# Thinking Outside Linear Compliance

*Permit Efficiency through Multi-Discipline-icity*

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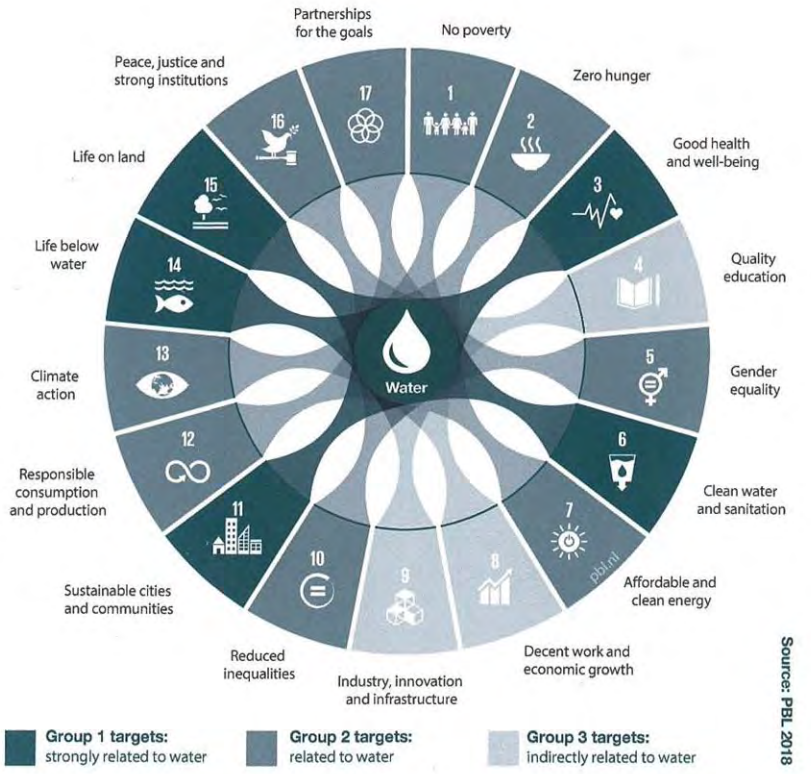
# Integrated Water Resources Management

Process that promotes the coordinated development and management of water, land, and related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems.

*Global Water Partnership, 2000*



# Bordeaux – Home Grown Sustainability


*La Cité du Vin, 2018*

## Largest wine growing region in France

300K acres of grapes • 13,000 growers

UNESCO Heritage Region (8th century)

## Terroir – *Environment that produces wine*

Climate – Soil – Topography – Grapes -- Viticulture

Confluence of the Dordogne & Garonne

54 appellations

*"We need to be worthy of our UNESCO status."*
Franck Binard, St. Emilion Wine Council

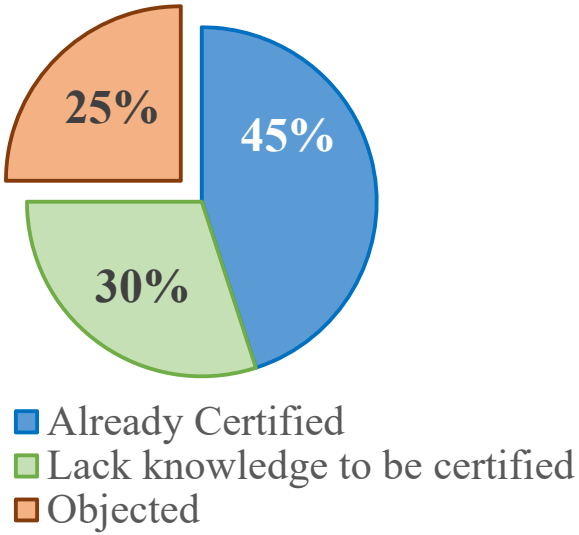
# St. Emilion Sustainable Viticulture

## Become state-certified as

## Sustainable, Organic, *or* Biodynamic by 2019

- Blanket ban on herbicides / ban on most pesticides
- Control water use
- Limit carbon footprint (solar, energy conservation)

