

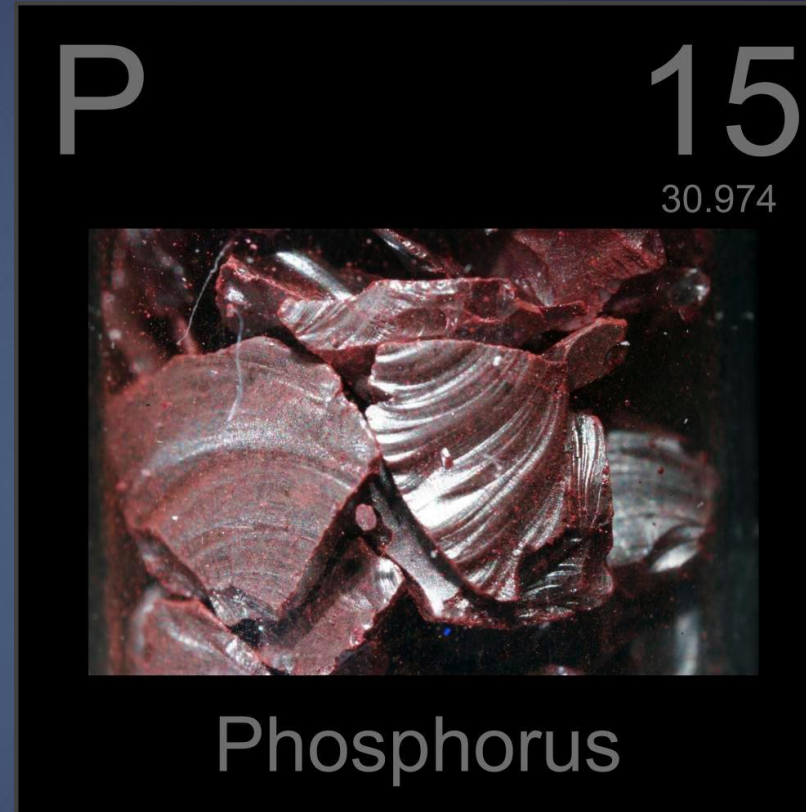


Phosphates: How they impact your discharge

PRESENTED BY: ROBIN DEAL

Interesting Facts about Phosphorus

- ▶ Phosphorus is the 15 element on the periodic table
- ▶ It is essential to all life with the average human body containing 26.5 ounces
- ▶ The average adult excretes 1.3-1.5 grams per day
- ▶ Means bringer of light



Uses for phosphorus



Eutrophication

- ▶ Caused by excessive phosphorus in water
- ▶ Algae Blooms
- ▶ Toxins from algae
- ▶ Fish Kills
- ▶ Odors
- ▶ Foul tastes in drinking water supply
- ▶ Unpleasant to see
- ▶ Lakes are closed to public



[This Photo](#) by Unknown Author is licensed under [CC BY-SA](#)

EPA STEPS IN TO FIX THE PROBLEM

- ▶ Clean Water Act of 1972 gave the EPA permission to establish guidelines for water and wastewater
 - ▶ EPA establishes standards for wastewater discharge of phosphates to receiving bodies of water:
 1. Streams and Rivers 0.1ppm
 2. Streams entering lakes 0.05ppm
 3. Lakes and Reservoirs 0.025ppm
-

What the EPA Recommends

The EPA guidelines for nutrient management recommend that P.O.T.W.s charge surcharges whenever the following limits are not met:

- ▶ BOD limit of 210ppm with a surcharge of \$0.232 per pound
 - ▶ TSS limit of 230ppm with a surcharge of \$0.186 per pound
 - ▶ Total Nitrogen limit of 30ppm with a surcharge of \$1.17 per pound
 - ▶ Total Phosphorus limit of 12ppm with a surcharge of \$1.32 per pound
-

How do SURCHARGES work

- ▶ An industry is given a permitted amount of phosphorus they can discharge (example: 15lbs per day with a total discharge flow of 150,000GPD)
 - ▶ Formula for converting pounds to ppm:
 $\text{ppm} = \text{pounds of chemical} / \text{MGD} \times 8.34$
 - ▶ $11.99 \text{ ppm} = 15 \text{ lbs of P} / .15 \text{ MGD} \times 8.34$
 - ▶ ppm=12 phosphorus can be discharged to meet permit, anything more can carry a surcharge per EPA recommendations
-

How do you remove phosphorus?

