

# GETTING ODOURS UNDER CONTROL

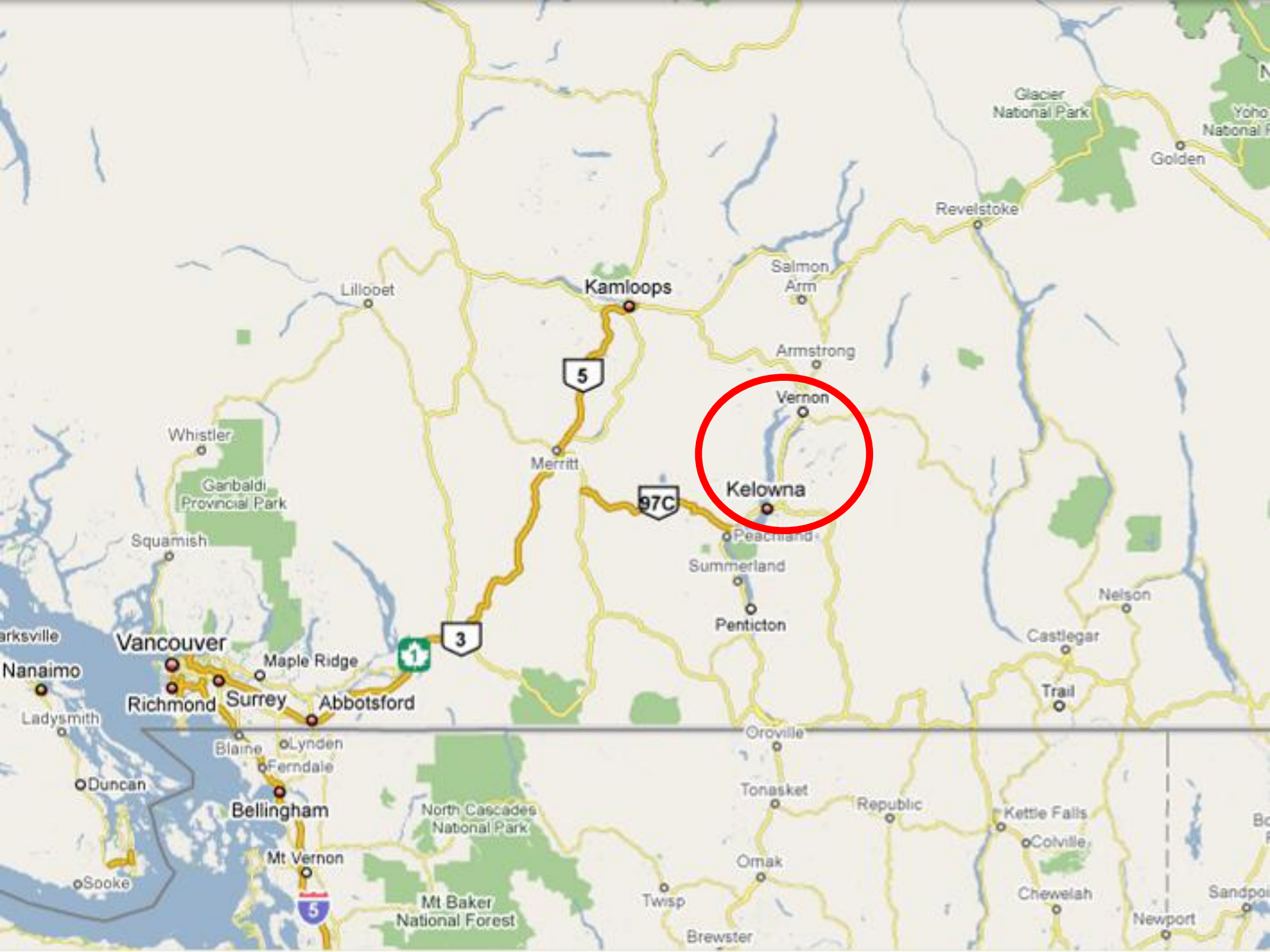
## KELOWNA/VERNON BC BIOSOLIDS COMPOSTING FACILITY

