# NORTH RIDGE ESTATES
## SUPERFUND SITE

KLAMATH FALLS, OR

REMEDIAL ACTION


Presented by:

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# Agenda

- Site Background
- Green Elements of Cleanup
  - Options considered in design
  - Final inclusion in specification
- Implementation
  - Met materials requirements
  - Challenges with meeting diesel targets
- Lessons Learned

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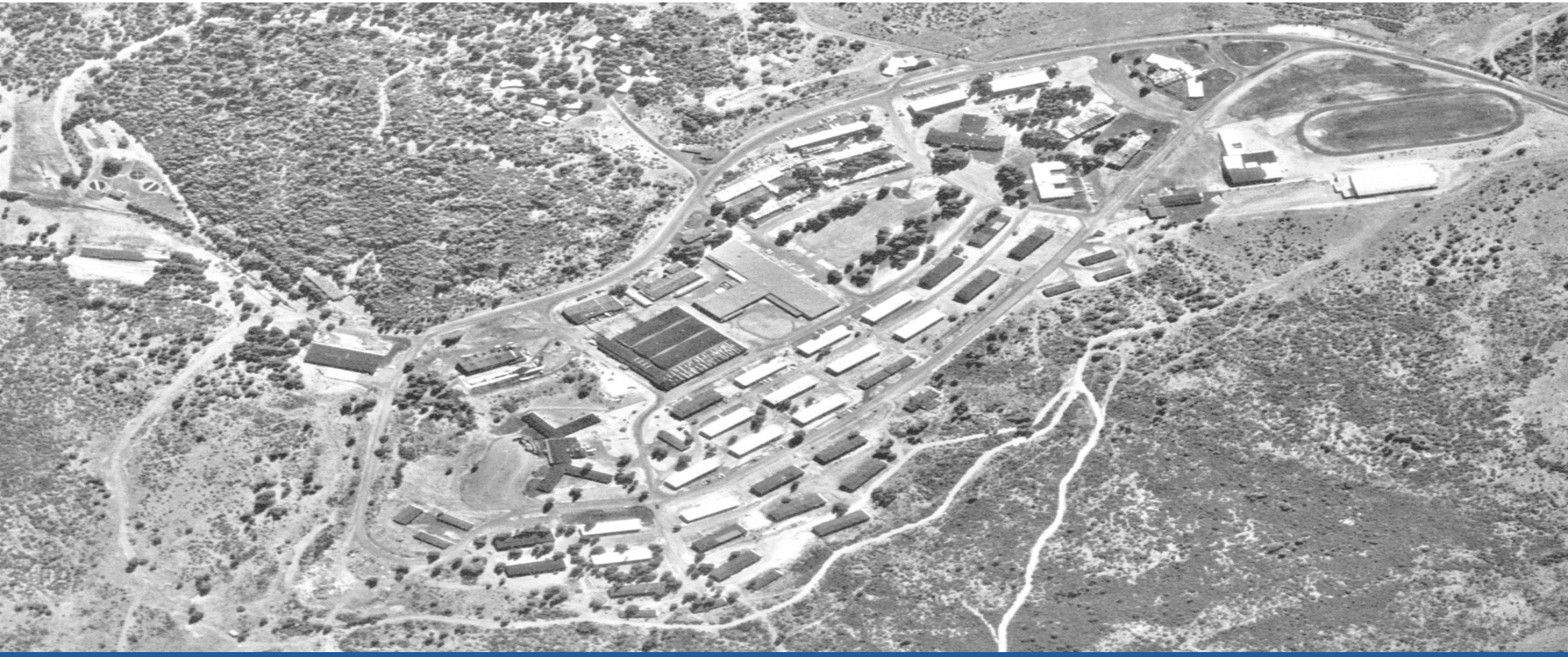
# Site Background



1944-1946: Marine Recuperative Barracks

82 buildings, accommodating about 5,000 veterans

# Cause of Asbestos Contamination

- Improper building demolition during residential development
- Asbestos containing materials (ACM) debris
  - Burial pits/waste piles
  - Surface/sub-surface disp
  - Steam pipe insulation
  - Friable and non-friable

