

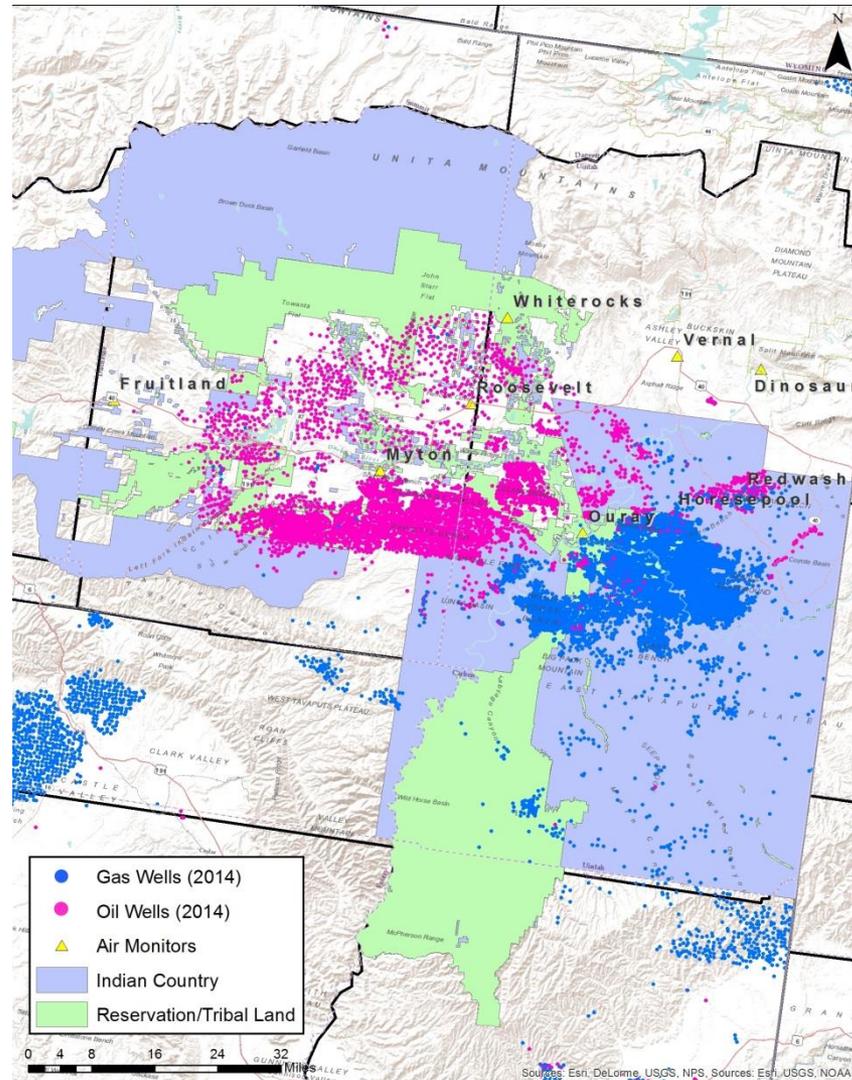
Air Quality Compliance and Use of IR Cameras