Tim O'Neill, Engineered Compost Systems

Gordon Light, City of Kelowna

Marcia Browne, City of Kelowna





# Project Time-Line

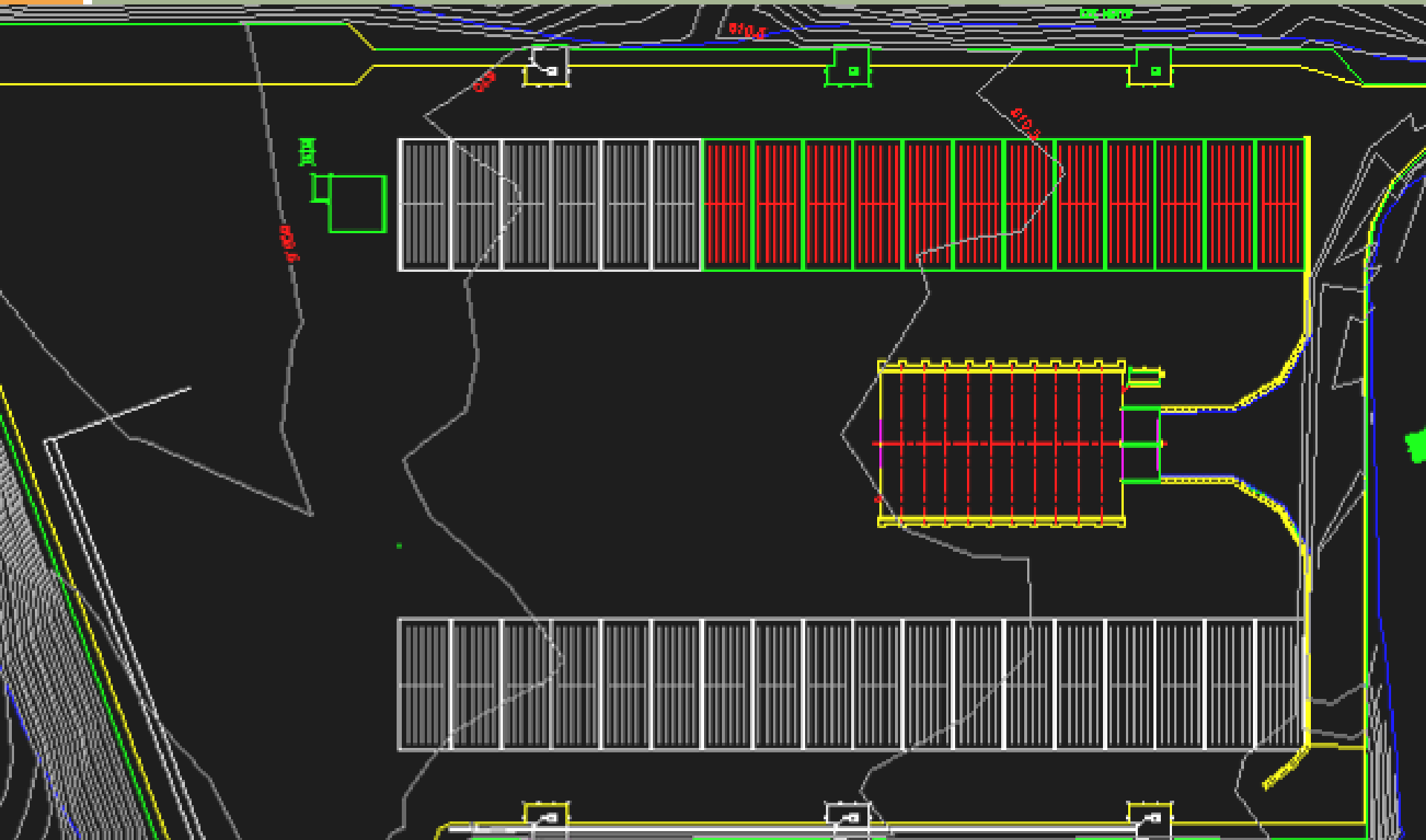
## □ **Phase I**

- 2004/5 – Design
- 2006 – Operations Begin
- 2008 – Odour Issues Take Over

## □ **Phase II**

- 2008 Odour Study & Expansion Design
- 2009 Odour Trial & Begin Construction
- 2010 Full Scale Start Up

# Phase I Build-Out











# Phase I Mixing









# Operations: Plan vs. Reality

|             |       | <b>2005 Proposed Design</b> | <b>2006-2008 Operations</b> |
|-------------|-------|-----------------------------|-----------------------------|
| Tip Tonnage | tpm   | 3,150                       | 2,350                       |
| Initial Mix | C/N   | 25-30                       | 13 – 19                     |
| Primary     | Area  | 51,000                      | 34,000                      |
|             | Days  | 24                          | 14                          |
|             | Depth | 7.5                         | 10.5                        |
| Secondary   | Days  | 24                          | 19                          |
|             | Depth | 9                           | 14                          |