*4 appellations*
*16.5K acres of grapes*
*3.85 M cases of wine*



# California Sustainable Winegrowing Alliance

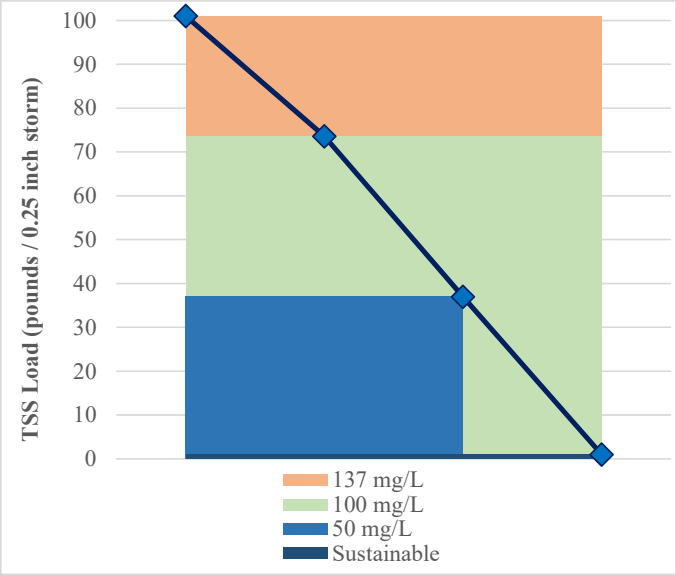
- Integrated Pest Management
- Water efficiency
- Energy efficiency

- Healthy soils
- Stewardship
- Neighbors / Employees
- Contributions


**Wine Tour Brochure*

*1,099 vineyards & 127 wineries*
*130K acres of grapes*
*211.5 M cases of wine*

# Water Quality & Sustainable Viticulture




SIC 2084:
*Wines, Brandy, Brandy Spirits*

## What-If Load Estimates:

- Volume ~ 90K gallons

  Volume = CIA
  - C=0.65
  - 0.25 inches
  - 20 acres

- SMARTS (2010-17)
  - TSS = ND to 3,690 mg/L
  - TSS $_{\text{Avg-Yr}}$ = <1 to 147 mg/L

# Water Conservation & Sustainable Viticulture

*Germany, 2018*

*France, 2018*

*Canada, 2012*

*China, 2011*

# What Else?

*What other programmatic water quality efficiencies could be associated with Sustainable Viticulture?*

# Multi-Permit Compliance & Reporting

- Storm Water NPDES Permits / TMDLs
- Sustainability

  *water conservation / efficiency*

- Waste Management

  *landfill diversion – organics, recycling*

- Climate Action Plan

  *energy efficiency, GHG emissions*

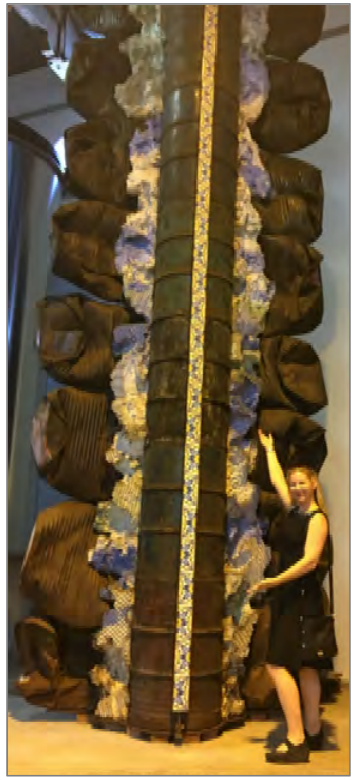
# Trash—Waste Regulatory Nexus

| | | | |
|---|---|---|---|
| **STORM WATER** | SWRCB / RWQCB | Zero trash discharged to Receiving Water, 2028 (>5mm) | |
| **GLOBAL WARMING SOLUTIONS ACT** | Air Resources Board | 2020:<br>2050: | Reduce green house gas (GHG) emissions to 1990 levels<br>Reduce GHG to 80% below 1990s levels by 2050 |
| **WASTE MANAGEMENT (AB 341, AB 1826)** | Cal-Recycle | 2020: | 75% landfill diversion (reuse, reduction, recycling goal)<br>50% organic waste reduction from 2014 levels |

