



DTE Energy Rod Packing Evaluation and Replacement Program

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AGENDA

- DTE Energy's GHG Program & Timeline
- 2011-2015 Initial Testing & Data Collection (where we were)
- 2015 Average Rod Packing Leak Rate vs. Age of Rod Packing
- Rod Packing Prioritization – (what went into it)
- 2011-2019 Data (Where we are now)
- 2018 Average Rod Packing Leak Rate vs. Age of Rod Packing
- Lessons learned
- New opportunities and where our focus is going forward

DTE Energy GHG Program & Timeline

Todd Baker - Environmental Field Supervisor

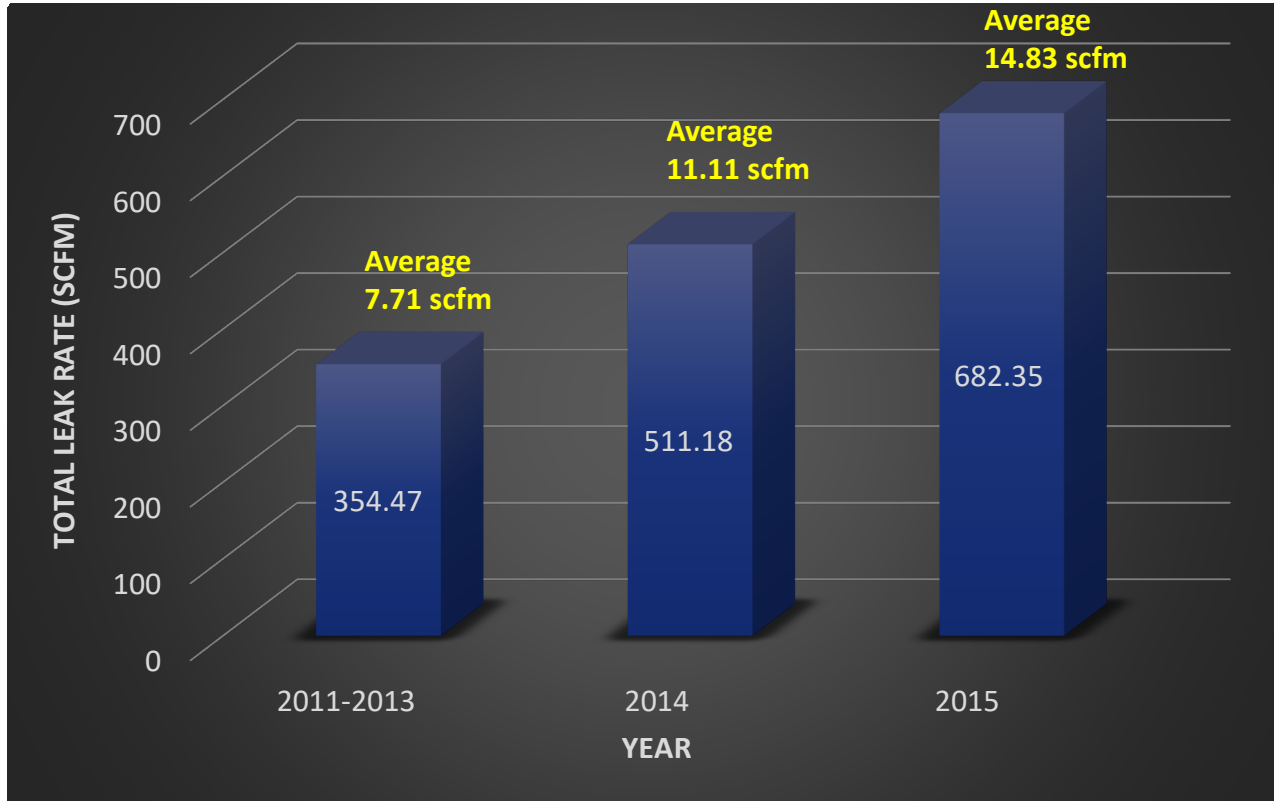
- ✓ Certified Thermographer
- ✓ Certified Optical Gas Imaging
- ✓ OQ Qualification

