



Decontamination & Decommissioning:
Products, Project & Capabilities

35 Years D&D Experience

Decontamination

Demolition

Vacuum Collection

Waste Containers

Instrumentation

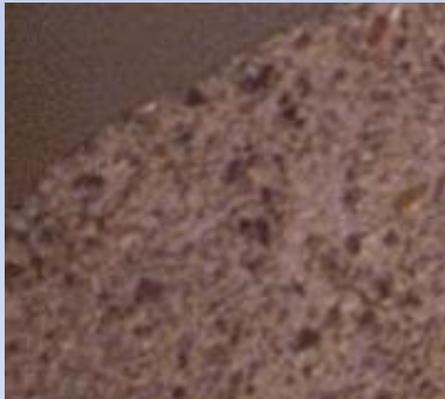
Water Treatment



Mechanical Surface Removal

Surface conditions & future disposition determine means & methods

Scabbled Concrete to 1/8-inch



UHP (55ksi) Paint Removal from Steel



Standard Decontamination Tools

Dustless, effective control of airborne emissions



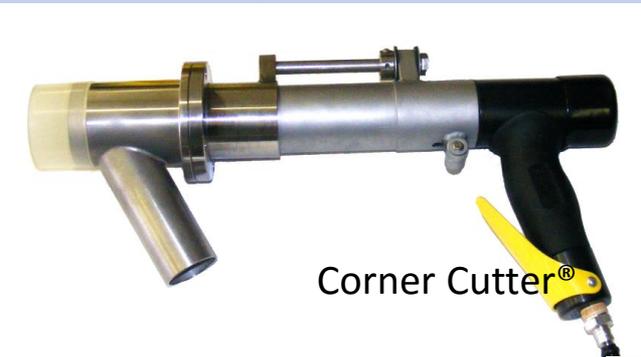
Roto Peen® Cushioned Abrasive Wheel



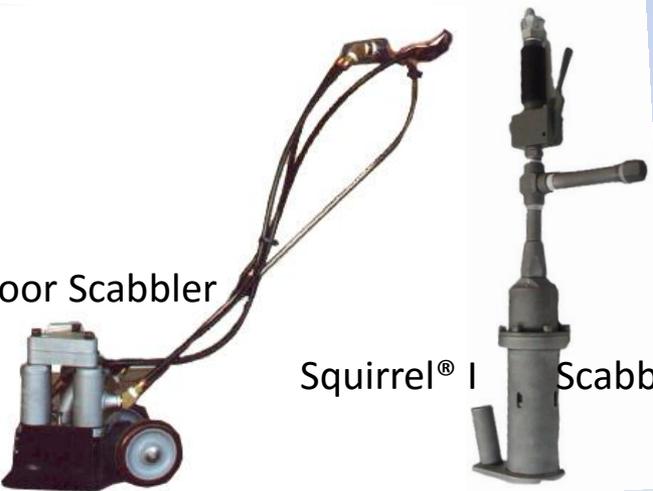
Squirrel® II Crack Chaser



Squirrel® III Floor Scabblers



Corner Cutter®



Squirrel® I Scabblers



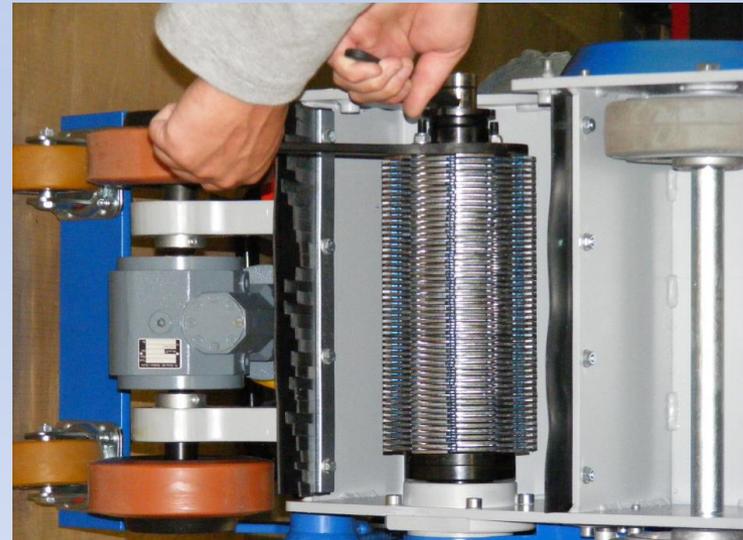
Pentek Also Offers Diamond Media for Aggressive Cutting + Surface Protection