ZERO WASTE PLANS

# Zero Waste Management in Viticulture

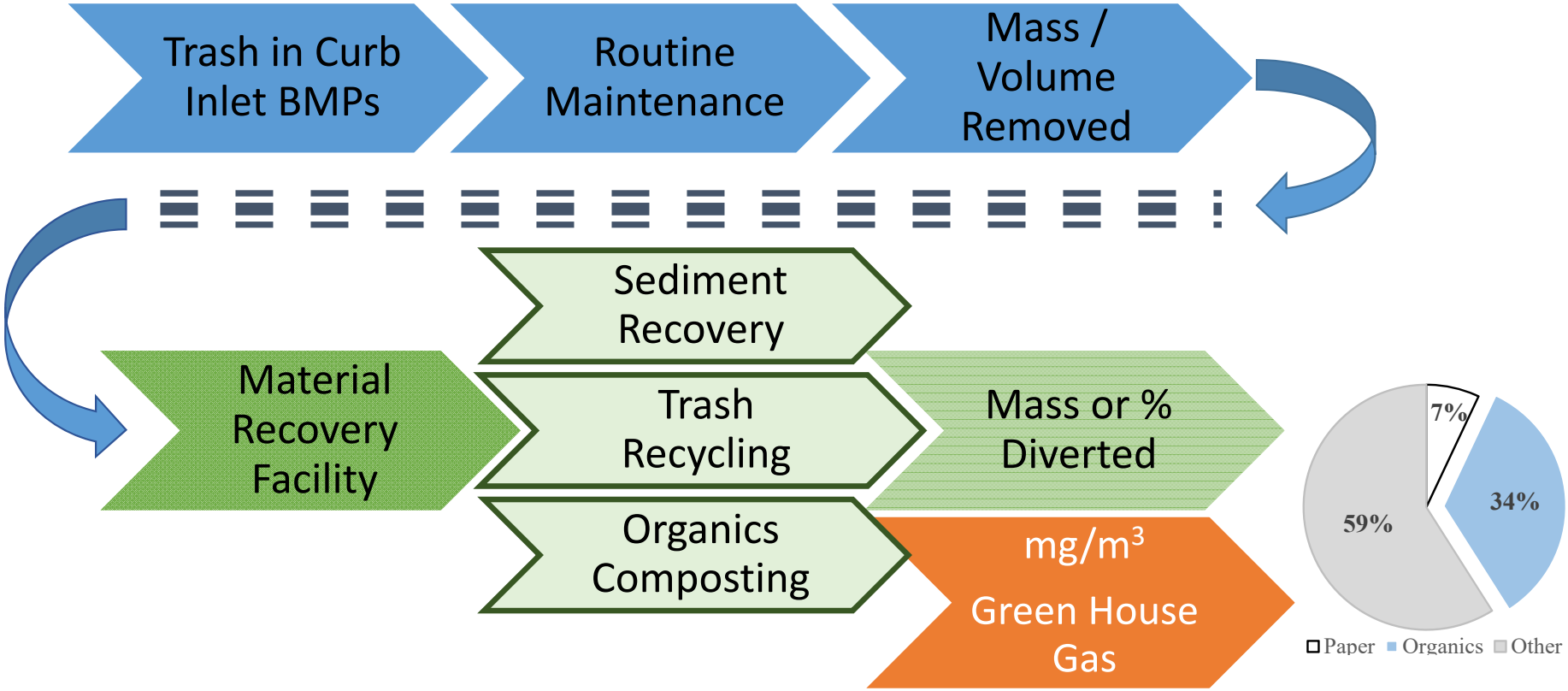
| | | |
|---|---|---|
| **Trash** | ⇔ | Recycling,<br>Re-use |
| **Grape marc** | ⇔ | Fertilization,<br>Industry applications |
| **(Waste) water** | ⇔ | Irrigation |
| **Sludge** | ⇔ | Nutrients,<br>Biogas |
| **Stalks** | ⇔ | Fertilization,<br>Industry applications |



# Incentivizing Programs

- Promote simple do-able behaviors & Target industries most ready to act.
  - *Leverage what's already there!*
  - *Be tangible.*
- Know the benefits / barriers to success.
- Make participation a win-win.
  - *Financial incentives.*
  - *Marketing incentives.*
  - *Make sharing data / lessons learned easy.*