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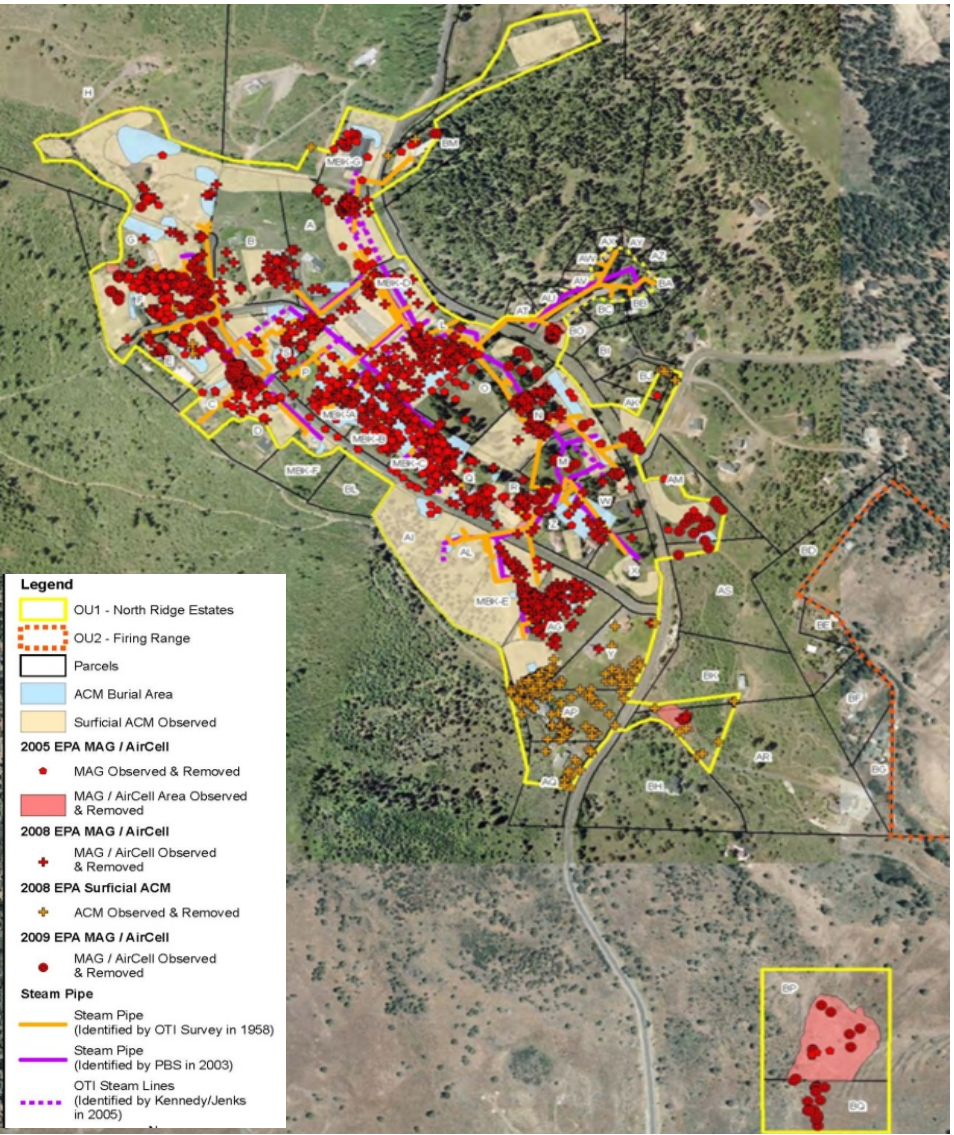


- Investigations estimated over 320,000 cubic yards contaminated soil; final number to be closer to 350,000 cubic yards
- Contamination can cover football field 150 ft. high
- Most places the debris is 2– 4 feet deep, but can be up to 12 feet deep

# Green Options Considered

- Include reference to Regional “Clean and Green” policy in bid documents
- **EPA applies ASTM guide and identifies Best Management Practices (BMPs) in bid documents**
- EPA asks bidders to identify BMPs
- EPA asks bidders to apply ASTM guide BMPs after winning bid, before construction

# BMP Selection Process

- Started with complete list of BMPs in ASTM Standard (160+ BMPs)
- 30 BMPs applicable to dig & haul operations
  - Equipment and fuel
  - Materials use
- 16 final BMPs considered for possible incorporation into remedial design
- 4 highest priority BMPs
  - Minimize diesel emission
  - Implement idle reduction
  - Use biodiesel
  - Use on-site or nearby source for clean fill