Devices to permit fine adjustments of cutting action

Roto-Peen® Cushioned Abrasive Wheel



Diamond Abrasive Belts



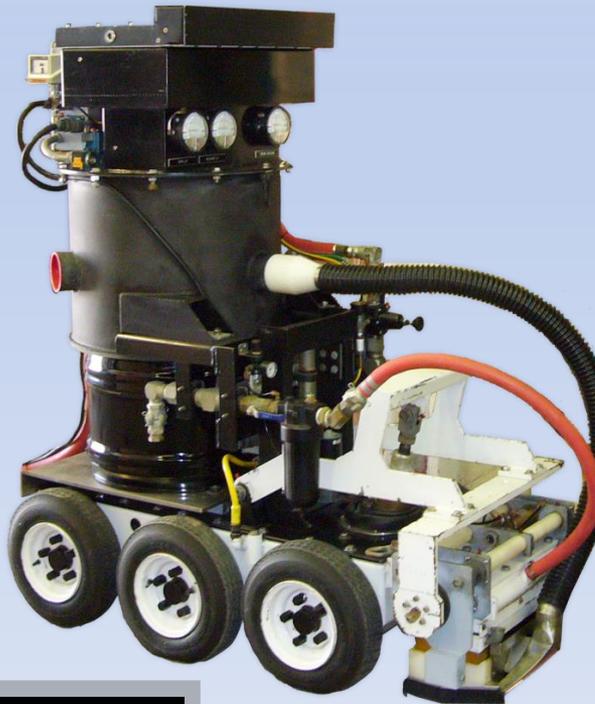
Diamond Drum Scabbler



Remote Deployment Schemes

Floors and walls, or new aerial deployment

Standard MOOSE®



WallWalker®



Aerial MOOSE®



Fukushima Unit 3, 5FL MOOSE®

Nov. 2013 deployment of Blade MOOSE® to 5FL



Source: TEPCO
Nov. 22nd,
2013



Source: TEPCO
Nov. 22nd, 2013



VAC-PAC[®] Collection Systems

HEPA filtered, high flow, low maintenance

Standard VAC-PAC[®]



Custom VAC-PAC[®]



Self-Disposing VAC-PAC[®] Module



Bulk Collection of LLW

B25 Waste Container used for “drop out” of bulk materials (shown w/ 150mm connection)



Pentek Decontamination Technology, 35 years of service to the nuclear industry.

Super VAC-PAC

6,000/hr flow; 6m³ Volume; 4.9T Maximum Load



Fully Integrated Vacuum Waste Container



Bulk Collection of Industrial Waste

For our industrial business, waste can be centrally located in a truck-compatible container