# From Trash Amendment to Landfill Diversion

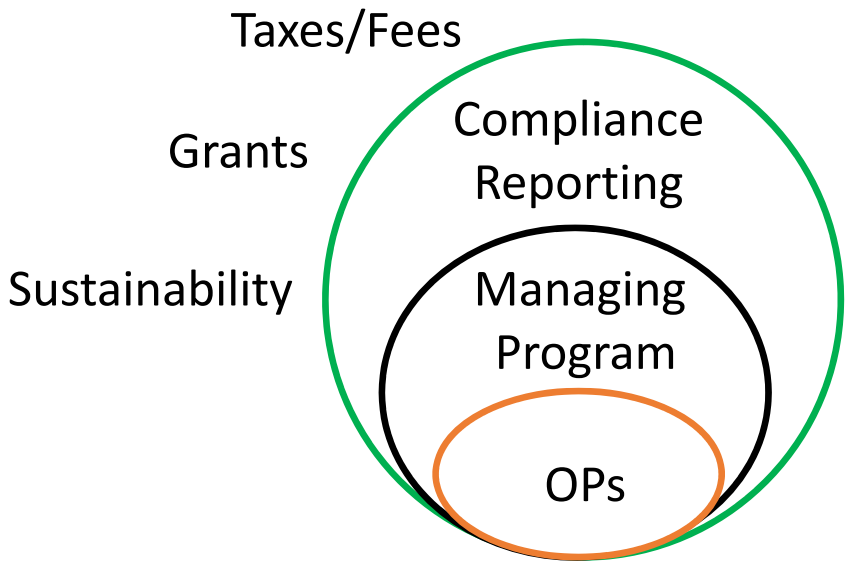


# DOT Ops – Sweeper & Decanting Waste

| SC-7, Construction BMP Manual 2013 | SC-7, Construction BMP Manual 2017 |
|---|---|
| Daily | Within 1 hour / 24 hours |
| If not mixed with debris or trash, consider incorporating the removed sediment back into the project. | After sweeping is finished, collected material may be stockpiled. If not mixed with debris, trash, or potentially hazardous, consider incorporated the removed sediment back into the project, if approved by the RE. |
| ...properly dispose of sweeper wastes at an approved dumpsite. | Sweeper material must be disposed in compliance with waste regulations. |

# Tracking Trash-Waste Nexus

- Study Question
- Data Collection
- Data Management
- Levels of Quality
- Limits of Use



# Innovation – Vision through many Prisms

*Innovation =*

*Melding many stakeholders to produce and test (and frequently discard) new ideas*



- *Meld traditional industry with academia*
- *Discover new types of innovation (behavioral sciences)*
- *Nature Based Solutions*
- *Meld Green / Gray infrastructure*
- *Apply adaptive management (circular approaches)*

# Discussion time over wine?

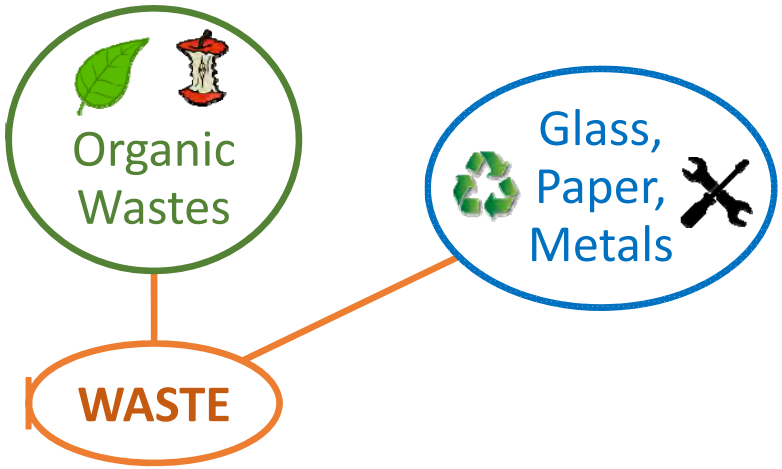
Thank you!