Science for Solution II Workshop

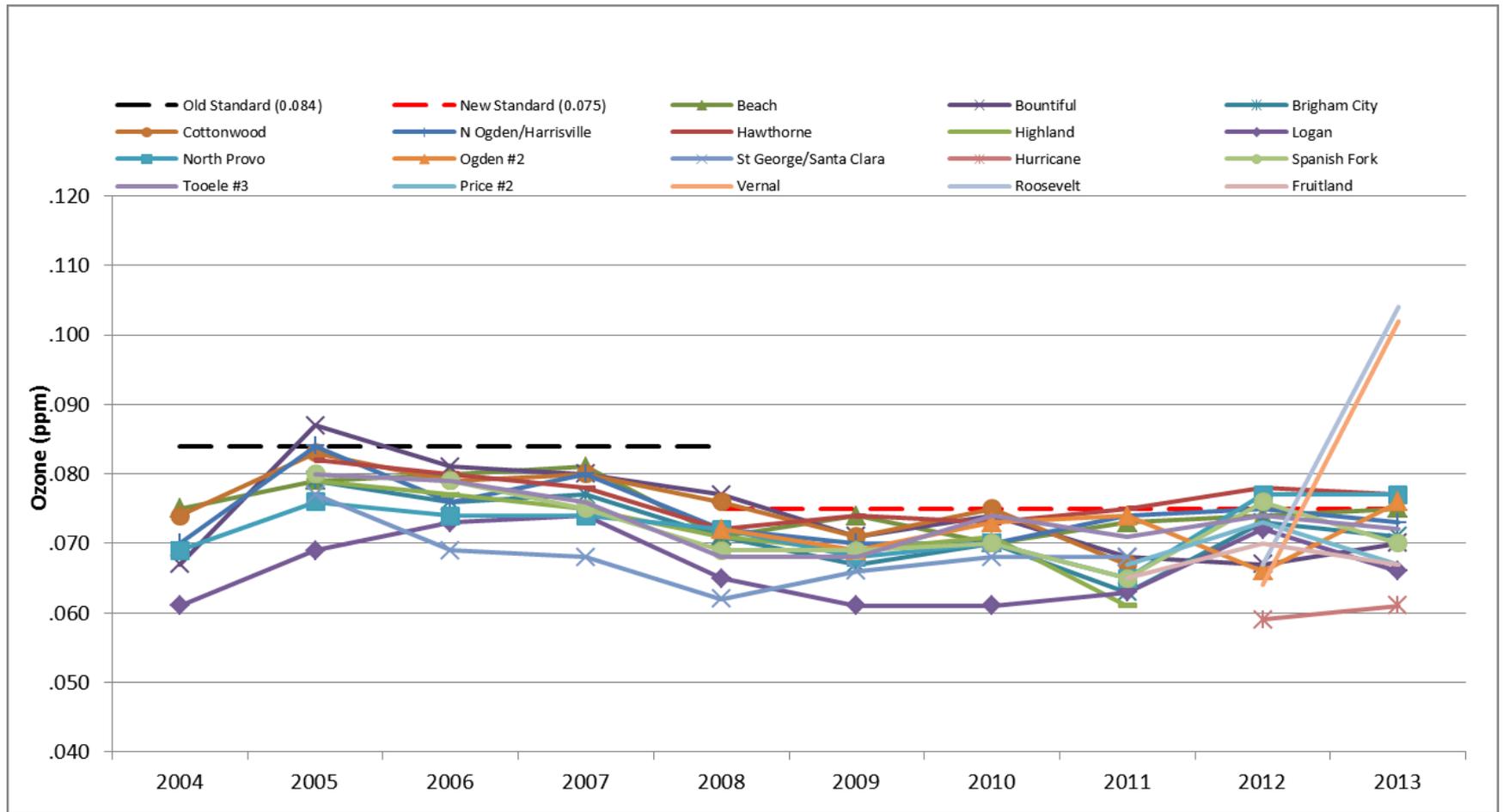
7/28/2015

Whitney Oswald

Basin Ozone Monitoring



Ozone 4th Highest 8-Hour Concentration

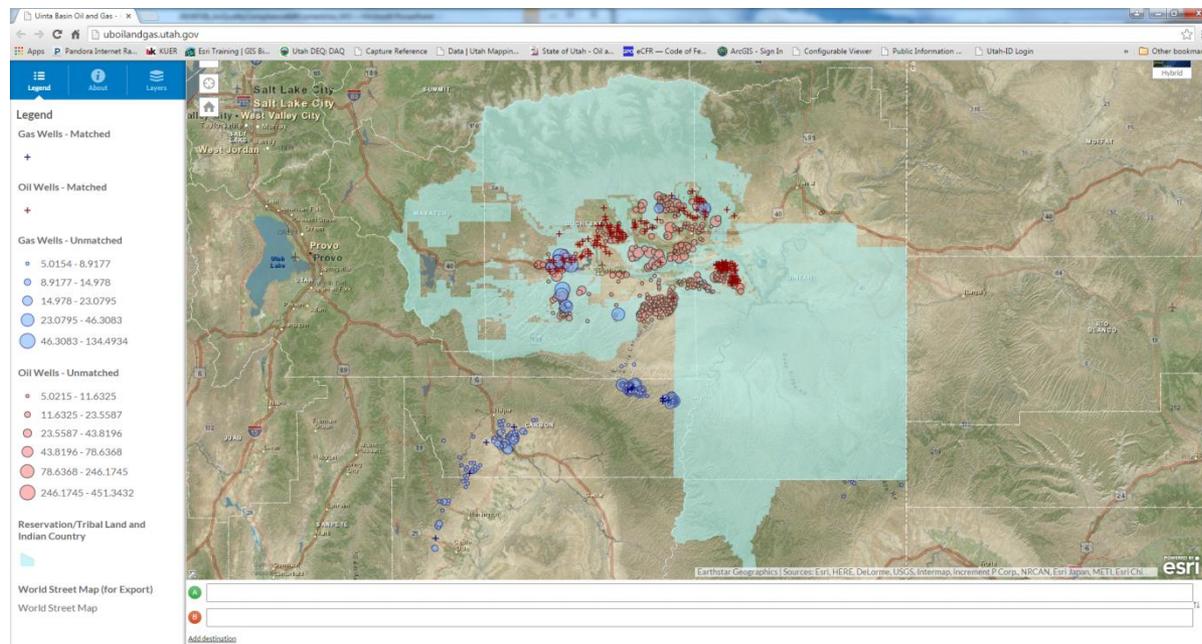


DAQ: Compliance

- Major and Minor Source Compliance sections are responsible for ensuring that all regulatory requirements are met.
- This is done through inspections, audits, and enforcement.

Directing Focus

- Linked to DOGM Data
- Using DOGM Production to evaluate R307-401 applicability
- ArcGIS Tablet/Desktop Application
 - Easy to pinpoint sites of interest.
 - Real-time data out in the field.



Typical Level I Inspection

- Surveillance
- Often complaint based

Level II Inspection

- Often arranged a few days in advance to insure access.
- Sites are inspected against Approval Orders, Permits, applicable regs.
 - Unapproved equipment or modifications
 - Verify Specs – hp, btu, tank size, control efficiency, ect...
 - Stack testing
 - Poor maintenance practices
 - Combustor/Flare
 - Fugitive leaks

Level II Inspection

- Fugitive Leak Detection – IR Camera
- Show leaks to source contact
 - Answer any questions
 - Compliance Assistance
- Record all leaks in one continuous clip
 - Document site name and location in the clip

Compliance Actions

- Warning
 - Reserved for very minor issues
- Compliance Advisory Notice – CAN
 - Less severe than NOV
 - Usually results in fines
 - Fines more severe if pattern shown
- Notice of Violation – NOV