Pentek 25 yd-vacuum roll-off specs.pdf - Reader



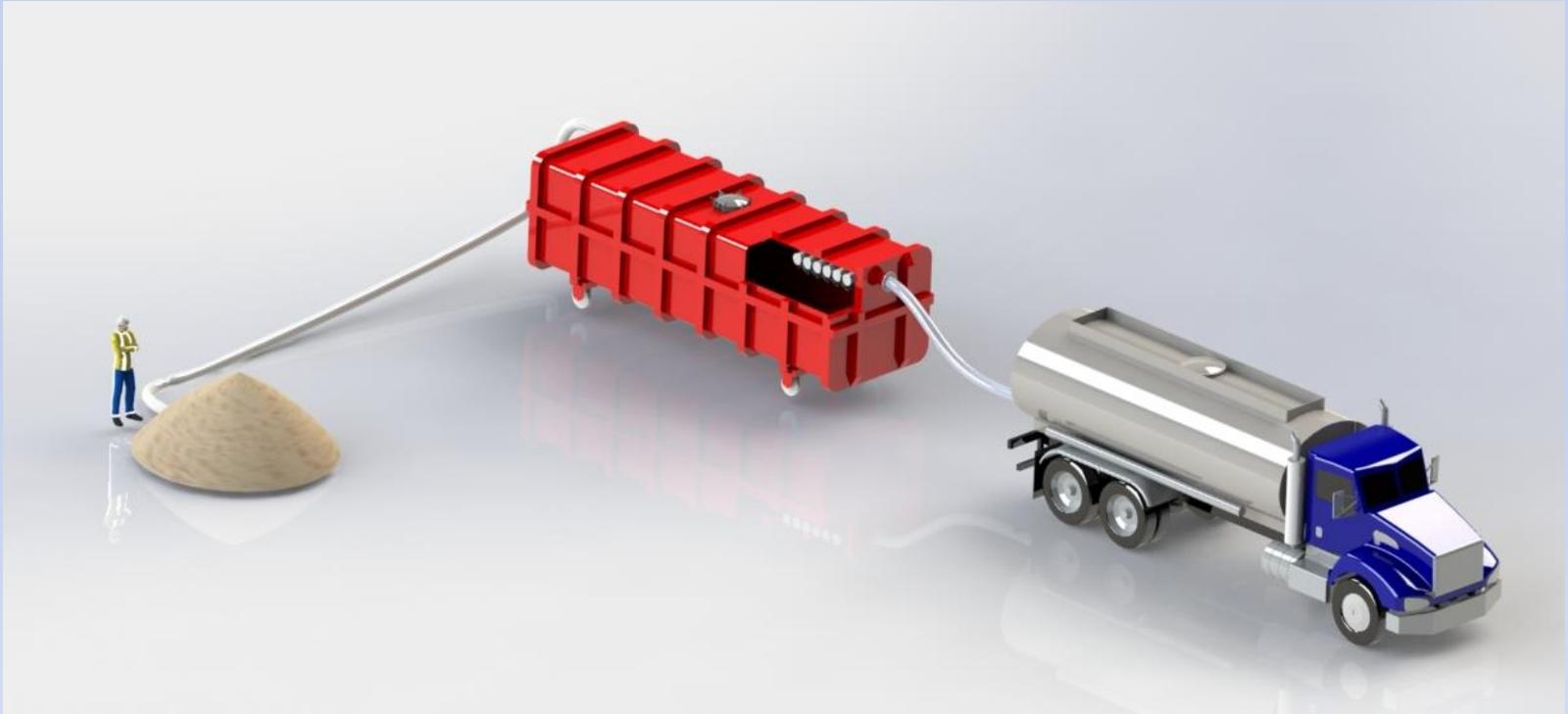
25 Yard Vacuum Box

Capacity: 25 yd (5,049 gal)
Height: 6' 10"
Width: 8'
Length: 25'
Tare Weight: 10,070 lbs



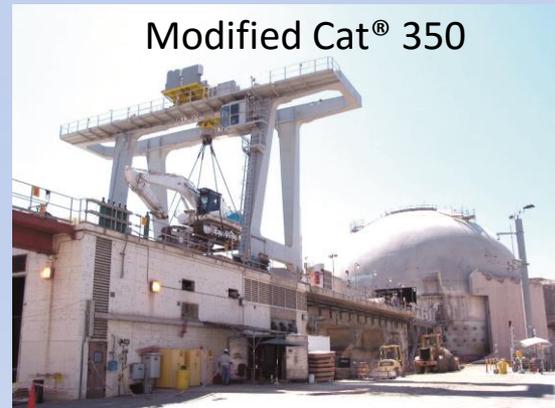
Pentek Decontamination Technology, 35 years of service to the nuclear industry.

