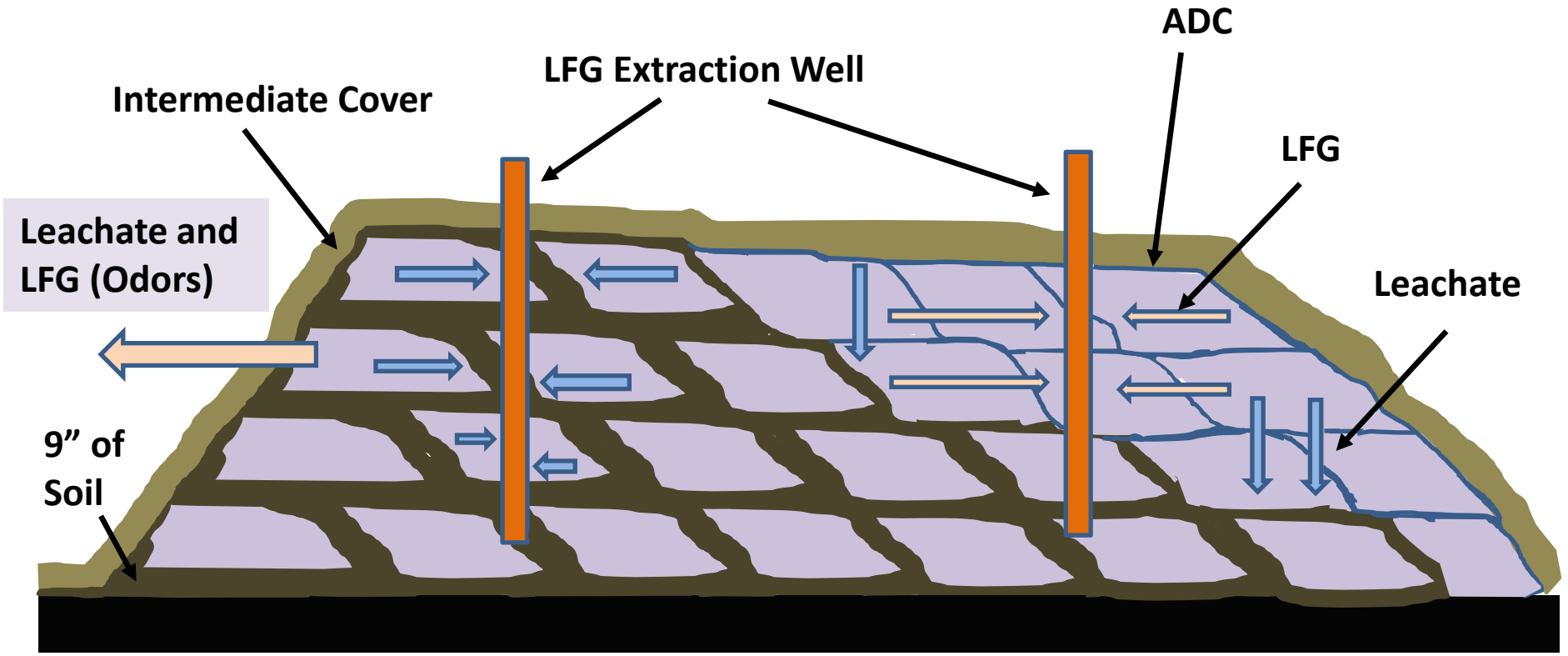
Why are there continuing odors?

With SCL LEA Recommended ADC



Why are there continuing odors?

With SCL LEA Recommended ADC



Evaluation Protocols

- Cooperative development effort between SCL LEA and SCAQMD
- Focus on type/source of odor(s)
- Evaluation criteria:
  - Scientific, technically and legally defensible
  - Based on actual data (metrics), observations, analysis
  - Combination of technical quantitative data and observations with qualitative observations

Fresh Trash Odor Evaluation Protocols

- Fresh Trash Odor: Number of complaints
- Field Assessment: Fresh Trash Smells
  - Effectiveness before/during start of ADC application (evening)
  - Effectiveness to control fresh trash odors after immediate placement of ADC
  - Effectiveness to control fresh trash odors the next day (and before application of new trash layer)
    - At the working face
    - In the neighborhood

Fresh Trash Odor Evaluation Protocols

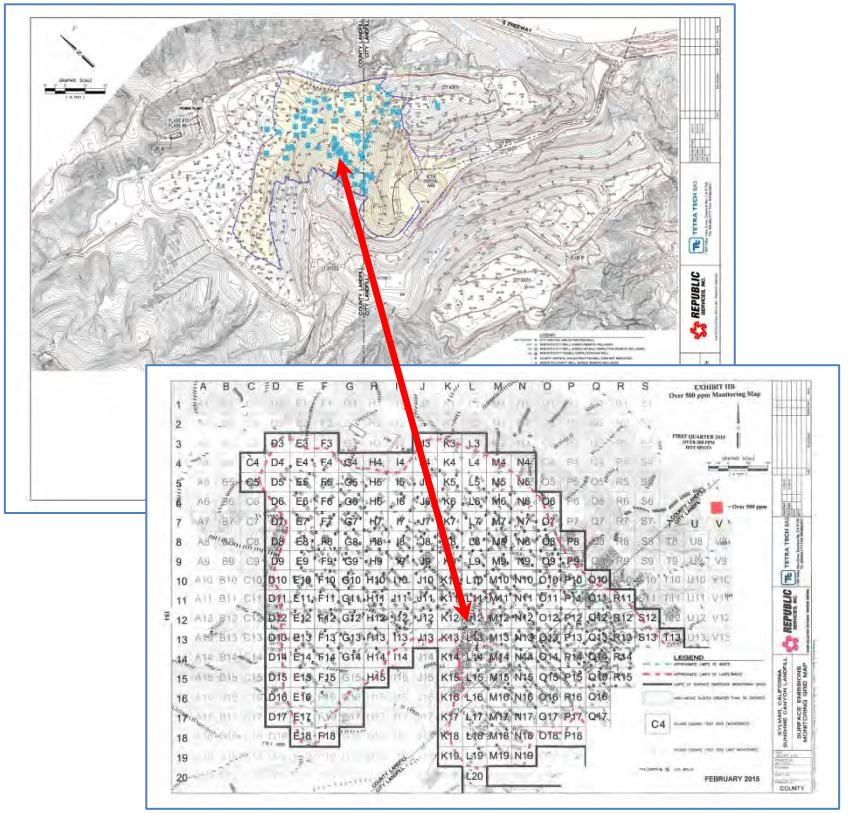
- Evaluation of ADC Implementation
  - Laydown coverage
  - Overlap coverage (seamless continuity)
  - Application of ballast soil
  - Number of tears/holes (durability)
  - Impact of wind (and other weather factors)