# Greatest Impacts

- Material and Reuse
  - Local backfill
  - Revegetate with native plants
  - Recovered materials
  - Reuse of existing buildings
- Diesel Goals
  - Off-road equipment
  - On-road vehicles

# BMP: Recycle/Reuse Materials

- Chipped trees reused at local bio-mass energy plant
- Large trees reused for lumber
- Scrap metal recycled
- Crushed concrete reused

- Reused existing buildings for offices and staff housing
- Reused existing storm piping when possible

# BMPs: Site Restoration

- Local sources of backfill (ODOT borrow pit)
- Revegetate quickly (end of each season)
- Native, drought resistant plant cover specified.
- Biodegradable, recycled s waddles

*Other: local staffing and subcontracting*

# BMPs: Diesel Off-Road Equipment

- All engines must meet at least EPA Tier 2 non-road emission standards


- Specifications Requirements
  - Meet Tier 4 (2008 or newer)

    OR

  - Retro-fit for 85% reduction in particulate matter (PM) emissions
- Season 1: ≥ 25% of equipment
- Seasons 2 and 3: ≥ 50% of equipment

# BMP: Diesel On-road Vehicles

- At least 90% of diesel on-road vehicles :
  - Engines that meet EPA 2007 on-road emissions standards

    OR

  - Emission control technology to reduce PM emissions by at least 85%
- Idling reduction plan for all diesel vehicles

| NORTHWIND INCORPORATED | Table 1: Diesel Construction Equipment & Vehicles<br>On-Site Equipment Inventory & Validation Sheet | Construction Year & Season<br>June 2017 - OU1 |
|---|---|---|

Indicates equipment is not in use or no longer on site.

## NWI Non-Road Diesel Construction Equipment

| Equipment Identification | | | | | | | Equipment Status | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | EPA Tier Standards | | | Retrofit Control Technology | | |
| ID | Description | Manufacturer | Model Number | Manuf Year | Diesel Engine Size (hp)* | Arrival On Site | Tier Rating | Meets Tier 2 Standards (Y/N) | Meets Tier 4 Standards (Y/N) | EPA/CARB Verified Device | Meets 85% PM Reduction (Y/N) | E&R Contractor Validator's Name |
| PK2199 | Dump Truck - Off Road | Komatsu | HM300 | 2012 | 333 | 22-Mar | 4 | Y | Y | N/A | N/A | T. Schurian |
| PK2045 | Dump Truck - Off Road | Komatsu | HM300 | 2012 | 333 | 1-May | 4 | Y | Y | N/A | N/A | T. Schurian |
| PK2047 | Dump Truck - Off Road | Komatsu | HM300 | 2012 | 333 | 1-May | 4 | Y | Y | N/A | N/A | T. Schurian |
| PK2304 | Dump Truck - Off Road | Komatsu | HM300 | 2012 | 333 | 20-Mar | 4 | Y | Y | N/A | N/A | T. Schurian |
| PK2306 | Dump Truck - Off Road | Komatsu | HM300 | 2012 | 333 | 17-Mar | 4 | Y | Y | N/A | N/A | T. Schurian |
| PK2605 | Dump Truck - Off Road | Komatsu | HM300 | 2012 | 333 | 24-Mar | 4 | Y | Y | N/A | N/A | T. Schurian |
| PK2606 | Dump Truck - Off Road | Komatsu | HM300 | 2014 | 333 | 16-Mar | 4 | Y | Y | N/A | N/A | T. Schurian |
| PK2666 | Dump Truck - Off Road | Komatsu | HM300 | 2014 | 333 | 10-Mar | 4 | Y | Y | N/A | N/A | T. Schurian |
| NM71685/XK7P44 | Trackhoe | Caterpillar | 326F | 2015 | 174.2 | 11-Mar | 4 | Y | Y | N/A | N/A | T. Schurian |
| NM71670/GK9A37 | Trackhoe | Caterpillar | 326F L | 2014 | 203 | 4-May | 4 | Y | Y | N/A | N/A | T. Schurian |
| NM72491 / JN7J86 | Trackhoe | Caterpillar | 326F L | 2015 | 203 | 12-Mar | 4 | Y | Y | N/A | N/A | T. Schurian |
| NM71459 / GU4L48 | Trackhoe (mini) | Caterpillar | 314E | 2015 | 89 | 13-Mar | 4 | Y | Y | N/A | N/A | T. Schurian |
| NM56054 | Trackhoe (mini) | Caterpillar | 312 | 2014 | 94 | 21-Jun | 4 | Y | Y | N/A | N/A | T. Schurian |
| NM72922 / BJ5N89 | Dozer | Caterpillar | D8T | *2014* | 347 | 7-Jun | 4 | Y | Y | N/A | N/A | T. Schurian |
| NM55722 | Dozer | Caterpillar | D7E | 2012 | 241 | 14-Mar | 4 | Y | Y | N/A | N/A | T. Schurian |
| NM73009 / TG5C48 | Dozer | Caterpillar | D6 LGP | 2014 | 150 | 1-May | 4 | Y | Y | N/A | N/A | T. Schurian |
| NM74202 / KH4R45 | Dozer | Caterpillar | D5K2 XL | 2016 | 104 | 8-May | 4 | Y | Y | N/A | N/A | T. Schurian |
| NM74205 / LH7N43 | Dozer | Caterpillar | D5K2 XL | 2016 | 104 | 24-May | 4 | Y | Y | N/A | N/A | T. Schurian |
| NM72923 | Roller Compactor | Caterpillar | CS54B | 2016 | 131 | 16-Mar | 4 | Y | Y | N/A | N/A | T. Schurian |
| NM72441 / PR9M46 | Roller Compactor | Caterpillar | CS44 | 2015 | 100 | 10-May | 5 | Y | Y | N/A | N/A | T. Schurian |
| NM71463 / EA6S46 | Loader | Caterpillar | 950M | 2015 | 230 | 15-Mar | 4 | Y | Y | N/A | N/A | T. Schurian |
| NM70260 | Forklift | Caterpillar | TL943C | 2014 | 94.5 | 8-Mar | 4 | Y | Y | N/A | N/A | T. Schurian |
| NM72232 / NA4F73 | Skidsteer | Caterpillar | 279D | 2015 | 82 | 9-Jan | 4 | Y | Y | N/A | N/A | T. Schurian |
| | | | | | | | | | | | | |