Fully Integrated Vacuum Roll-Off Container



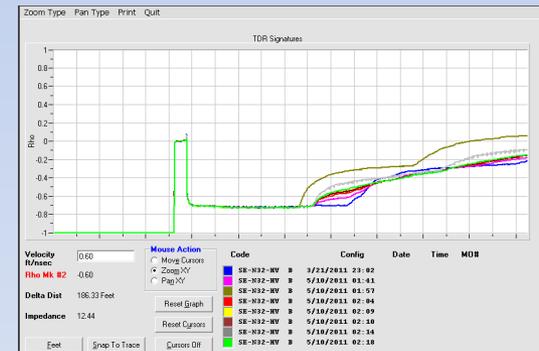
Demolition Equipment

Modifications for hazardous work locations



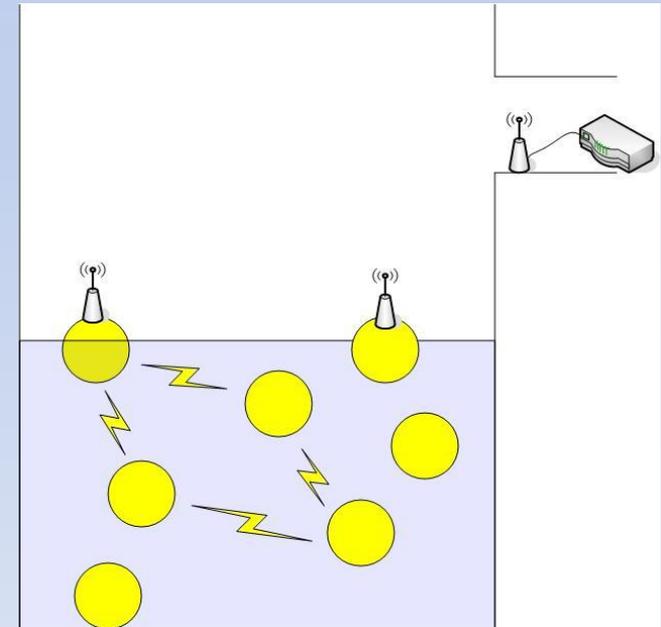
I&C and Electrical System Monitoring Programs

- Pentek provides consulting services and equipment to support electrical condition monitoring programs at NPPs
 - Troubleshooting and testing of critical circuits and systems in BWRs
 - Expertise includes nuclear instrumentation, low/medium voltage cables
 - Design specialized programs as part of license extension activities and aging management
 - Custom-designed test systems to bring research from the laboratories to the NPP
 - Example, special TDR testing to identify defective insulation areas



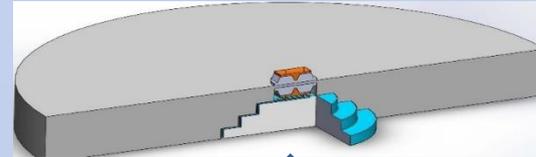
Specialized R&D Activities

- Expertise in designing communication systems to operate for in non-traditional applications
 - WIFI systems for Pentek Moose equipment at Fukushima U3 5f
 - Underwater WIFI – proposed to IRID for technologies to support internal RPV investigation



New R&D Areas

- System to monitor the environmental parameters without any mechanical or electrical penetrations
 - Static data: temperature and pressure
 - Radiation levels
 - Video
- Applications include spent fuel casks and other waste containers