Chemical Removal

- Calcium reacts with alkalinity to form calcium carbonate. At a pH over 10 the excess calcium bonds with phosphorus to precipitate as hydroxyapatite
 - Copperas, or iron, bond with phosphorus to form iron phosphate which easily precipitates out
 - Alum works much like calcium, but its usage will be based upon removal requirements
-

Chemical Phosphate Removal

- ▶ Research is being done on new technology
- ▶ Long track record of proven success
- ▶ Readily available
- ▶ Easy to do
- ▶ Systems can be small foot-prints
- ▶ Can be cost effective



Biological Removal (BPR)

- ▶ Bacteria capable of storing phosphorus as polyphosphate are PAO
 - ▶ Different set-ups for systems
 - ▶ In industrial applications, used as a “Final Polish” to achieve permit limits
-

Biological Phosphate Removal

- ▶ Research is being done on new technology
- ▶ Proven to be efficient
- ▶ Multiple types of systems to chose from
- ▶ Training is readily available to new operators



So...What's the future look like?

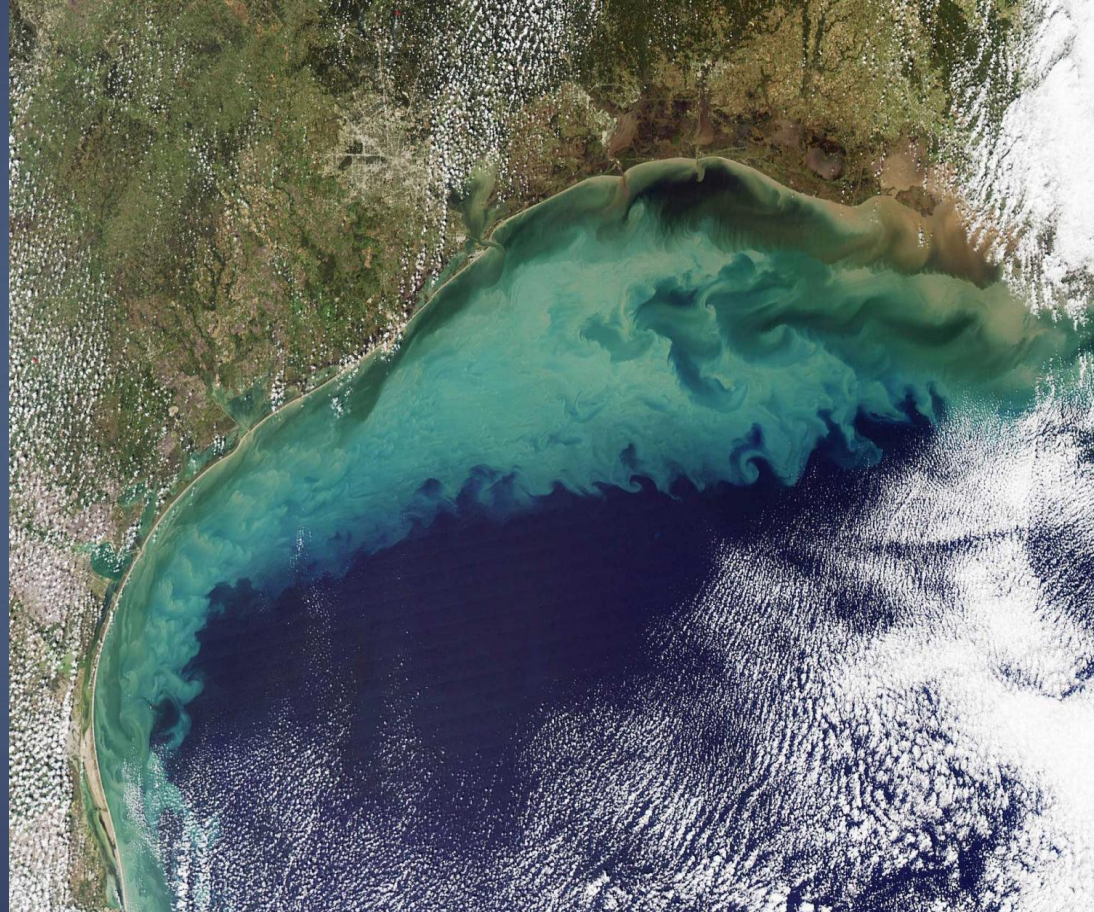


We want a clean environment

- ▶ Hypoxia Task Force- 11 states and the EPA working together to reduce the size of the Gulf of Mexico's DEAD ZONE
 - ▶ Industries are driving research for better practices from non-phosphate cleaners to alternatives to phosphate-coatings
 - ▶ Nutrient Management Plans- each state is working on a tailored plan for recovery of impaired waters
-

Gulf of Mexico Hypoxia Task Force

- ▶ Largest Hypoxia Zone in United States
- ▶ Task force established in May, 1998 with Charter
- ▶ Members are Federal, State and Tribal
- ▶ Working to solve the problem



Industry Driven Research

- ▶ Non-phosphate cleaners are being widely used
 - ▶ Zirconium is replacing phosphate in paint-prep lines
 - ▶ Phosphate recovery systems are being utilized
 - ▶ New Technologies for phosphate lines are coming
-

Nutrient Management Plans





AquaPure

House Calls for Industrial WasteWater

For more information visit
Robin Deal in Booth #348

www.hubbardhall.com

connect with us on Twitter and LinkedIn