Landfill Gas Odors Evaluation Factors

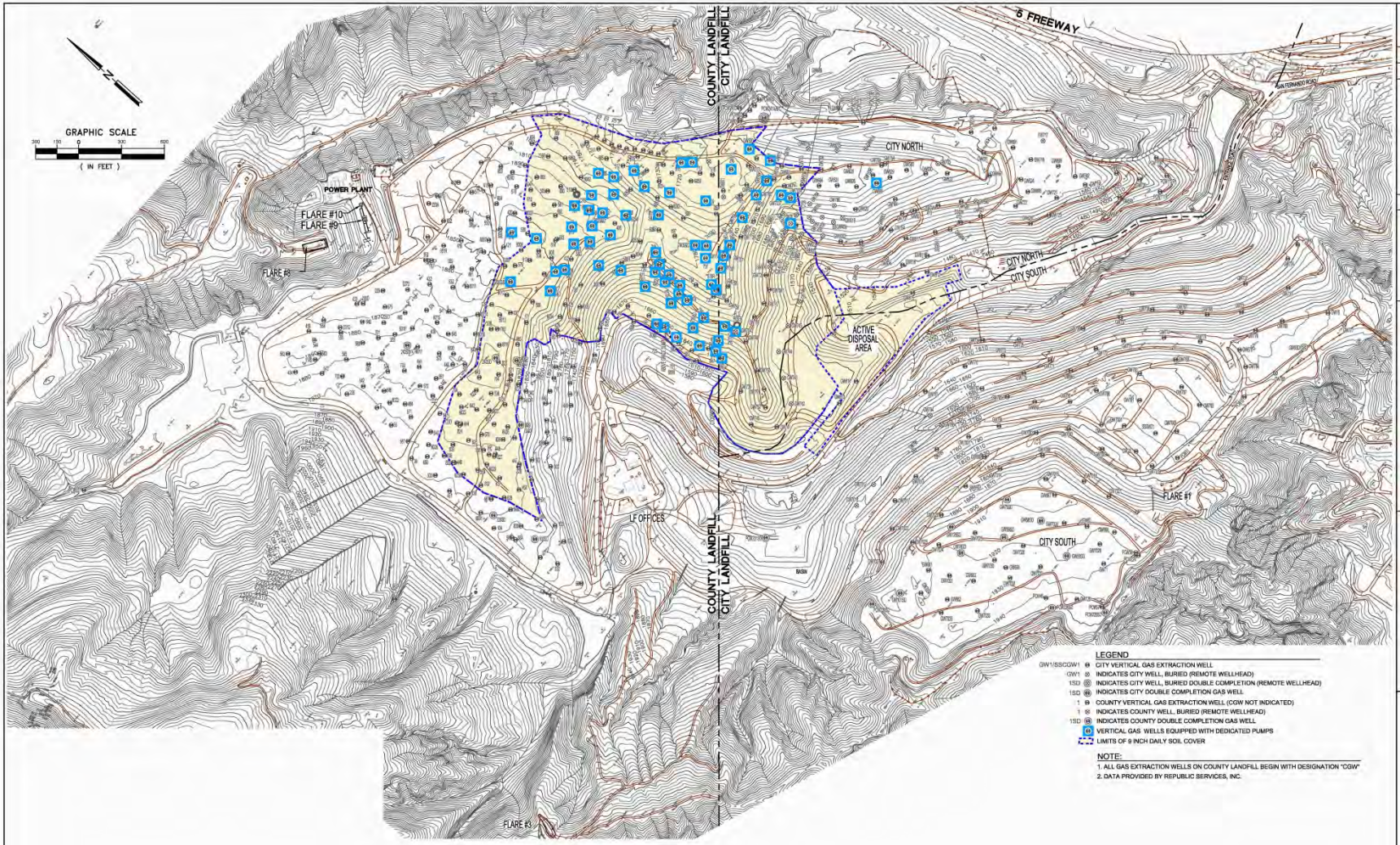
- Landfill Gas Odors: Number of complaints
- Surface emission monitoring data (SCAQMD and Republic)
- Visqueen field test on Intermediate Cover in "New Area"
- Performance of LFG Wells in "New Area"
  - Number of "Water Impacted Wells"
- Density/permeability of "New Area"
- Volume of Leachate extracted