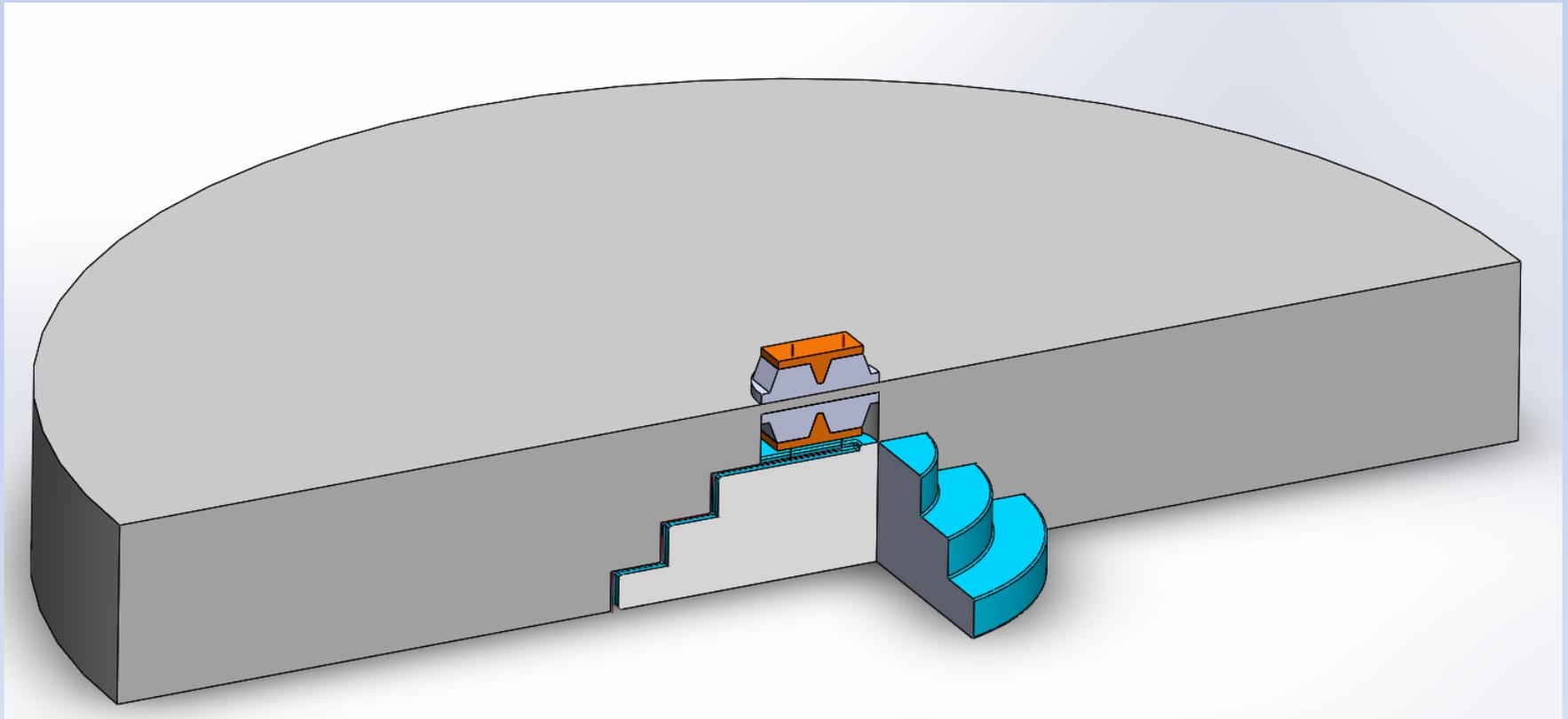


Source: NAC International



Instrumentation for Condition Monitoring

Specialized wireless devices to transmit power & data for spent fuel containers



Commercial Opportunities

Market	Potential Applications
Other DOE Applications	Monitoring internal conditions of newly deployed waste storage and treatment facilities like those at SRL, INL, WIPP and Hanford, including other facilities engaged in hot-cell related research activities.
Nuclear Power Utilities	Repurpose (and functionally replace) glands and double-sealed physical penetrations currently of used for reactor, containment and pressure vessel instrumentation and electrical power systems in nuclear power plants.
Defense/Aerospace	Communications and power transfer through hulls, fuselages, fuel tanks, etc., without mechanical penetrations. Applications include aircraft, spacecraft, submarines & surface ships.
Petrochemical/Chemical Processing	Monitoring the contents of sealed storage and processing tanks and vessels, providing enhanced isolation of hazardous materials and chemical formulations from workers, adjacent processes, and the environment.
Security	Enable video, data and power signals to be transmitted through rigid structures like walls, floors, and ceilings without structural modification to existing facilities.



Water Filtration & Treatment

Specialized mechanical filtration and treatment cartridges, filter housings, etc.



PCF SERIES
CARTRIDGES

BBF1-20MB

PCF1-10MB PCF1-20MB

PCF SERIES MIXED BED DEIONIZATION CARTRIDGES

- Designed for deionizing water up to 16 megohms
- All materials and construction are FDA-compliant
- Three sizes and capacities

PCF Series filter cartridges have been developed in response to the requirements for deionized water in many industries.

They are manufactured using an FDA-compliant resin that has been subjected to additional post-production steps to minimize the total organic carbon (TOC) level.

These high-capacity, semi-conductor-grade resin cartridges are ideal for use in pharmaceutical and medical laboratories, cosmetics, and circuit board printing applications.