*Smell*

*Something?*

[www.no-ogo-grow.com](http://www.no-ogo-grow.com)

# Improvement Efforts

- Added leachate tank (06)
- Added biofilters to primary ASP's (07)
- Added cover layer to secondary piles (07)
- Began top watering piles in summer (07)
- Ordered 1<sup>st</sup> Bulk Mixer (08)
- Ordered 2<sup>nd</sup> Bulk Mixer (09)







# Phase II Expansion Design 2008

- MMM Group (Project Lead)
  - ECS: Process Modeling & Design
  - Dayton & Knight: Odour Control
- **Re-Focused on Odour Problem**
  - **Characterize & Model**
  - **Identify Sources & Solutions**
  - **Prove It!**

# Dayton & Knight Tasks

## □ **Odour Characterization**

- Source location
- Strength (OU/m<sup>3</sup>)
- Thresholds, hedonic tone, offensiveness
- Constituent analysis

## □ **Odour Modeling**

- Topographical & Climate
- Dispersion

# D&K October 08 Odor Data

## PRIORITY ODOUR SOURCES IN TERMS OF FLUX

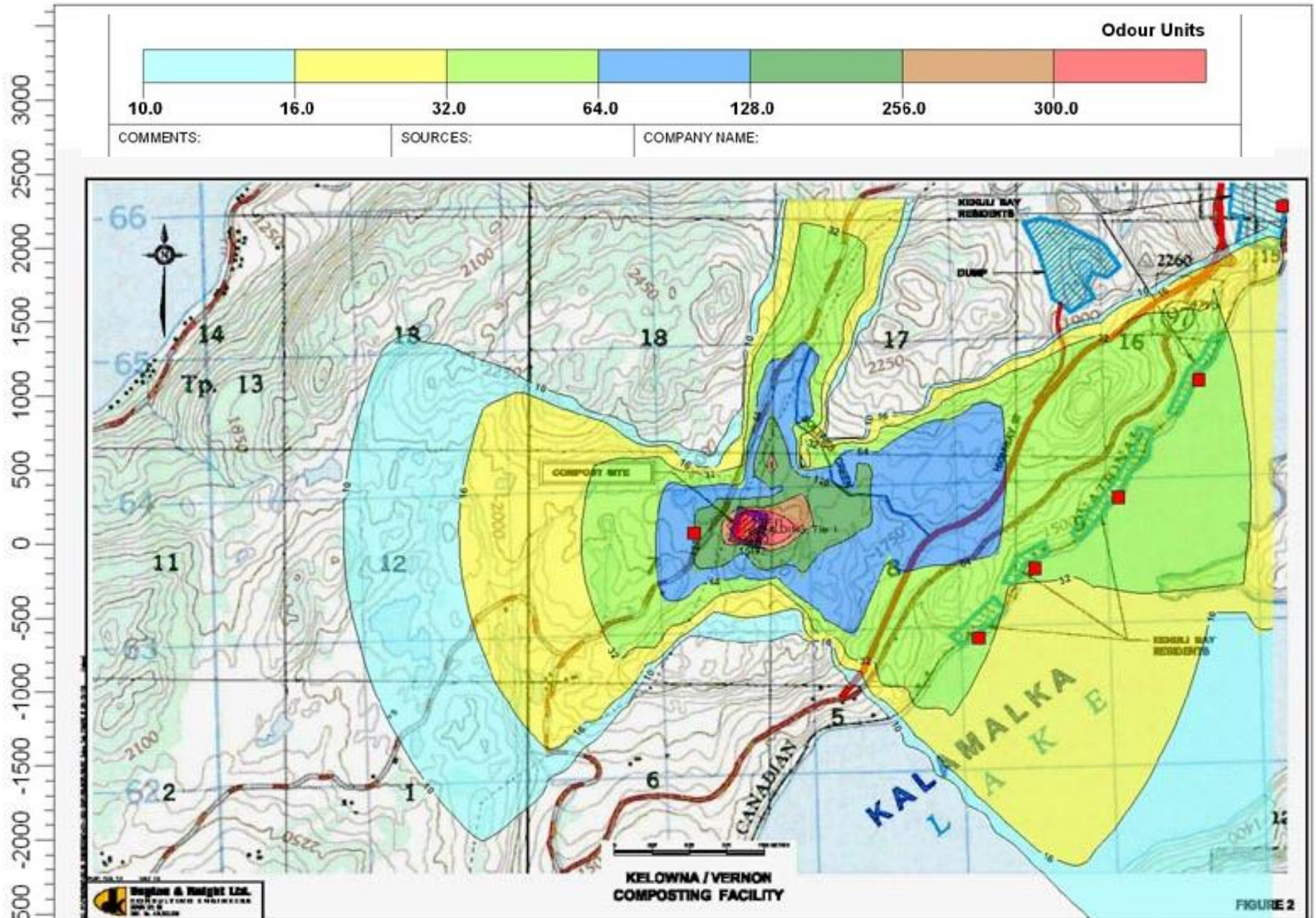
| Priority | OU/s<br>*1000 | Location  |
|----------|---------------|---|
| 1        | 34            | Mixing building                                   |
| 2        | 19            | Top of mid age covered primary zone, negative air |
| 3        | 18            | Overs (slightly disturbed)                        |
| 4        | 14            | Fresh tipped biosolids                            |
| 5        | 10            | Top of a curing pile                              |
| 6        | 9             | Top of covered secondary zone                     |
| 6        | 9             | Exposed face of primary zone                      |