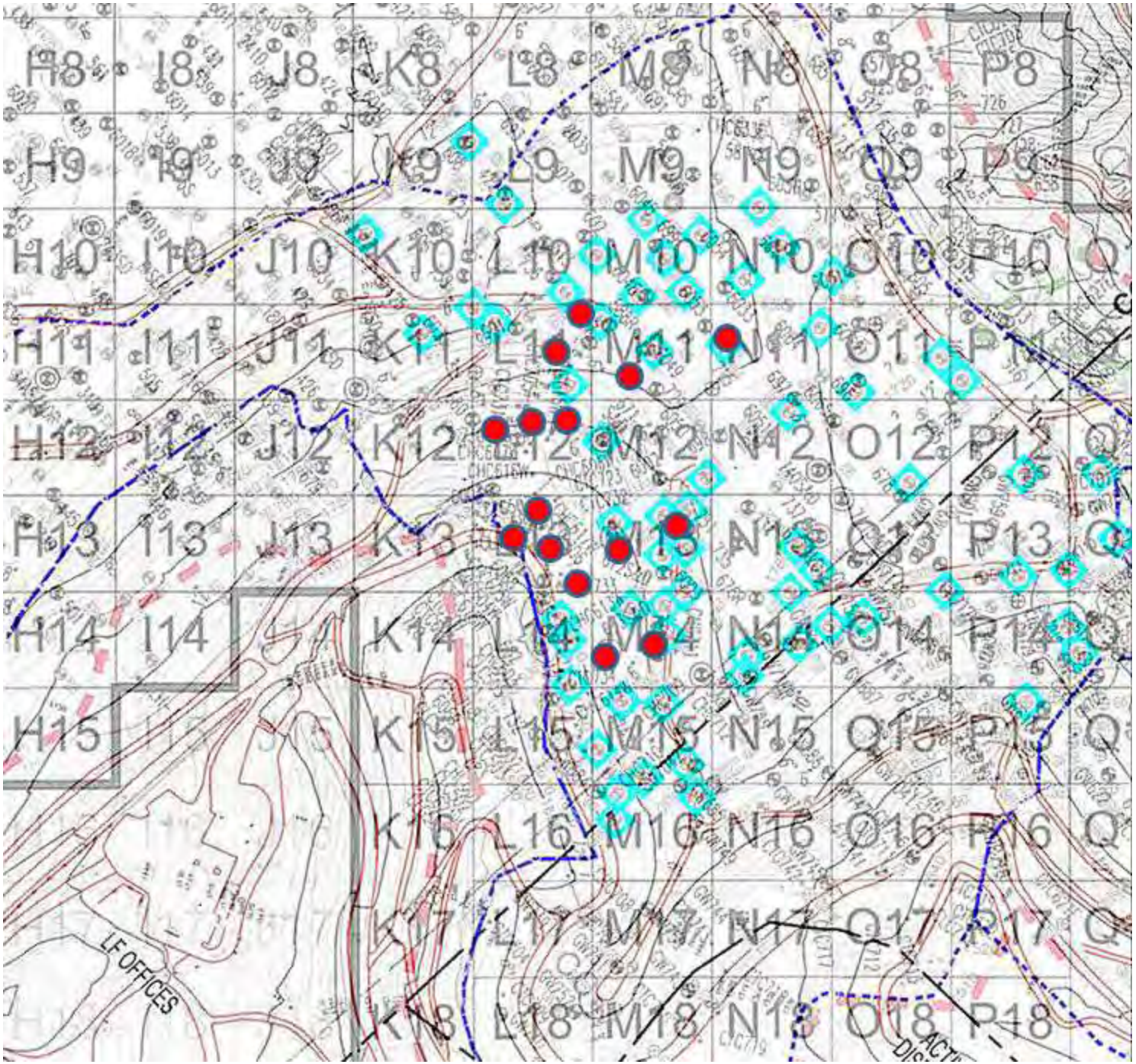
Action Item #4 – Direct the SCL LEA staff to implement the pilot visqueen field test, as soon as possible, to develop a reference baseline performance of the effectiveness of the daily and/or intermediate covers in a manner that provides physical and "visual" measurements of landfill gas emissions over a short period of time.

- **Visqueen Pilot Test (Completed)**
  - Protocols tested and revised
- **Visqueen Field Study**
  - Test Completed (Sept. 2015)