Steven Anderson - Environmental Specialist

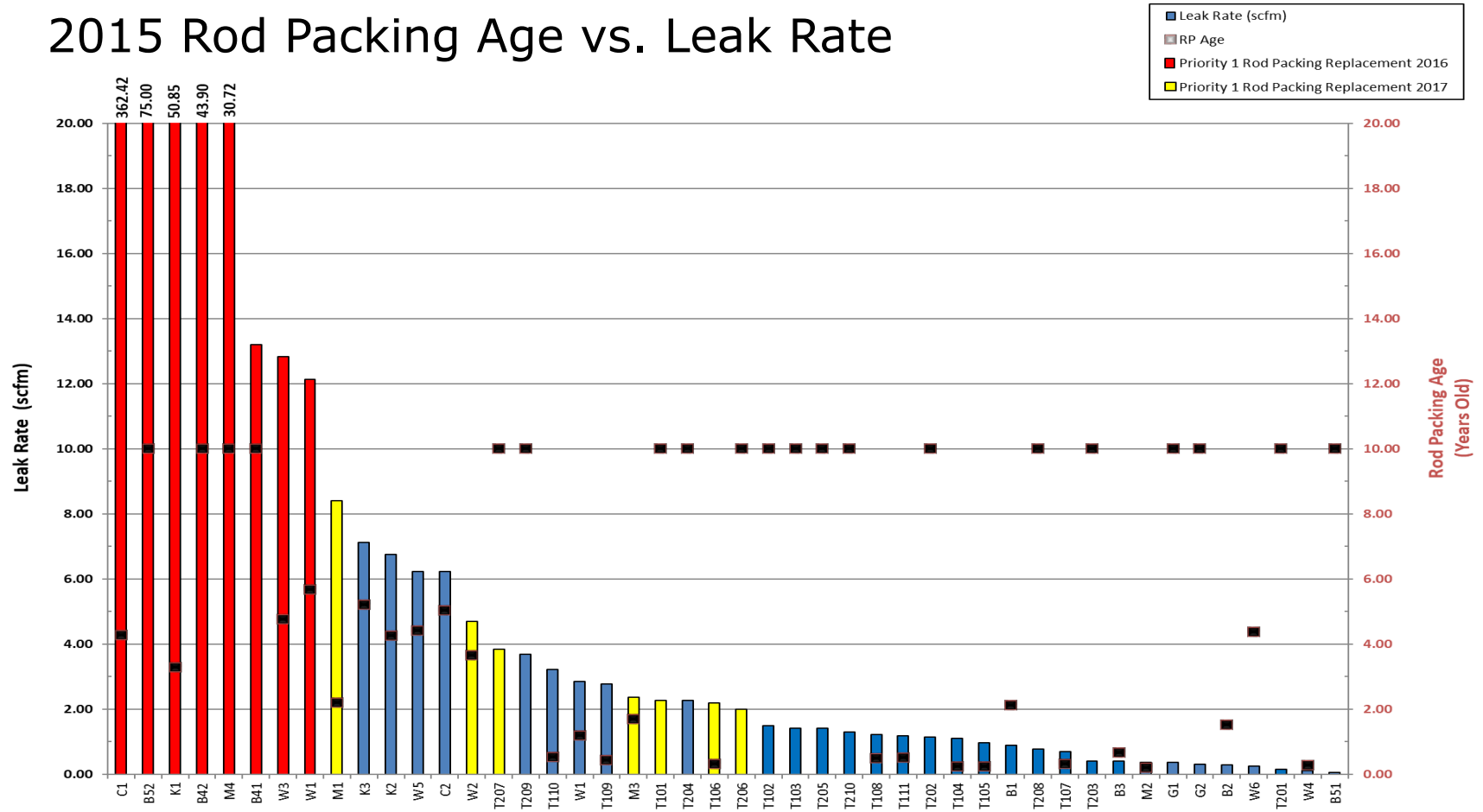
- ✓ Certified Thermographer
- ✓ Certified Optical Gas Imaging
- ✓ OQ Qualification

2011	2012	2013	2014	2015	2016	2017-2019
GHG start-up	Subpart W	Subpart W	Subpart W	Subpart W	Subpart W	Subpart W
Subpart W	LDAR	LDAR	LDAR	LDAR	LDAR	LDAR
LDAR	CNG Stations	Well Surveys	GP-5	GP-5	GP-5	GP-5
EPA Gas Star	EPA Gas Star	EPA Gas Star	EPA Gas Star	LFG Surveys	LFG Surveys	LFG Surveys
				EPA Gas Star	Methane Challenge	OOOa
						PHMSA
						Methane Challenge