PCF Series cartridges are available in three sizes, flow rates and capacities. They are convenient and cost effective for many applications

where low levels of total organic carbon (TOC) and total dissolved solids (TDS) are required.

Applications:

- Circuit board printing
- Pharmaceutical use
- Steam and humidification
- Cosmetics
- Steam processors
- Humidification systems
- Recirculating/cooling towers
- Power generating equipment
- Medical/laboratory use
- Lasers
- Jet water sprayers
- Boiler make-up water



Water Filtration & Treatment

Specialized MDM and Termoxide sorbents based on Russian technology may be cost effective for treatment of contaminated water at Fukushima using existing treatment system hardware

- Cs removal
- Sr removal

Specialized oil removal sorbents based upon Canadian peat-bogg material for pretreatment of water contaminated with:

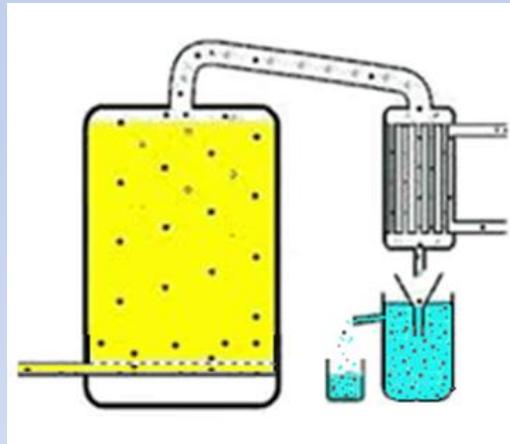
- Hydrocarbons
- Heavy metals



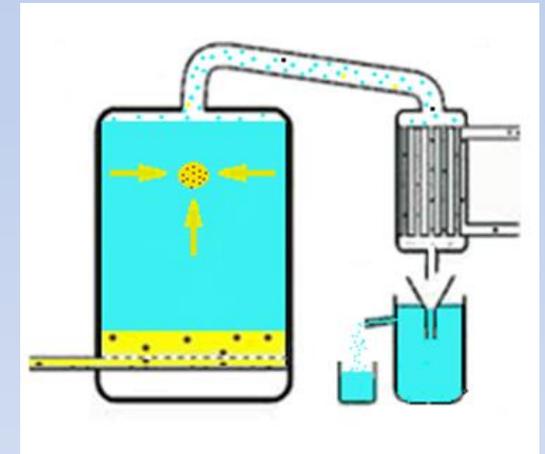
WOW SOLUTION – Italian Technology



- **Selective** evaporative system, for any type of contaminated solutions
- Full control of drag/entrainment effect



Standard
process



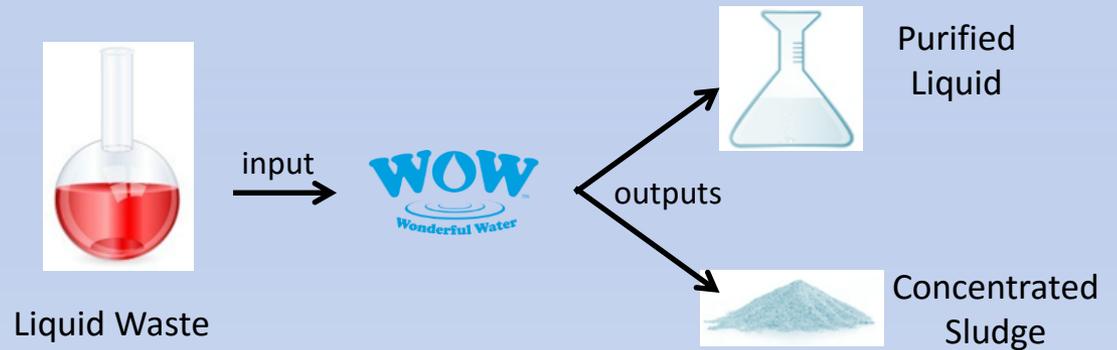
WOW
process

vs

WOW SOLUTION - Introduction



- 3 Streams:



- No evaporative additional tools are needed (e.g. no demister, no membrane, etc.)

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