Impacted Gas Extraction Well Locations

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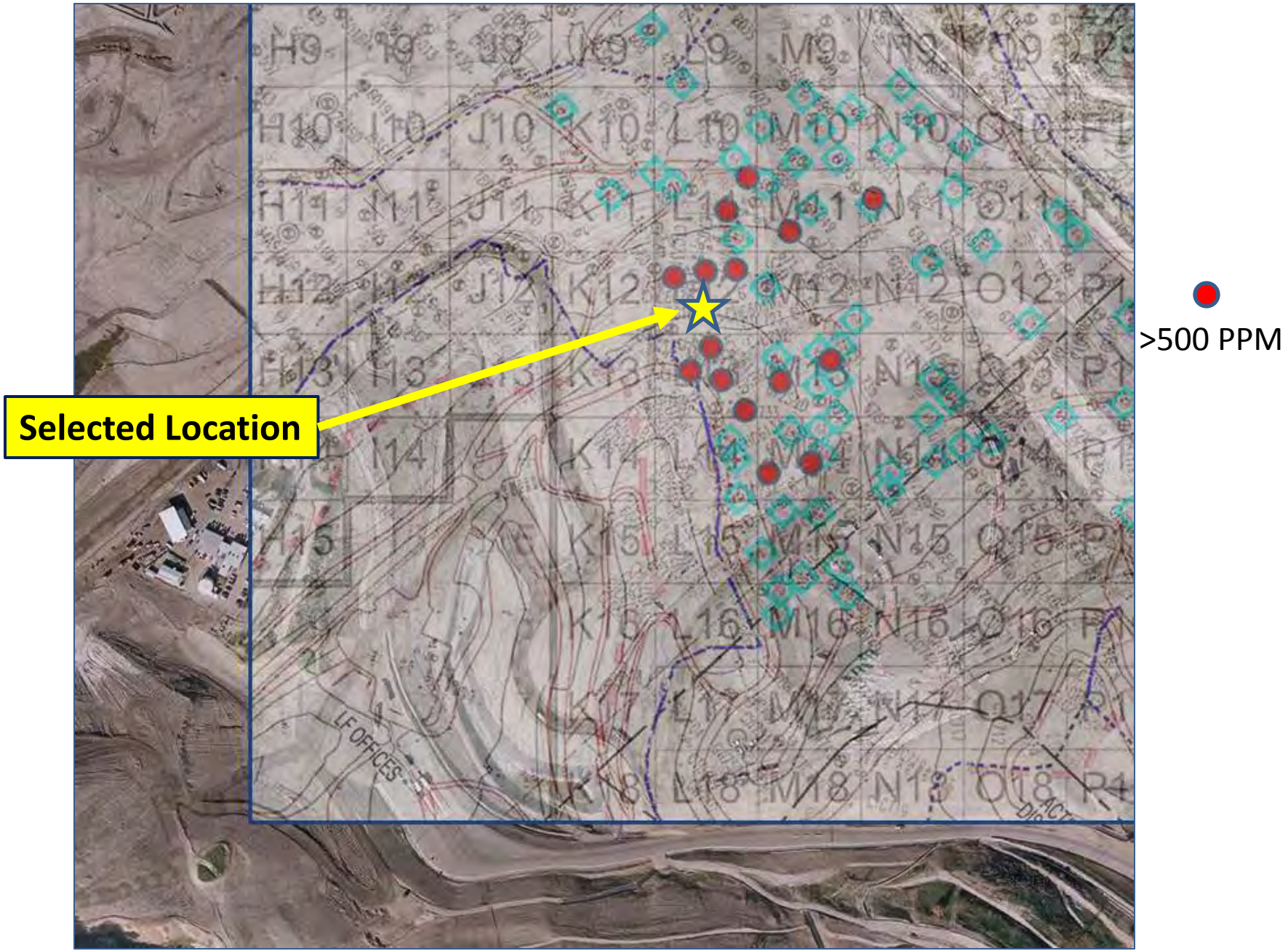
H9 I9 J9 K9 L9 M9 N9 O9 P9
H10 I10 J10 K10 L10 M10 N10 O10 P10
H11 I11 J11 K11 L11 M11 N11 O11 P11
H12 I12 J12 K12 L12 M12 N12 O12 P12
H13 I13 J13 K13 L13 M13 N13 O13 P13
H14 I14 K14 L14 M14 N14 O14 P14
H15 K15 L15 M15 N15 O15 P15
K16 L16 M16 N16 O16 P16
K17 L17 M17 N17 O17 P17
K18 L18 M18 N18 O18 P18
LF OFFICES

Selected Location of Visqueen Test



Overview of Visqueen Test

- Visqueen is part of the overall ADC Performance evaluation methods
- SCL LEA developed / implemented and within SCL LEA control (QA/QC)
- “Physical” and “visual” documentation
- Easily monitored (e.g., time-lapse camera)
- Provides continuous “monitoring”
- Utilized in conjunction with other factors
- Can have in multiple locations

Pilot Visqueen Study Installation (May 2015)

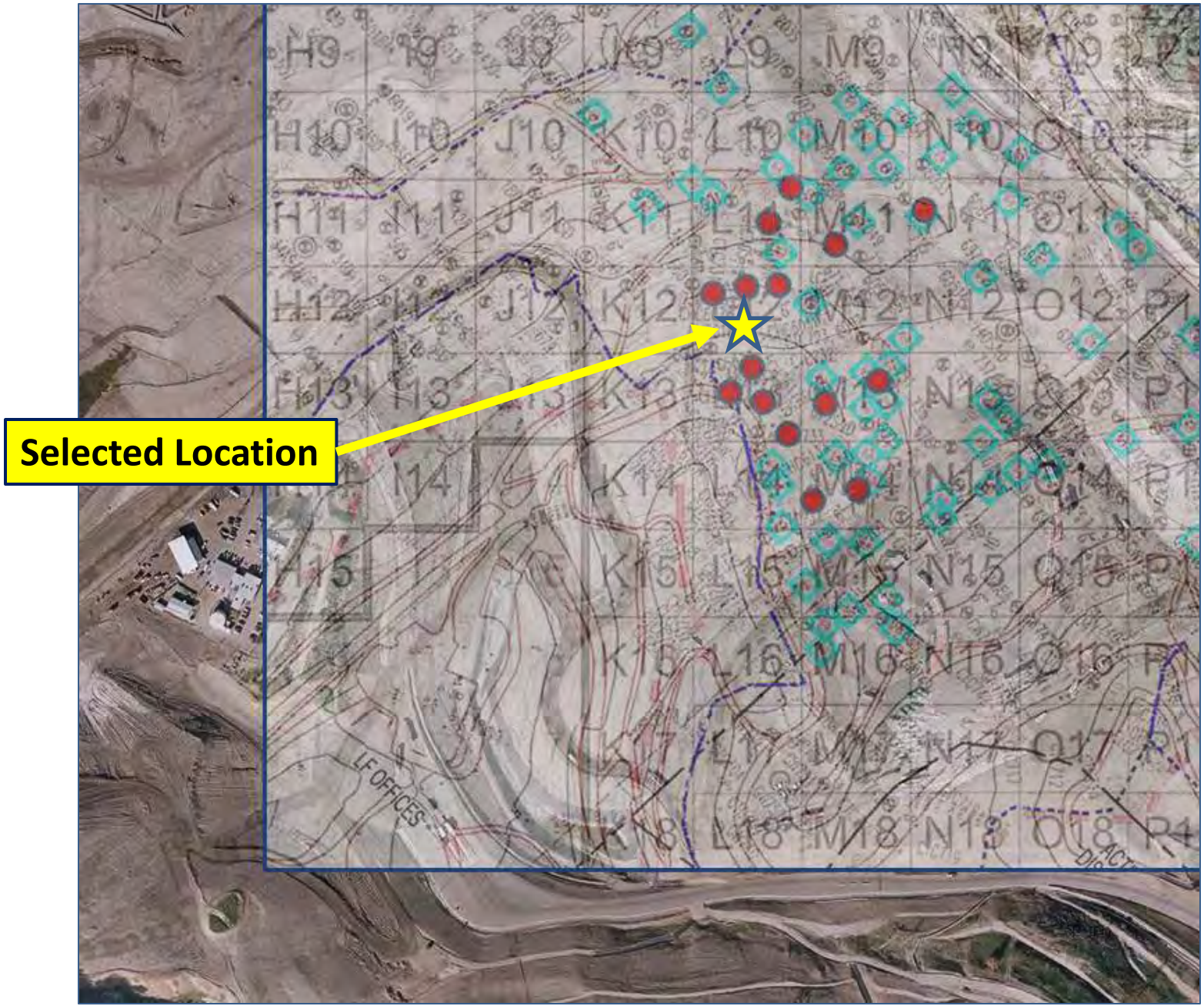
Pilot Visqueen Study Installation (May 2015)

