33rd Annual AWMA Joint Florida/Alabama Technical Conference

Recent Supply Chain Challenges Panel – Problems and Opportunities

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Problems:

Increasing incidence of FedEx not delivering overnight in the morning- sometimes not for a few days - As a result hexavalent chromium water samples out of holding times – Resample? Analyze and flag results?

Vehicles not available for rental/purchase. Unable to efficiently progress projects, loss of revenue

Numerous chemicals in short supply, long lead times, unacceptable quality. Unable to meet project timelines, increased costs.

Opportunities:

Embrace the circular economy by Upcyling – This can positively impact sustainability goals of entities and ofter resuce costs.

Redesign projects to use alternate materials

Upcycling: Repurposed Materials

What is Upcycling?

Upcycling means used materials are converted into something of higher value and/or quality in a second life.

Benefits of Upcycling

- Reduces the amount of landfill waste
- Helps to reduce energy use
- Reduces in air and water pollution
- Increases support of local industries
- Encourages innovation and creativity

Repurposed Material Use Considerations

- Approvals to use classes of materials and propriety products
- Consider reuse of decommissioning/demolition material
- Find and incorporate repurposed materials

Finding Materials for Repurposing

- Virgin amendment suppliers (returns, off-specification batches)
- Waste streams
- Repurposed material vendors or arrangers
- Local business groups

CASE STUDY #1

Repurposed Attic Fans Used for Soil Vapor Extraction

- Repurposed attic fans used to increase value of land
- Cost saving US $300 vs. new fans
- Cost savings approximately US $2M vs. waiting until redevelopment

CASE STUDY #2

Repurposed Materials Used Fatty Acids

- Chlorobenzenes were present in saturated soils and groundwater in Belize
- Following in-house bench studies, fatty acids were chosen for insitu remediation
- Suppliers could not deliver the 80 tons of virgin vegetable oil in time to meet regulators timeline.
- Lightly used vegetable oil (fatty acids) were selected as the repurposed amendment to inject. This allowed the regulatory timeline to be met and reduced the cost of remediation.

CASE STUDY #2

Sustainable Advantages

1. Small cost reduction for client and repurposed material donators

2. Important sustainability wins for the user and donator of the repurposed materials

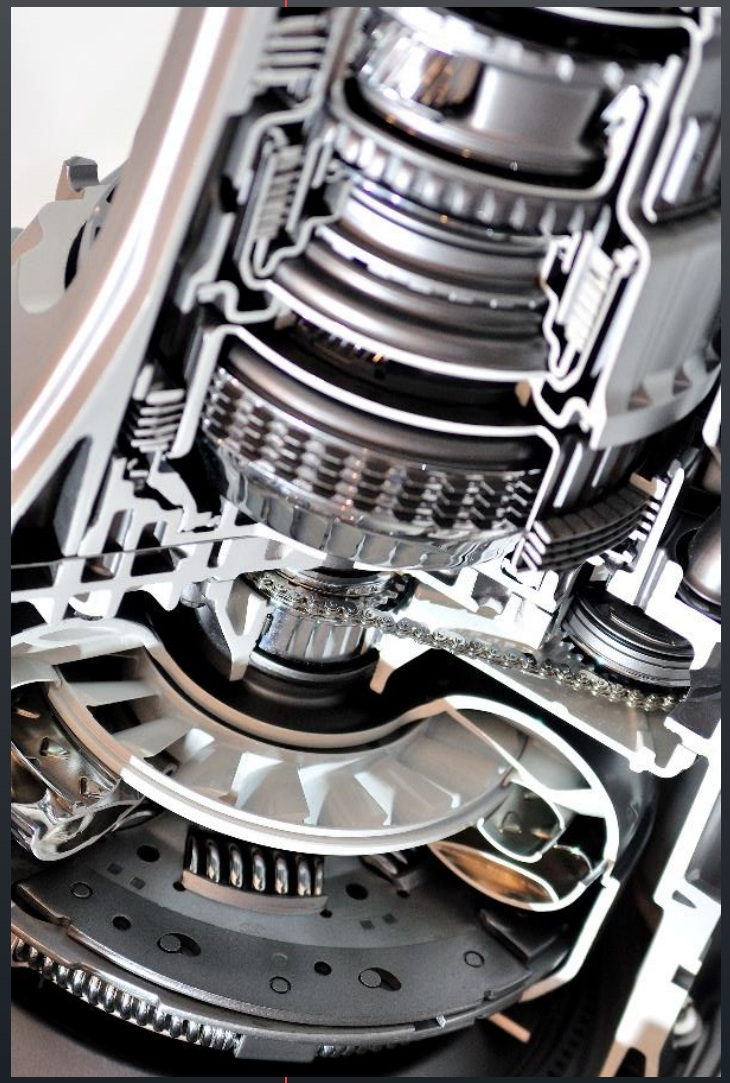
CASE STUDY #3

Repurposed Jam/Preserve Remediation of Ammonium

- Water was exiting Gin Drinkers Bay landfill in Hong Kong at about 2,000 mg/L ammonium as N
- The introduction of otherwise waste jam/preserve waste along with natural cascading reduced the concentration to below the compliance concentration
- Cost saving US$ 90,000 vs off-site disposal

CASE STUDY #4

Soil and Groundwater Improvement



Alternate remediation media:

Virgin diatomaceous earth not available – sourced used material from closed site. – Cost saving

Sodium bicarbonate certified heavy metal free not available, used more expensive potassium bicarbonate but project completed

Client interested in using repurposed material due to supply delays, agreed to use out of specification (doped with methanol) ethanol from a supplier for insitu remediation. Resulting in large cost savings and accelerated timeline for injections.

Summary

- Open our minds to material reuse in business to build social, environmental, and financial value
- Thoughtful use of repurposed materials can often be incorporated in protection of groundwater and surface waters
- Our world is constantly changing, and we must change and evolve with it. The reuse of materials leads to waste reduction, saves natural resources, decreases environmental impact, and saves money

"I think we're seeing an increasing understanding that, often, the waste that leaves the plants, is dollars leaving the plant, and a more mature, creative approach can actually yield considerable value" *- New York Times*