# ADDITIONAL SLIDES

# Waste Material Recovery Facilities

## ORGANIC WASTE SITE (COMPOSTING … *biogas*…)

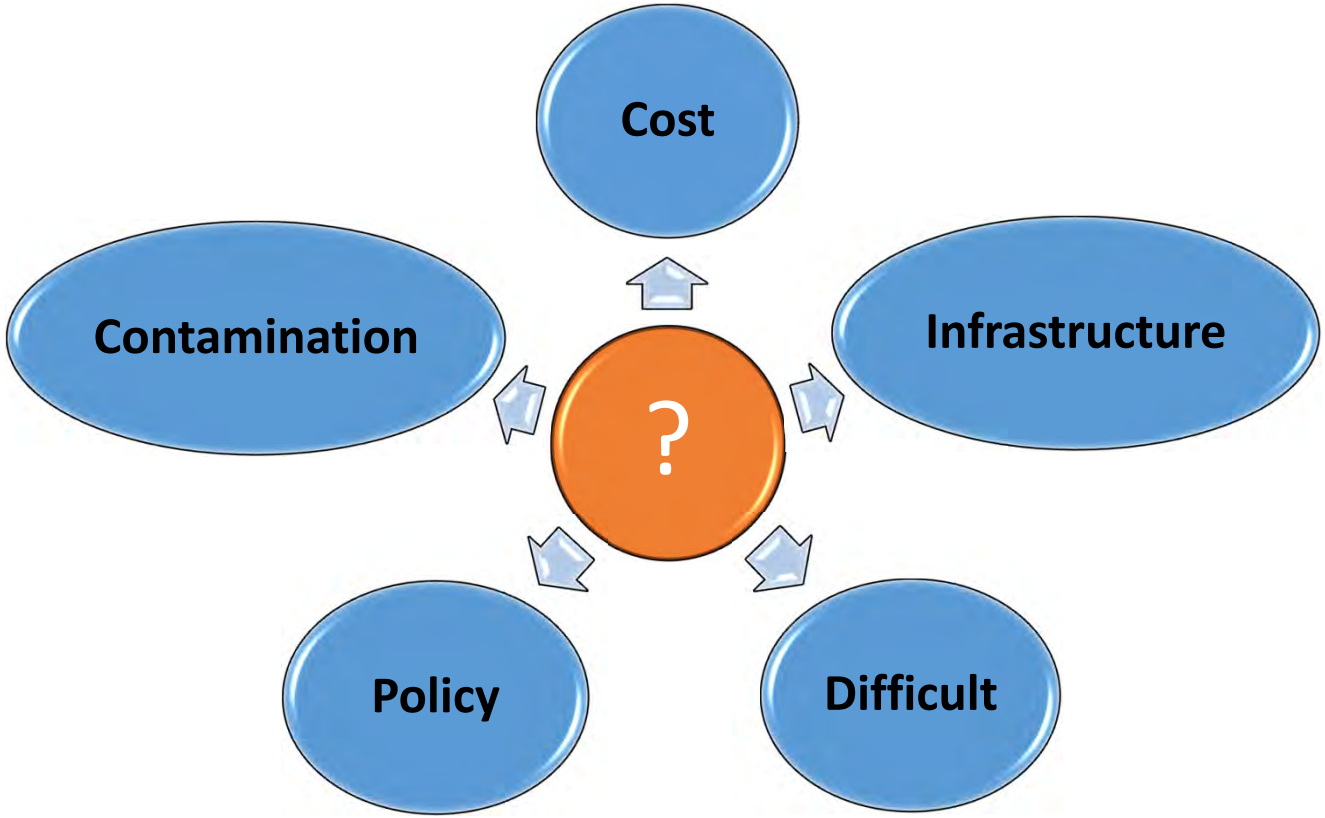
Waste Separation at Site → Scheduled Pick-Up → Composting → Use / Marketing / Shipping




## MATERIAL RECOVERY FACILITY

Receiving → Screening → Sorting → Baling → Marketing → Shipping

# Barriers to Trash—Waste Efficiencies



# Standard Sustainable Viticulture Foci

- Cover crops
- Canopy management
- (Pest) scouting
- Spray management (IPM)
- Apply nutrition for need
- Water management

# Savings to the Vineyard

| Category | Sustainable Approach | Standard Practice $ | Sustainable Practice $ | Potential Savings |
|---|---|---|---|---|
| Integrated Pest Control | Track climate, target use of Powdery Mildew spray | $65,000 to $75,000 | $100 to $400 | > $100K / Year |
| | Inspections w/ targeted application of plant-appropriate control | $1,470 (21 ac) | $140 (2 ac) | $1,330 / Application |
| Energy Efficiency | Power water pump with 3kW solar panels | Pays for itself in ~ 7 years<br>$2,000 per year in revenue thereafter | | |
| Soil Health / Zero Waste Program | Compost organic waste; reintroduce into vineyards as fertilizer | Saved $388,000 / year (disposal costs);<br>Revenue for recycling | | |