Pilot Visqueen Study Installation (May 2015)

Pilot Visqueen Study Installation (May 2015)

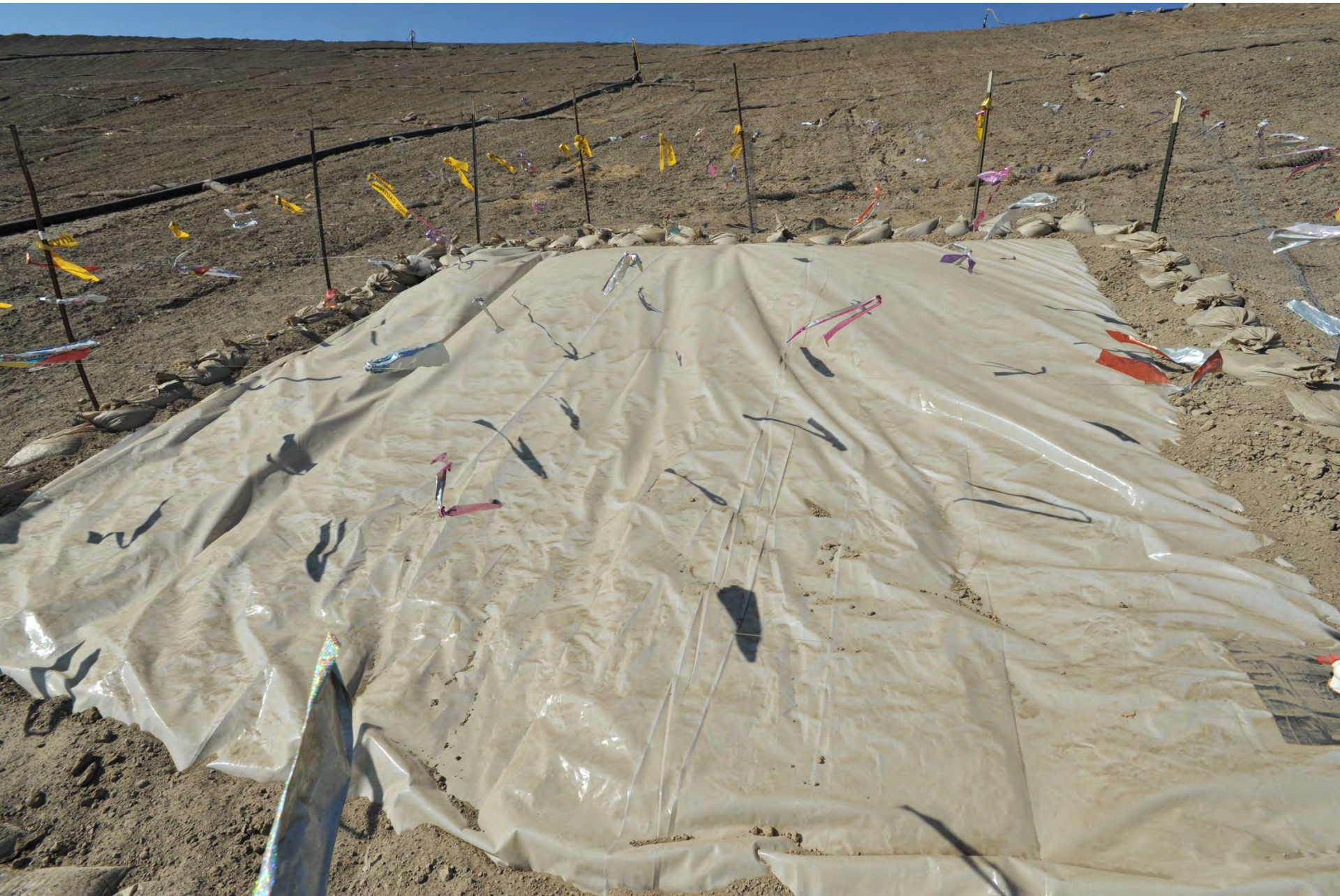
Pilot Visqueen Study Installation (May 2015)