*1 kW = 1.34 hp

| NORTHWIND INCORPORATED | Table 1: Diesel Construction Equipment & Vehicles<br>On-Site Equipment Inventory & Validation Sheet | Construction Year & Season<br>June 2017 - OU1 |
|---|---|---|

Indicates equipment is not in use or no longer on site.

**Vic Russell Construction Non-Road Diesel Construction Equipment**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A35301 | Excavator | Komatsu | 360 | 2016 | 140 | 14-Jul | 4 | Y | Y | N/A | N/A | T. Schurian |
| 500220 | Excavator | Komatsu | 210-11 | 2016 | 107 | 14-Jul | 4 | Y | Y | N/A | N/A | T. Schurian |
| 76645 | Screen Plant | Metso | ST3.5 | 2012 | 75.04 | 14-Jul | 3 | Y | N | N | N | T. Schurian |
| 461252 | Conveyor | Metso | Ct3.2 | 2013 | 99.83 | 14-Jul | 4 | Y | Y | N/A | N/A | T. Schurian |
| PK2577 | Dozer (C15) | Caterpillar | D8T | 2011 | 238 | 14-Jul | 4 | Y | Y | N/A | N/A | T. Schurian |
| | | | | | | | | | | | | |

| | | |
|---|---|---|
| Total on site vehicles this period: | 26 | (present more than 50% of the month) |
| Tier 4 Compliant: | 25 | |
| Percent Tier 4 Compliant: | 96% | |
| Required Percent Compliant This Period | 25% | |

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|---|---|---|

Indicates equipment is not in use or no longer on site.