# Drainage Pattern

© 2008 Tele Atlas  
Image © 2008 Province of British Columbia  
Image © 2008 DigitalGlobe  
Image © 2008 TerraMetrics  
Streaming 100%

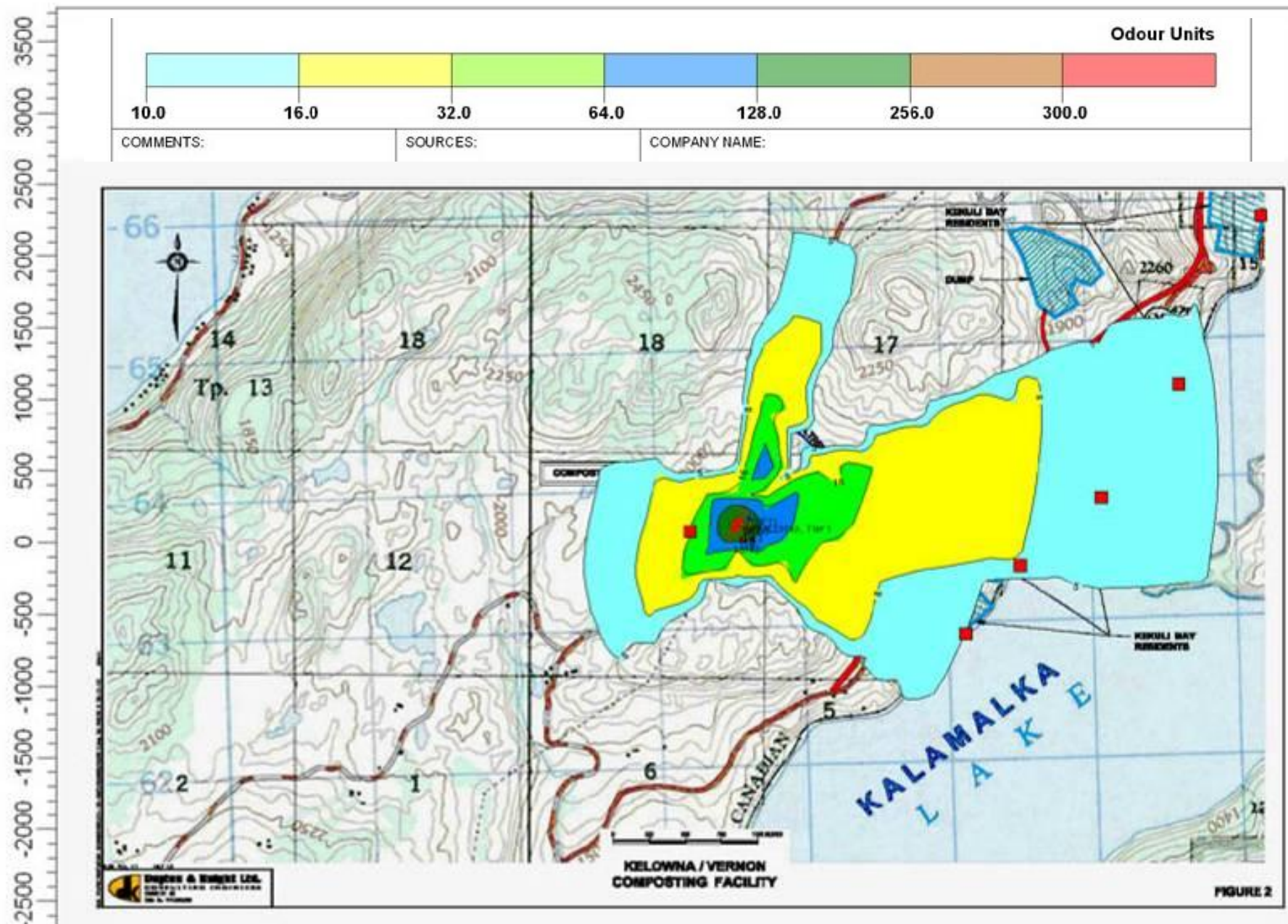
PROJECT TITLE:  
**Kelowna-Vernon Composting Facility**  
**Existing Evening Emissions**