Selected Location of Visqueen Installation Study



Visqueen Installation (July 2015)

Visqueen with Trapped Landfill Gas (August 26, 2015)



Time Lapse Photography of Visqueen

Freeze Frame at 2:52:00 PM

Freeze Frame at 2:52:30 PM

Visqueen Installation (August 2015)

Action Item #5 – Direct the SCL LEA staff to work with Republic to improve the performance of the intermediate cover, e.g., increase thickness of intermediate cover, utilization of lower permeability intermediate cover materials, utilization of higher compaction to increase density of the intermediate cover, utilizing cured/mature compost to improve vegetative growth (and potential biofilter affect), utilization of less steep intermediate slopes, and/or utilization of biodegradable plastic ADC in combination with the statutory soil intermediate cover.

- SCL LEA developed a list of alternatives to improve the performance of the intermediate cover (part of the SCL LEA "Compilation")
- SCL LEA started discussion with Republic on various options to improve intermediate cover performance
- SCL LEA and SCAQMD will work together to develop pilot programs to test various methods of improving the intermediate cover. Each program will have quantitative evaluation protocols/procedures

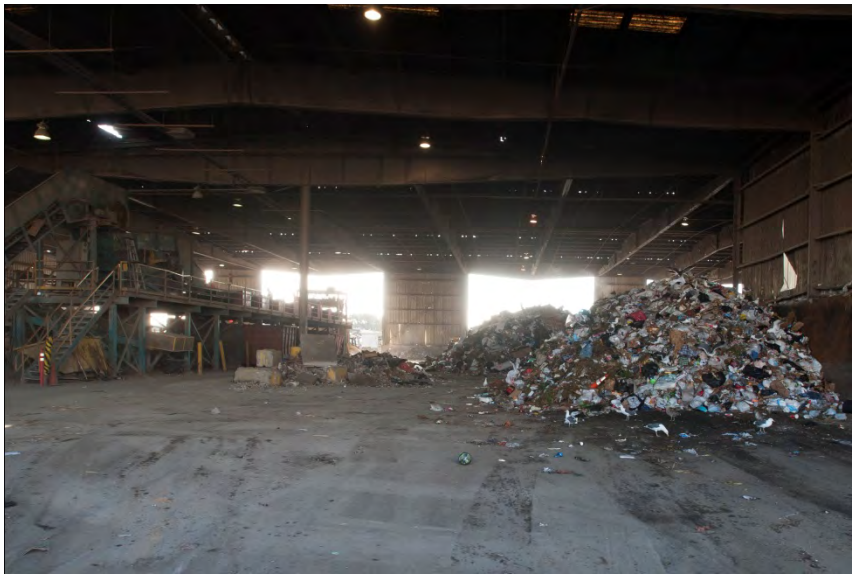
Action Item #6 – Direct the SCL LEA staff to work with the respective local enforcement agencies to evaluate Republic's Transfer Station Odor Reduction/Mitigation Program at their own transfer stations as to its effectiveness. SCL LEA shall independently determine the best management practices for transfer stations, and develop any additional recommendations for improving their performance.

- SCL LEA has compiled Best Management Practices
- Outreach to other LEAs and Industry
- Transfer station surveys begin in November 2015
- Assessment form and protocols being finalized

SCL LEA Assessment of Transfer Station Odor Mitigation Protocols

- SCL LEA revising facility evaluation protocols
- SCL LEA continuing compilation of best management practices
- SCL LEA to work with other LEAs to coordinate site visits

SCL LEA assessment of odor mitigation practices at Republic-Owned transfer station (Falcon Transfer Station, November 2015)



Action Item #7 - Direct the SCL LEA staff to work with the respective local enforcement agencies to conduct site assessments of transfer stations (which are not Republic-owned/operated) to determine the potential to implement similar odor reduction/mitigation practices as part of the conditions to bring waste to the landfill.

- Compiled list of non-Republic transfer stations
- Will be implemented after the Republic transfer stations
- Will start site assessment of non-Republic transfer stations with City of Los Angeles' CLARTS facility

Action Item #8 - Direct the SCL LEA to report back within 45 days on the results and analysis of the SCL CAC waste characterization study that was done on the wastestream from the City of Los Angeles transfer station.

- Waste Characterization Study (CLARTS)
  - Report completed and presented to CAC
  - Final Report presented at previous Board meeting
  - Report Submitted to CalRecycle
  - Report published on MSW Management Magazine
  - Report posted on SCL LEA Website
    - Provided to CalRecycle

Action Item #9 - Direct the SCL LEA staff to immediately plan and conduct additional comprehensive waste characterization studies of the overall SCL waste stream which can be utilized as a baseline (and to determine future changes) of the material types, physical and chemical characteristics, and any other data that can be utilize do develop additional odor mitigation measures.

- Waste Characterization Study (SCL Wasteshed)
  - Coordination with SCAQMD & CalRecycle
  - Physical Sort Complete (August 2015)
  - Lab / Chemical Analysis (Completion by December 2015)
  - Final Report (Expected Delivery: February 2016)
- SCL LEA trained CalRecycle as part of project, and SCL LEA invited to Sacramento to provide briefing

SCL LEA Waste Composition Study

Ultimate/Proximate, BTU, & BMP Samples

Demobilization: Equipment Cleaning / Return

CalRecycle Staff Visit (August 26, 2015)

- Compare / Contrast with CalRecycle's Uniform Waste Characterization Method
- Learn New Characterization Protocols / Procedures
- Evaluate QA/QC Procedures
- Evaluate Health & Safety Procedures
- Learn Utilization of New Types of Waste Data

Action Item #10 - Direct the SCL LEA staff to report back within 45 days on the status of each of the above directives, and any support/assistance that the SCL LEA will require from the Board of Directors.