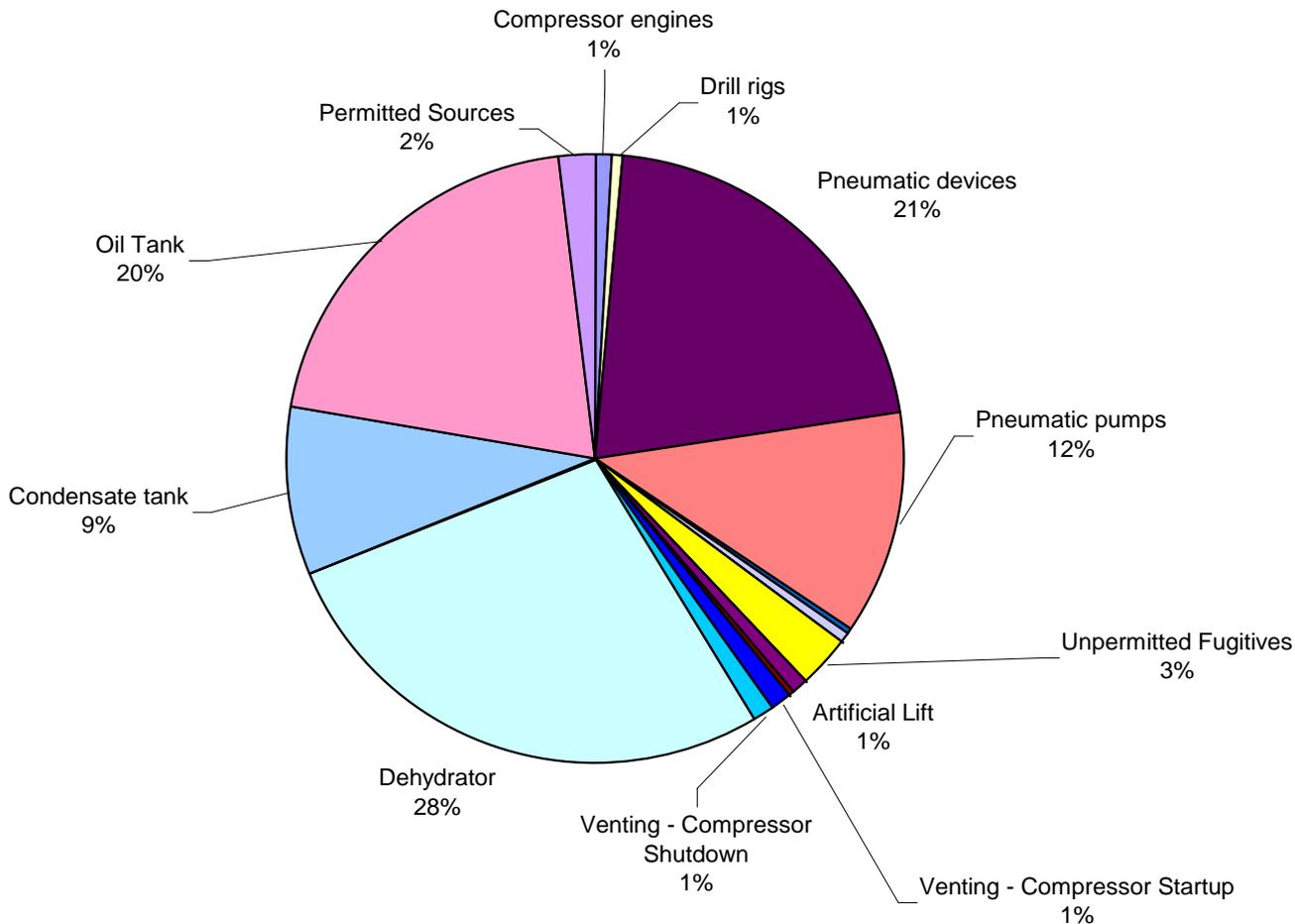
Leak Detection & Repair Programs

- Proven, cost-effective strategy
- Reduces environmental impacts
- EPA's Gas STAR partners estimate 45,000 to 128,000 Mcf/yr per plant savings

