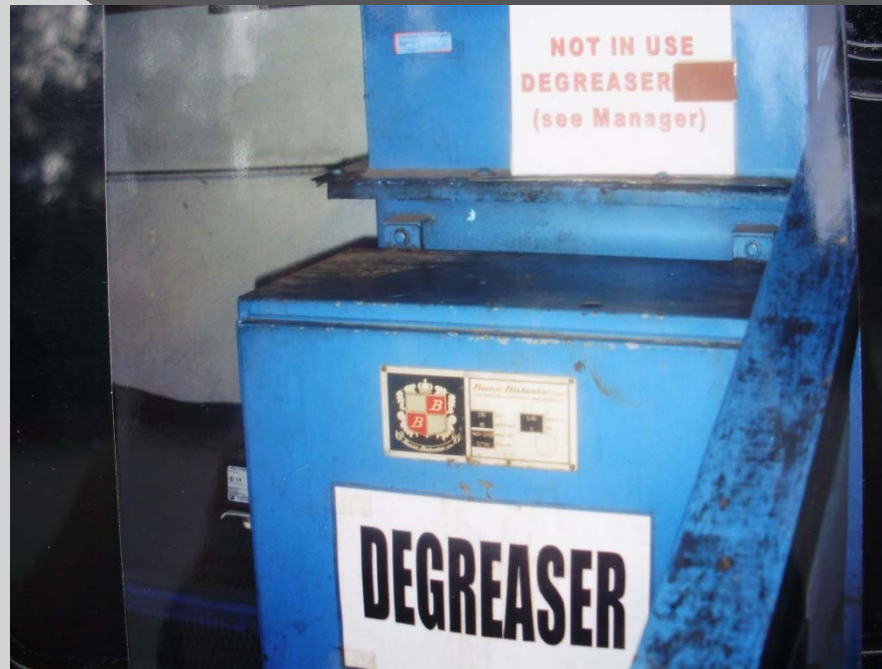


# Technical Solutions: Safer Feasible Alternatives

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# IRTA Approach to Finding Alternatives

- Investigate and work with selected industry, determine use characteristics and figure out what alternatives might work
- Variety of options
  - › Eliminate need for operation
  - › Substitute process alternative
  - › Substitute chemical alternative
- Test alternatives
- Evaluate performance and cost
- Examine health and environmental effects
- Worker toxicity is most serious issue

# Background on Exempt Chemical Issue

- Exempt chemicals can be used as chemical alternatives
- EPA exempts chemicals based only on reactivity whereas California considers other factors
- When SCAQMD exempts a chemical, formulators and users use it extensively
  - › VOC limits are low
  - › Drop-in substitution is easiest way to comply
  - › Believe exemption is stamp of approval to use
- District needs policy for exempt chemicals that takes into account increased worker exposure

# Examples of Eliminating Need for Operation

- ◎ Company making silicone implantable medical devices
  - > Converted to high density polyethylene pots and eliminated need for cleaning
- ◎ Schools and public buildings using floor wax strippers to remove wax from VCT floors
  - > Use alternative flooring or coatings that don't require waxing or stripping
- ◎ Company making boat hulls using molding process
  - > Convert from wax based release agent to water-based liquid release agent and eliminate need for cleaning molds with styrene



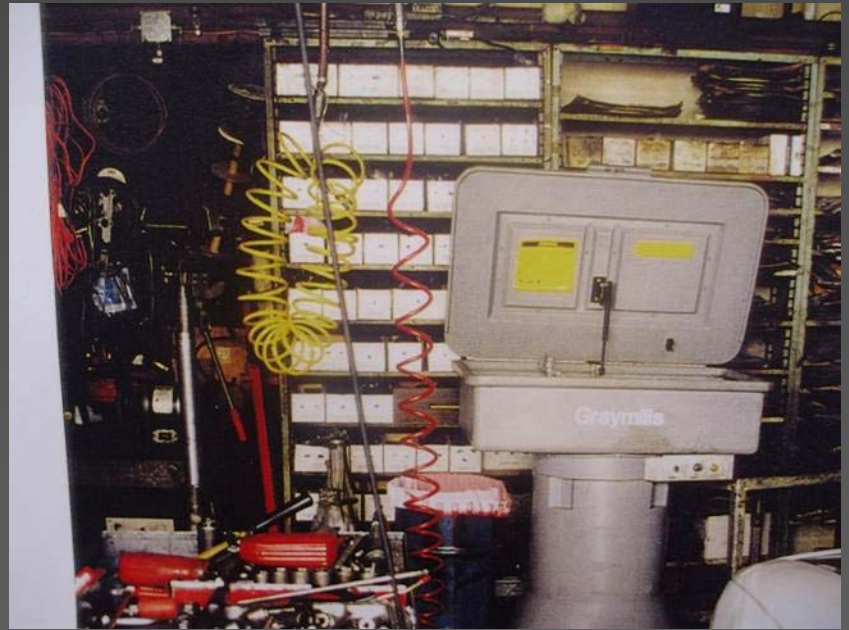
# Examples of Process Alternatives

- Companies using methylene chloride paint strippers or agencies using graffiti removers
  - › Convert to abrasive blasting operations
- Companies using solvents for vapor degreasing and cold cleaning operations
  - › Convert to water-based cleaning systems
- Companies using methylene chloride or n-propyl bromide adhesives for foam fabrication, mattress manufacturing or upholstered furniture manufacturing
  - › Convert to water-based or hot melt adhesive













# Examples of Chemical Alternatives

- Companies using VOC lubricants
  - › Convert to water-based or vegetable based lubricants
- Companies making asphalt, contractors applying asphalt using diesel release agents
  - › Convert to recycled vegetable oil
- Contractors using VOC release agents for concrete stamping
  - › Convert to petroleum based lubricant
- Furniture strippers using methylene chloride based stripping formulations
  - › Convert to benzyl alcohol formulations
- Consumers, shops using VOC, toxic auto aerosol cleaners
  - › Convert to acetone formulations with carbon dioxide propellant











# Challenges in Choosing Chemical Alternatives

- ◎ Best option is to select very low VOC content options like vegetable based material
  - › Likely to be low in toxicity
- ◎ Another option is to exempt chemicals and select them as alternatives
  - › Some chemicals have toxic endpoint
    - Don't exempt them (TBAC, DMC)
  - › Some chemicals have very little toxicity information
    - Precautionary principle indicates they shouldn't be deemed exempt (PCBTF)
  - › Some chemicals are low in toxicity
    - They can be exempted (acetone)

# Major Factor to Consider

- ◉ Exempting a chemical from VOC regulations gives it preference and indicates District thinks it should be used in place of other options
- ◉ Deciding not to exempt a chemical is not the same as banning it or restricting it
  - › Suppliers can still formulate with it and users can use it
  - › It is just counted as a VOC

# Results and Conclusions

- ◎ IRTA focuses on finding cost effective alternatives that perform well for range of different solvent applications
  - > Options include eliminating the need for the operation altogether and using process alternatives
  - > If chemical alternative is needed, rely on very low VOC content materials and exempt chemicals with known, low toxicity
- ◎ Chemicals with toxic endpoints and chemicals with unknown toxicity do not need to be used and they should not be exempted
  - > Safer alternatives can be found without giving them preference

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