- Status Report on Adopted Board Motion completed and distributed to Board members (and posted on website)
- Copy sent to following groups:
  - South Coast Air Quality Management District
  - City Planning Department
  - County Regional Planning
  - Los Angeles Regional Water Quality Control Board
  - County Department of Public Works
  - Sunshine Canyon Landfill Community Advisory Committee
  - City Attorney Office
  - County Counsel
  - Republic Services

Action Item #11 – Direct SCL LEA to work with Republic to determine and maintain an ongoing inventory, updated monthly, of all landfill gas collection wells which have more than 10% of their overall length below grade filled with leachate or water.

- Republic required to submit monthly report on all landfill gas collection wells impacted by liquids
- Provide SCL LEA with a map of the impacted collection wells
- Republic will submit to the SCL LEA drawings of watered-in well locations for purpose of analyzing “overlays”.

Sunshine Canyon Landfill
Local Enforcement Agency

Summary of
SCL LEA Odor Mitigation Programs

SUNSHINE CANYON LANDFILL

SCL - LEA

LOCAL ENFORCEMENT AGENCY

SCL LEA Approach to Odor Mitigation

- Holistic, multi-pronged and multi-disciplinary systems approach, to create infrastructure changes
- **Short Term**
  - Landfill operations within SCL LEA control
  - Facilities within Republic's control
  - Other facilities within other "LEAs' control
- **Medium / Long Term**
  - Developing/supporting infrastructure changes to solid waste management system
    - Locally / Regionally / Statewide

Short Term Approach to Odor Mitigation

- Within direct SCL LEA control at landfill
  - Alternative Daily Cover
  - **Improve intermediate cover**
  - Improve LFG collection system efficiency
  - Load rejection at scale-house
- Republic-owned Transfer Stations
  - Odor mitigation at Republic-owned transfer stations
  - Load “treatment” or load rejection
  - Requiring generator (source) treatment
- All “Other” transfer stations in LA County

Medium/Long Term Approach to Odor Mitigation

- Local Infrastructure Collaboration
  - Organics diversion mandates (City Franchise 2017)
  - SCL LEA collaboration with Bureau of Sanitation on generator and facility oversight and enforcement
    - CLARTS Waste Characterization Study (2015)

AB 1826 Organics: Food, greenwaste, clean wood, food contaminated paper, etc.

Medium/Long Term Approach to Odor Mitigation

- Regional / State Infrastructure Collaboration
  - SCL LEA collaboration with CalRecycle on infrastructure requirements for Statewide landfill organics ban (2025)
    - SCL LEA / CalRecycle Waste Composition Study (ongoing)

AB 1826 Organics: Food, greenwaste, clean wood, food contaminated paper, etc.

Additional SCL LEA Community Efforts

- SCL LEA providing detailed briefings CAC members

- SCL LEA also providing detailed technical briefings on overall odor mitigation programs / issues via in community small group settings.

SCL LEA's Landfill Mitigation Efforts in International Spotlight

Shedding Daylight on Landfill Odors

John Trotti • October 7, 2015

Located in Northwest Los Angeles County near the city of Sylmar, CA, and operated by Republic Services, Sunshine Canyon Landfill has found itself in the crosshairs of public attention over a variety of odor complaints. In response to public concerns, the Sunshine Canyon Landfill–Local Enforcement Agency (SCL-LEA) was formed to properly manage the situation, whose compilation of potential mitigations practices and programs is the most comprehensive report on the subject of landfill odors, going beyond those associated with "fresh trash" to those of a more general nature.

Click here to download: "Sunshine Canyon Landfill LEA Odor Mitigation"

SCL-LEA is an entity created to be the primary local agency providing the regulatory permitting, enforcement, and operational compliance oversight for the California Environmental Protection Agency's Cal Recycle (formerly California Integrated Waste Management Board).

- Two articles already published in October 2015
  - Continued coverage of the SCL LEA efforts
- SCL LEA efforts to be "transparent" and decisions to be have defensible technical and legal basis.

SCL LEA Dropbox Account

- Public Access “Dropbox” Folder (via **www.scllea.org**) :

SCL LEA ODOR MITIGATION FOLDER

www.dropbox.com/sh/nm5341eupq7dxj5/AAA42v6IZFt-CGYQdFffIfqta?oref=e&n=88965574

- Adopted Board Motion
- 45-Day Status Report (and Attachments)
- Reference Materials and Documents
- Binders: Technical Backup Materials
- SCL LEA Compilation (Recommendations)

SUNSHINE CANYON LANDFILL

SCL - LEA

LOCAL ENFORCEMENT AGENCY

Sunshine Canyon Landfill Local Enforcement Agency

Questions?