## NWI On-Road Diesel Construction Vehicles

| Vehicle Identification | | | | | | | Vehicle Status | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | EPA Standards | | | Retrofit Control Technolgy | | |
| ID | Description | Manufacturer | Make/ Model | Model Year | Gross Weight (lb) | Arrival On Site | Model Year 2007 or Newer (Y/N) | --- | Meets 2007 Standards (Y/N) | EPA/CARB Verified Device | Meets 85% PM Reduction (Y/N) | E&R Contractor Validator's Name |
| PK462 | Dump Truck | Peterbilt | 367 | 2009 | 102 | 1-Jan | Y | --- | Y | N/A | N/A | T. Schurian |
| PK464 | Dump Truck | Peterbilt | 367 | 2009 | 102 | 1-Jan | Y | --- | Y | N/A | N/A | T. Schurian |
| PK460 | Dump Truck | Peterbilt | 367 | 2009 | 102 | 1-Jan | Y | --- | Y | N/A | N/A | T. Schurian |
| PK459 | Dump Truck | Peterbilt | 367 | 2009 | 102 | 1-Jan | Y | --- | Y | N/A | N/A | T. Schurian |
| PK2443 | Water Truck | Peterbilt | 365 | 2015 | 66 | 1-Jan | Y | --- | Y | N/A | N/A | T. Schurian |
| PK1422 | Water Truck | Peterbilt | 365 | 2012 | 66 | 1-Jan | Y | --- | Y | N/A | N/A | T. Schurian |
| PK461 | Dump Truck | Peterbilt | 367 | 2009 | 102 | 26-Jun | Y | --- | Y | N/A | N/A | T. Schurian |
| PK1572A | Dump Truck | Peterbilt | 367 | 2013 | 106 | 28-Jun | Y | --- | Y | N/A | N/A | T. Schurian |
| USDOT 1749523 | Dump Truck | Kenworth | T800 | 2014 | 56 | 1-Jun | Y | --- | Y | N/A | N/A | T. Schurian |

## Vic Russell Construction On-Road Diesel Construction Vehicles

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Haul Truck (#02) | Haul Truck | Kenworth | KW37D | 1992 | 56 | 8-May | N | --- | N | Pending | Pending | T. Schurian |
| Haul Truck (#16) | Haul Truck | Kenworth | KWT800 | 2003 | 56 | 8-May | N | --- | N | Pending | Pending | T. Schurian |
| Haul Truck (#33) | Haul Truck | Western Star | 4964 | 1990 | 56 | 8-May | N | --- | N | Pending | Pending | T. Schurian |
| Haul Truck (#44) | Haul Truck | Kenworth | T800 | 2002 | 56 | 8-May | N | --- | N | Pending | Pending | T. Schurian |
| Haul Truck (#50) | Haul Truck | Kenworth | T800 | 2006 | 56 | 8-May | N | --- | N | Pending | Pending | T. Schurian |
| Haul Truck (#55) | Haul Truck | Kenworth | T800 | 1999 | 56 | 8-May | N | --- | N | Pending | Pending | T. Schurian |
| Haul Truck (#66) | Haul Truck | Kenworth | KWT800 | 1991 | 56 | 8-May | N | --- | N | Pending | Pending | T. Schurian |
| Haul Truck (#88) | Haul Truck | Western Star | 4694F | 1995 | 56 | 8-May | N | --- | N | Pending | Pending | T. Schurian |

| | | |
|---|---|---|
| Total number of on-road vehicles this period: | 11 | (present more than 50% of the month) |
| Total number of on-road vehicles meeting 2007 Standards: | 3 | |
| Percent meeting 2007 Standards: | 27% | (By number of vehicles) |
| Required percent compliant this period: | 90% | |

# On-Road Vehicle Challenges

- Local owner-operators with older trucks
  - Could not afford retrofits (and no long-term incentive)
  - EPA focus also on use of local labor
- New trucks meeting emissions standards we problematic
  - Short hauls, not at highway speed
  - Decreased efficiency of work due to “regen”

# Specification Language - Flexibility

- Materials: "Unless approved otherwise by the RA Construction Manager…"

- Diesel Goals: "If the E&R Contractor can prove to the RA Construction Manager's satisfaction that for a particular class of onroad diesel vehicle, nonroad construction equipment, or generator, **(1) no alternative equipment with a Tier 4 engine is available, (2) it is not technically feasible to meet the control level specified above with a verified device,** or (3) installing the control device would create a safety hazard, then the subcontractor, with written approval, **may exclude the equipment from the emissions standards."**

# BMP Evaluation: Conclusions

- Do analysis early in the design phase
- Focus on shrinking the remedy's overall footprint
- Review entire BMP list
- Identify most applicable and most effective
- Consider locational and work activity challenges

# BMP Evaluation: Conclusions

- Provide incentives in contract language
- Incorporate into the project specifications but leave some flexibility

# Questions