Chesapeake Bay Restoration

“Volkswagen Settlement” Emission Reduction BMP

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Volkswagen Clean Air Act Civil Settlement[1]

- Through a series of three partial settlements, EPA resolved civil enforcement case against "Volkswagen" (Volkswagen, Audi, Porsche)
- Addressed vehicles containing 2.0 and 3.0 liter diesel engines.
- Settlements resolved allegations that Volkswagen violated the Clean Air Act ("CAA") by the sale of approximately 590,000 model year 2009–2016 diesel motor vehicles equipped with "defeat devices", computer software designed to cheat on federal emissions tests.
- Through three partial settlements, "Volkswagen" agreed to pay $16.35 billion to settle allegations.
- Major excess pollutant at issue is oxides of nitrogen (NOx) and is a serious health concern as a precursor to ground level ozone and to fine particulate matter (PM2.5), both damaging to the lung.

[1] https://www.epa.gov/enforcement/volkswagen-clean-air-act-civil-settlement#mitigation

Elements of the Settlement

- Vehicle Recall
- Mitigation
  - Eligible mitigation actions include projects to reduce NOx from heavy duty diesel sources with beneficiaries having flexibility to choose projects and actions that are the best options for their citizens.
    - Replacement or repower of medium and heavy-duty trucks, school/transit buses.
    - Engine repower for freight switcher locomotives, ferries, tugs, forklifts, and port cargo handling equipment.
    - Install ocean going vessel shorepower.
    - Charging infrastructure for light duty zero emission passenger vehicles.
- Zero Emission Vehicle (ZEV) Investment
  - The CAA 2.0 liter partial settlement requires Volkswagen to invest in ZEV charging infrastructure and in the promotion of ZEVs.
- Health Effects and Environmental Benefits
- Civil Penalty for violations of the CAA and conjunctive relief to prevent future violations.

Elements of the Settlement

- All states, DC, non-government entities were allocated a portion of the trust based on the number of violating vehicles in their jurisdiction.
- Each jurisdiction had to file as "beneficiaries" to receive their allocations providing high-level summary of how they intend to spend their allocated funds.
- All requests for funding made by beneficiaries had to be approved by a court-appointed Trustee.
- Trust funds can only be spent on ten categories of eligible mitigation projects defined in the final settlement agreements.

Crediting Load Reductions from Emission Reductions

- To estimate the effect that a change in emissions has on deposition to the watershed and, in turn, loads to the tidal Bay, the CBP Modeling Workgroup published "Influence of Volkswagen Settlement Agreements on Chesapeake Water Quality"[2] in 2018.
- The analysis applies to all tracked actions beyond forecasted CAA benefits built into each jurisdictions' WIPs that reduce nitrogen emissions, deposition, and loads.
- Credit for emission reductions are attributed directly to the state that implemented the management practice.

[2] Influence of Volkswagen Settlement Agreements on Chesapeake Water Quality, August 20, 2018

Crediting Load Reductions from Emission Reductions

- The nitrogen load reduction to the tidal Bay from reduced NOx emissions is relatively small because of loss mechanisms in the atmosphere, on land, and in Chesapeake watershed streams and rivers.
  - About 50% of the NOx emitted in in the CB watershed falls back to the watershed, with the remainder transported beyond the watershed boarders.
  - Of the 50% deposited throughout the CB watershed, about 90% is taken up by plants and soil or is denitrified.
  - After transport from the land to streams and rivers, about another 25% is lost through riverine denitrification and other mechanisms.
  - Therefore, the total nitrogen contribution to tidal waters is a few percent of the original NOx emission reductions.

Crediting Load Reductions from Emission Reductions

Percentage of emitted oxidized and reduced nitrogen that reaches the tidal waters[2]

	Emitter					
	DE	MD	NY	PA	VA	WV
Reduced	5.27%	11.17%	2.43%	6.70%	8.93%	4.96%
Oxidized	1.83%	4.13%	0.83%	2.43%	3.36%	1.74%

[2] Influence of Volkswagen Settlement Agreements on Chesapeake Water Quality, August 20, 2018

Crediting Load Reductions from Emission Reductions

- Pennsylvania's Final Beneficiary Mitigation Plan[3] proposes 55,525,940 pounds of NOx emission reductions.
- Of these reductions, only 2.43%[2] of this load reduction will reach the tidal estuary.
- After stoichiometric transformation from NOx to nitrogen, a reduction of 410,798 pounds of nitrogen will be realized through Air Program reductions related to the Volkswagen Settlement that are beyond planned Clean Air Act reductions.
  - Air programs typically measure NOx as a molecular mass (counting all elements of nitrogen and oxygen in their correct ratios). For water programs, the nitrogen mass is always measured "as N" (only the nitrogen elemental mass is counted in the different nitrogen nutrient species such as nitrate, ammonia, or organic nitrogen.)

[3] https://files.dep.state.pa.us/Air/Volkswagen/FinalBeneficiaryMitigationPlan5-4-18.pdf

Crediting Load Reductions from Emission Reductions

- Proposal 1 for the WTWG is to attribute edge-of-tide (EOT) load reductions associated with emission reductions to all land uses with acres in the relevant jurisdiction with the exception of CSS (Combined Sewer System).
  - EOT reduction is proportioned to all segments and land uses in the state according the relative acres.
  - Same method as other load-reduction (lb) BMPs – Storm Drain Cleaning, Dirt & Gravel Road E&S, etc.
- Load changes to feed space for 1) Ammonia Emission Reduction BMP and 2) Manure Treatment Technology BMPs are applied in that order. Should VW Settlement BMP go before or after those calculations?

Crediting Load Reductions from Emission Reductions

- Proposal 2 is to apply EOT load reductions to shoreline load for the VW Settlement BMP.
  - Shoreline loads can be negative and that would be the case for NY, PA, WV and DE if data are provided for the BMP.

Crediting Load Reductions from Emission Reductions

- Initially, VW Settlement BMP is to accurately account for the mitigation efforts noted in PA's Final Amended WIP – for planning.
- Credit for progress scenarios would be part of updates to regression equations that relate measured atmospheric concentrations to precipitation throughout the watershed.

Crediting Load Reductions from Emission Reductions

- The name is currently "VW Settlement BMP" and units are lbs of TN. Alternative name to something more generic?
  - Over the years, several major auto manufacturers – including GM, Ford, and Honda – have payed fines and recalled vehicles for using defeat devices.
- The BMP will also need to go in the BMP summary report. It is a cross-sector BMP so a proposal is to re-name the "Land Policy" section to "Policy" and add the emission reduction BMP.
- What to we use for cost data?
- Approved process needs to be integrated with CAST by the CBP office IT team.