David Thompson 213-252-3932

david.thompson@lacity.org

SUNSHINE CANYON LANDFILL

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SUNSHINE CANYON LANDFILL

SCL - LEA

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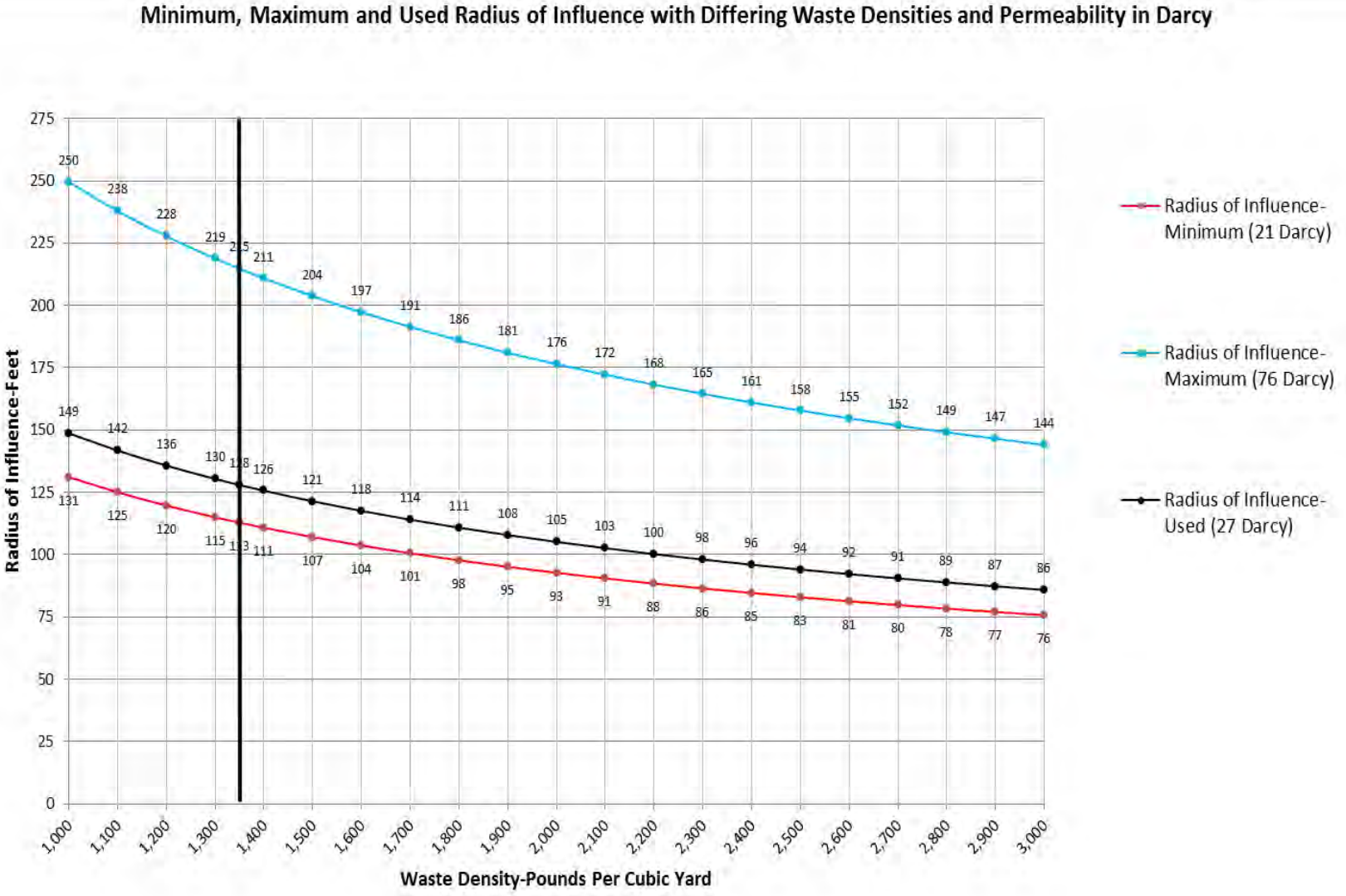
ADDITIONAL TECHNICAL DOCUMENTATION

Radius of Influence vs Density



SCAQMD Interagency Task Force, Source SCL LEA 2012

Water Vapour Transmission Test Results

Precision Geosynthetic Laboratories

ASTM Test Method E96, PGL Job No. 010965

Enviro™ Cover Water Vapor Transmission

1.5 mil Daily Enviro™ Cover: 0.023 $g/m^2/day$

2.0 mil Progressive Daily Cover: 0.011 $g/m^2/day$

Comparison with Soil Cover

Using the water vapor transmission data of the 1.5 mil daily Enviro™ Cover and making assumptions about typical temperature, humidity and pressure, the permeability of water vapour through the 1.5 mil daily Enviro™ Cover is calculated in Appendix 1 to be roughly 6 x 10-17 m/s. This is 1/167,000,000th of the typical permeability of well-compacted clay of 1 x 10-8 m/s.

Therefore, Enviro™ Cover deployed over the active working face is far more effective than soil in controlling odours through the cover material.

EPI Environmental Products Inc. Paper – EC Controls Odours in Landfills Doc #: EC209 / Rev.0 / Effective Date: August 14, 2014

EQUIVALENT DARCY'S LAW FLOW RATE FOR POLYETHYLENE CALCULATED FROM GAS TRANSMISSION DATA

Methane Gas Loss Through Polyethylene Film

(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

Methane Gas Loss Through Daily Cover Soil

Soil Conditions	Flow Through (1,000 m^2 Area) Soil
kw=10-8 m/sec, compacted clay over firm subgrade	117 m^3/day
kw=10-6 m/sec, typical clayey soil compacted over poor subgrade (such as landfill waste)	11,700 m^3/day
kw=10-5 m/sec, typical sandy/clayey soil over poor subgrade	117,000 m^3/day

Methane Gas Loss Through Polyethylene Film (1,000 m^2 Area)

(From Matrecon Laboratories, Oakland, Calif., 1991)

2mil, permeation = 92 cm^3/100 in^2/day =	1.4 m^3/day
3mil, permeation = 73 cm^3/100 in^2/day =	1.1 m^3/day
5mil, permeation = 49 cm^3/100 in^2/day =	0.76 m^3/day