PROJECT TITLE:

# Kelowna-Vernon Composting Facility

90 % reduction in emissions from all piles, 95% from building

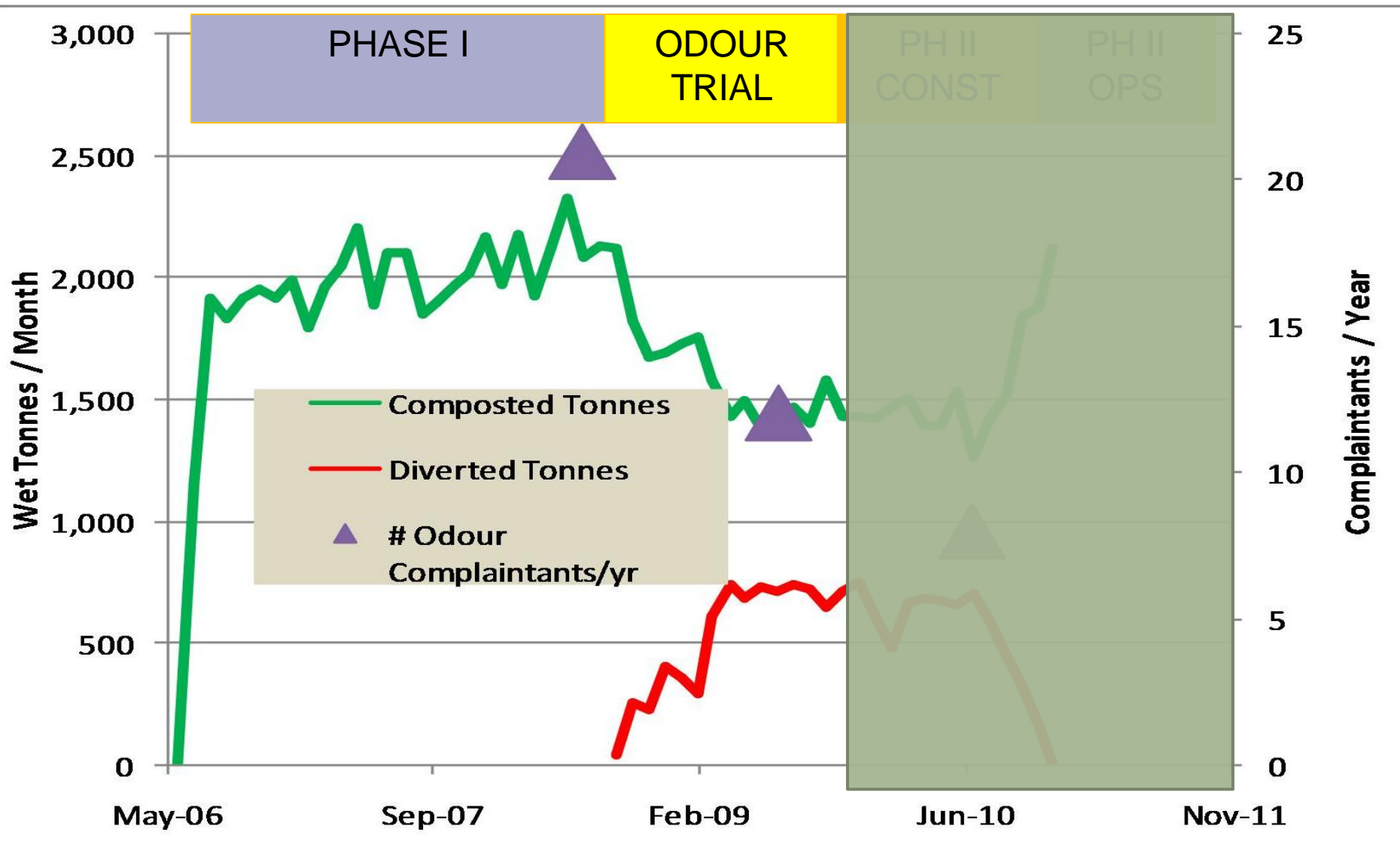


# Solutions: BMP's & Monitoring

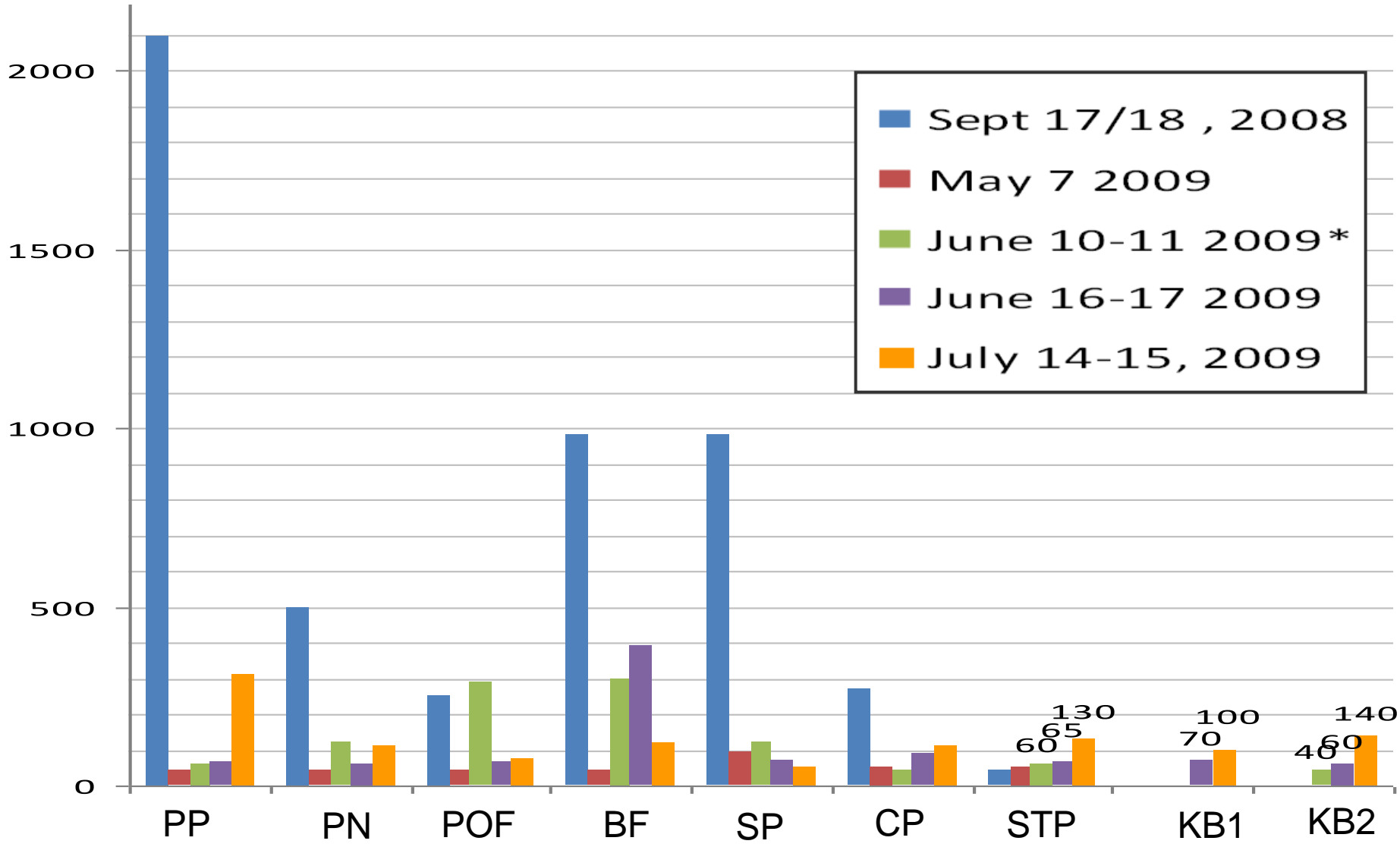
- **Make Less Odour + Improve Capture/Control**
  - Start with a BMP mix
  - Reduce pile height
  - Increase retention time
  - Improve biofilter media
- **Enhanced Odour Management**
  - Real-Time monitoring & logging
  - Develop protocols