<http://www.epa.gov/gasstar/>

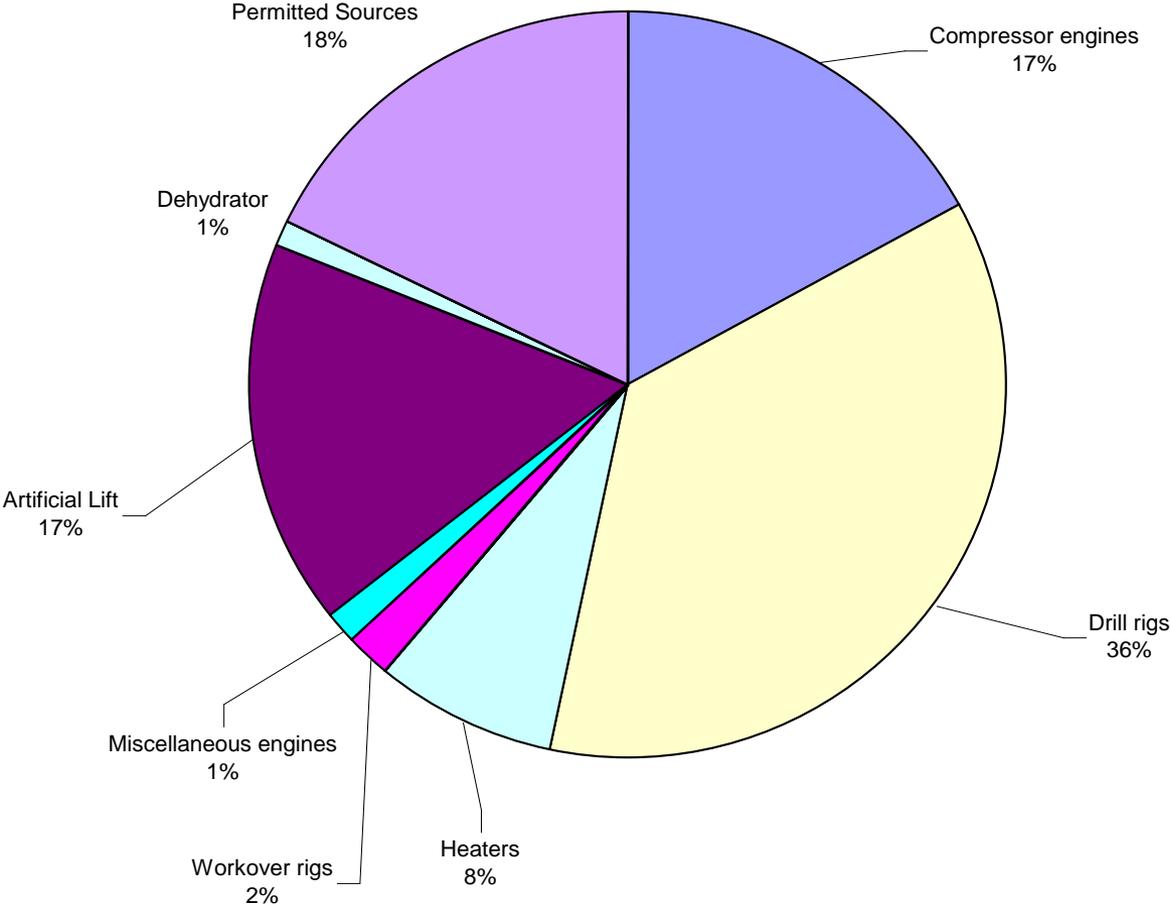


Directing Focus: VOC Emissions By Source Category



- E&P emissions currently 98%-99% of Basin inventory.
- Top E&P VOC source categories include dehydrators, pneumatics and oil/condensate tanks

Directing Focus: NO_x Emissions By Source Category



NO_x emissions dominated by drilling rigs, permitted and unpermitted compressors and artificial lift engines

Monitoring and Maintenance

- Implement directed inspection and maintenance program to identify fugitive emissions
- IR Cameras easily detect leaking compressors, valves, connectors, seals, hatches, tanks, etc...
- Largest source of leaks:
 - Valves (30%)
 - Connectors (24%)
 - Compressor seals (23%)



Compliance Focus in Basin

- Eye-C-Gas IR Cameras
 - Courtesy leak detection program has ended.
 - Now compliance tool.
 - Two full time inspectors assigned to basin.
- Added focus on leak detection, reducing VOCs.



Eye-C-Gas IR Camera

- Infrared (IR) radiation is one of the many types of 'light' in the electromagnetic spectrum
- IR radiation wavelengths are longer than visible light. Not visible to human eye
- EYE-C-Gas camera detects gases emitted by upstream and midstream oil and gas sources
- These gases are detected in the middle of the IR spectrum, 3 – 5 μm



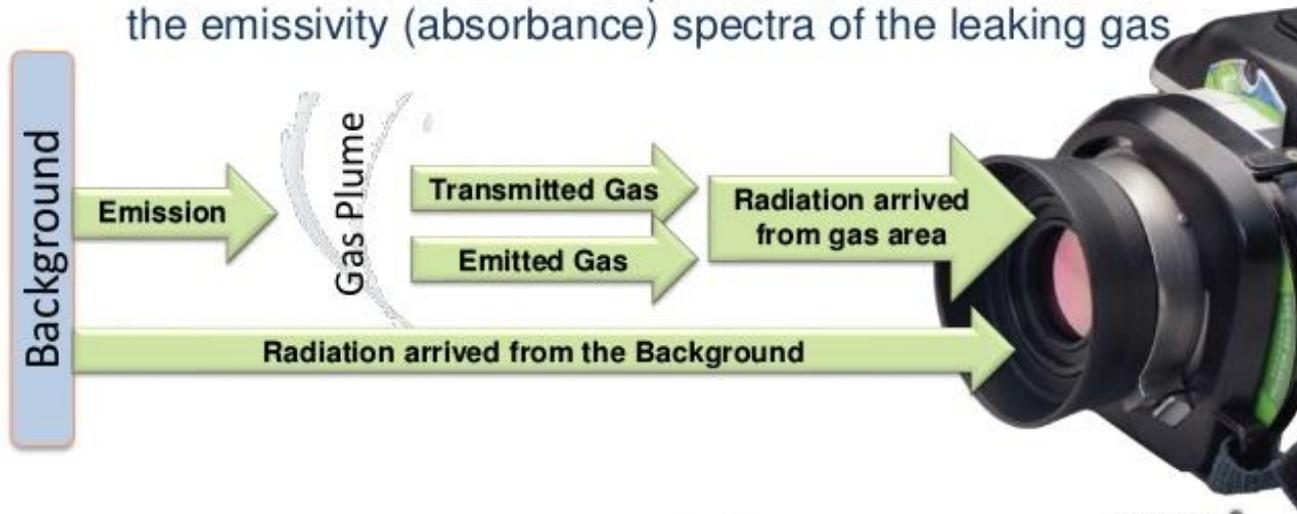
EYE-C-Gas Camera



How it works



- The leaking gas temperature differs from the background temperature
- The EYE-C-GAS camera spectral band coincides with the emissivity (absorbance) spectra of the leaking gas