# Time-Line



# Odour Trial Results: OU/M3



# Green Light for Phase II

- Construction June 2009 – September 2010
- Three more fan groups with Ozone + Biofiltration
- Capacity: Primary & Secondary - 4,000 tpm
- Total Cost \$5.5 M + \$1.0M

# Phase II Construction



# Phase II Construction



# Phase II Construction



# Phase II Complete



# Phase II Complete





# Odour Action Plan

## **Measured at the property line**

- Level 1 <50 OU/m<sup>3</sup>**
- Level 2 50 – 100 OU/m<sup>3</sup>**
- Level 3 >100 OU/m<sup>3</sup>**

# Real-Time Odour Monitoring



# Odour Logging



OdoWATCH



Log Out

01/12/2011

16

30

Confirm

Current Monitoring Mode:

Compost

Event Based Information

Alert Points

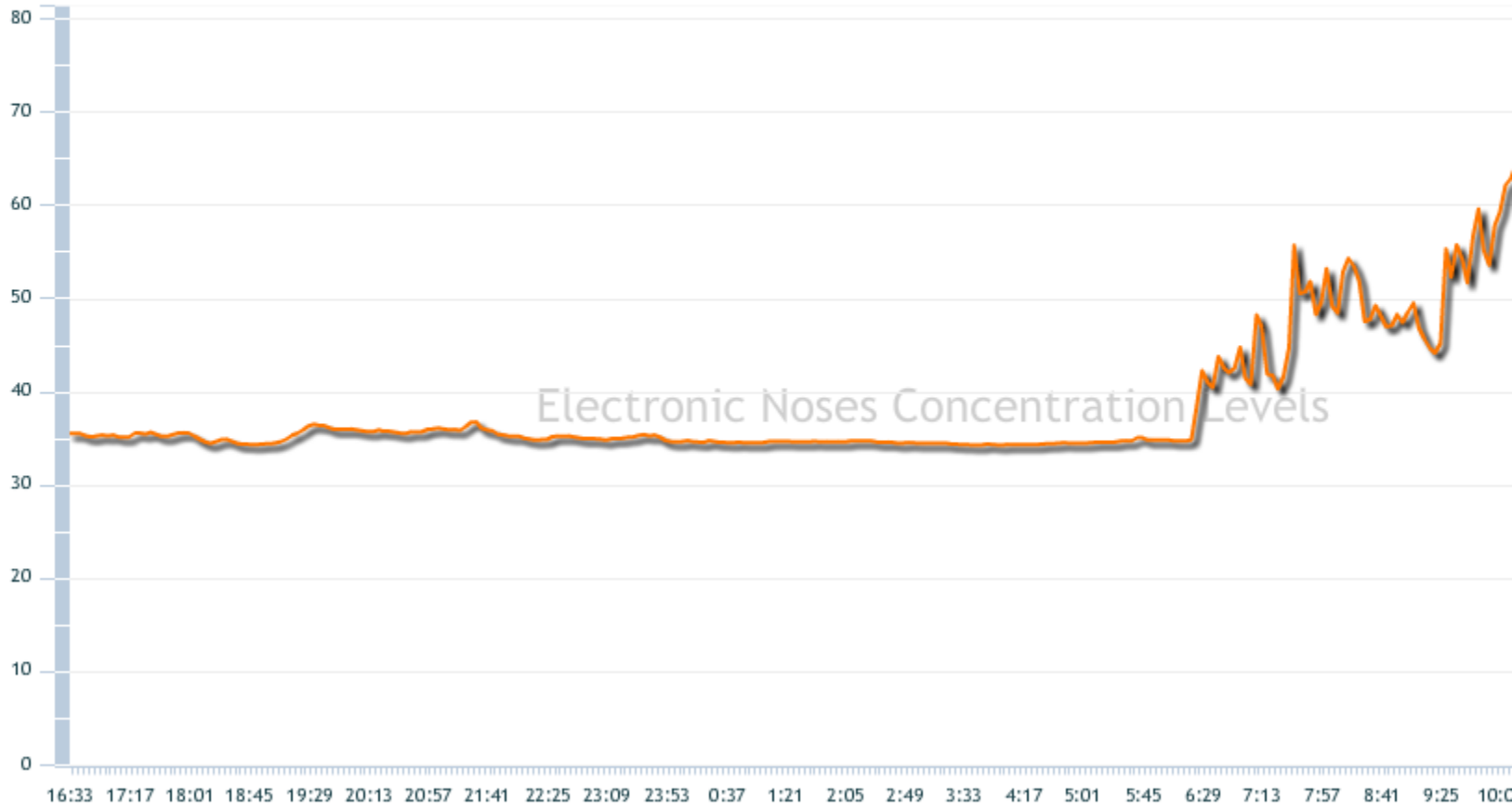
Electronic Noses

Flow Rates

Time

01-East

02-North

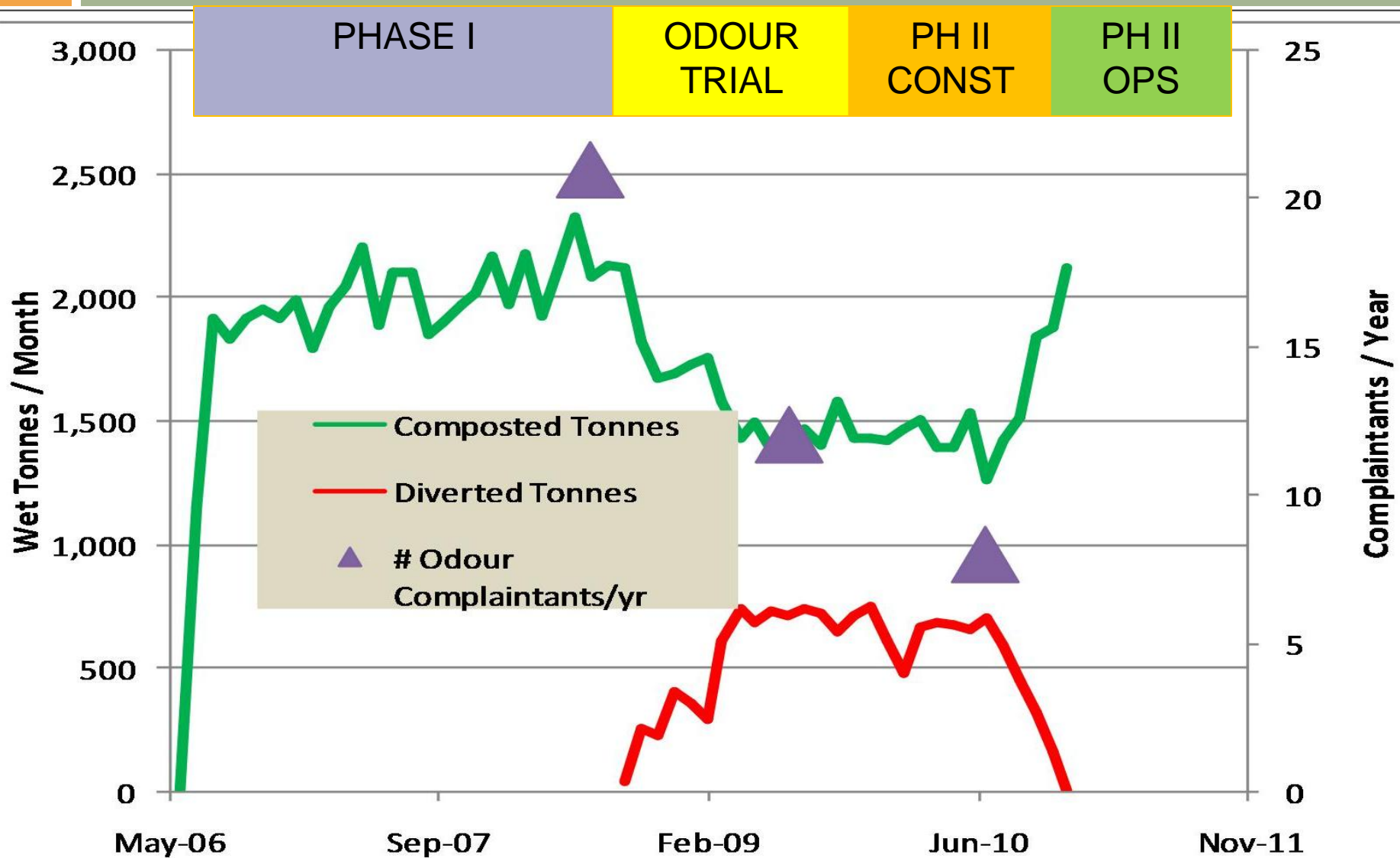


# What Made the Biggest Difference?

---

- **Leachate Control**
- **Addition of Biofilters**
- **Adequate Capacity**
- **BMP Mix**
- **Watering the Top Cover**

# Project Time-Line





---

engineered **COMPOST** systems