IR Camera Video



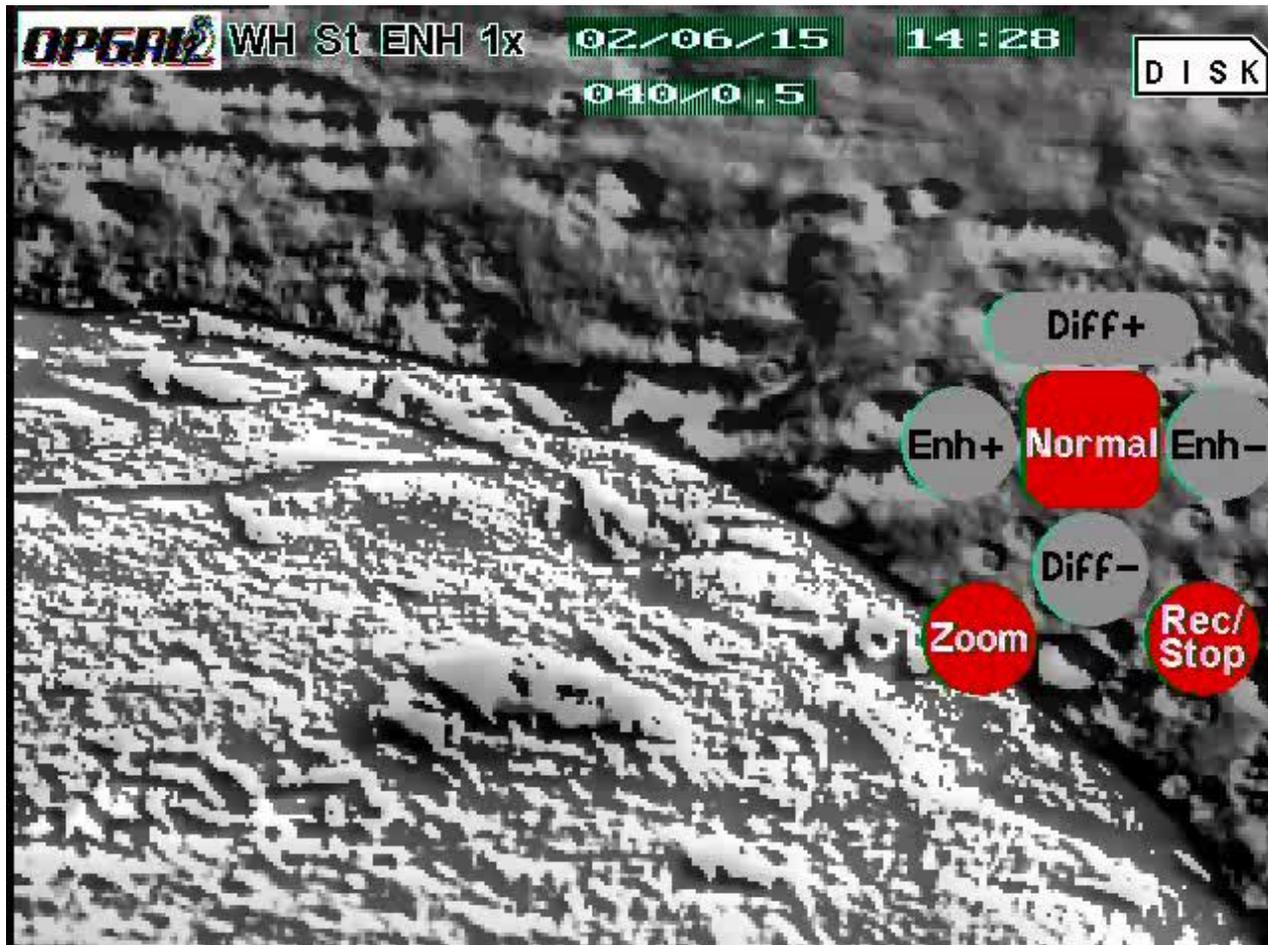
Normal v. Enhanced



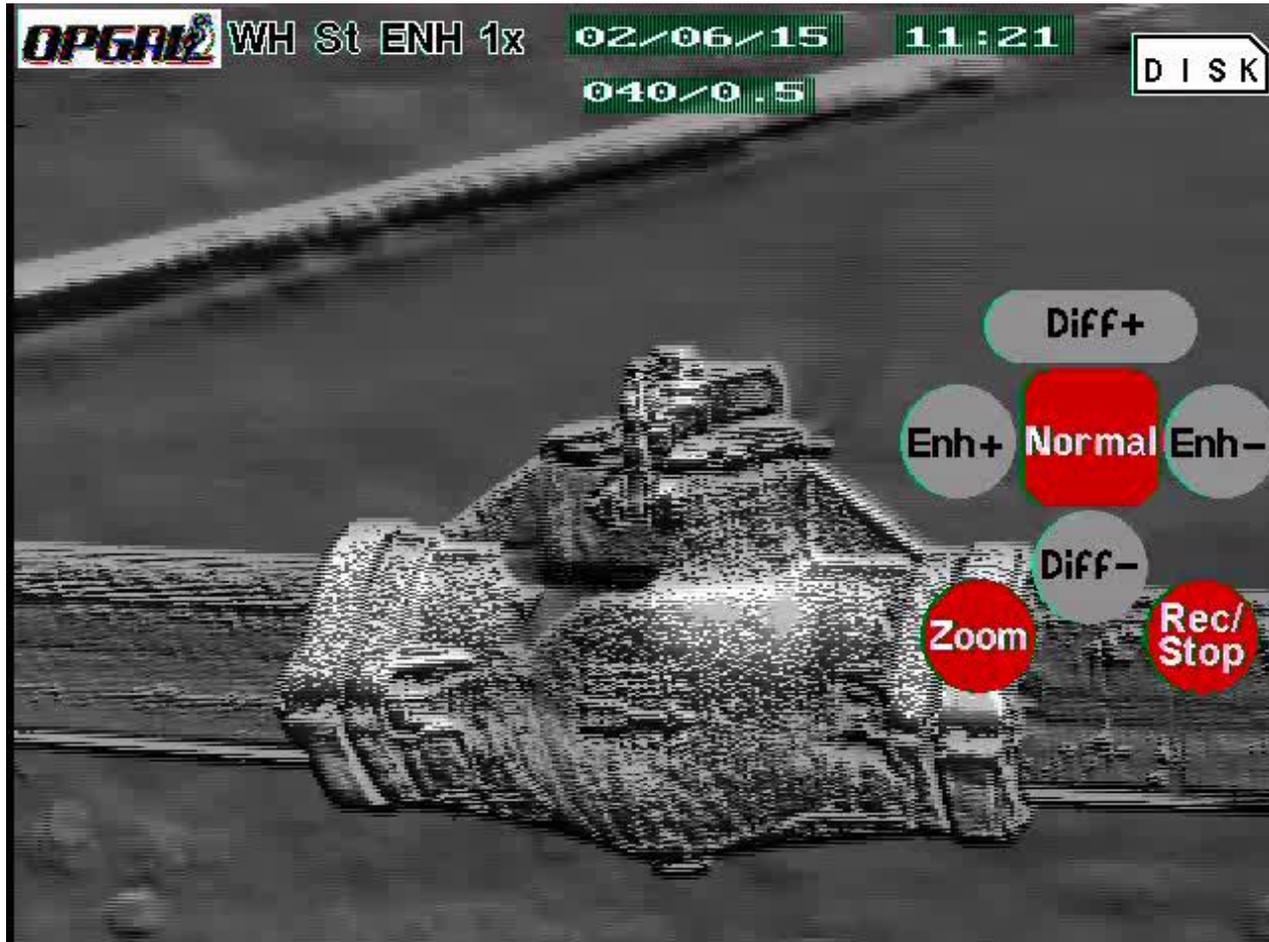
Tanks: Thief Hatches



Tanks



Valve



Open Pit Tank



Questions?

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