Total Rod Packing Leak Rate vs. Average Unit Leak Rate 2011-2015



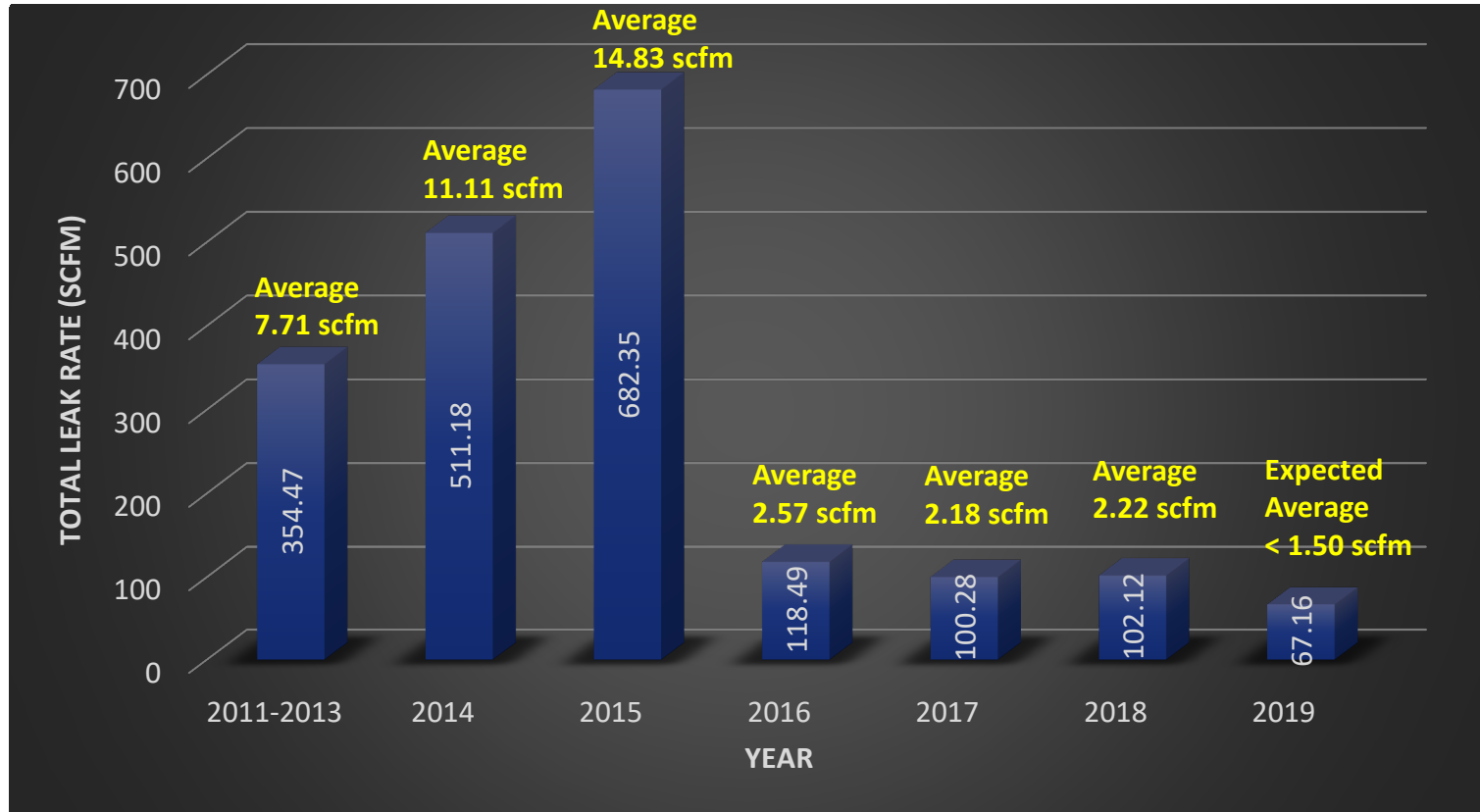
2015 Rod Packing Age vs. Leak Rate



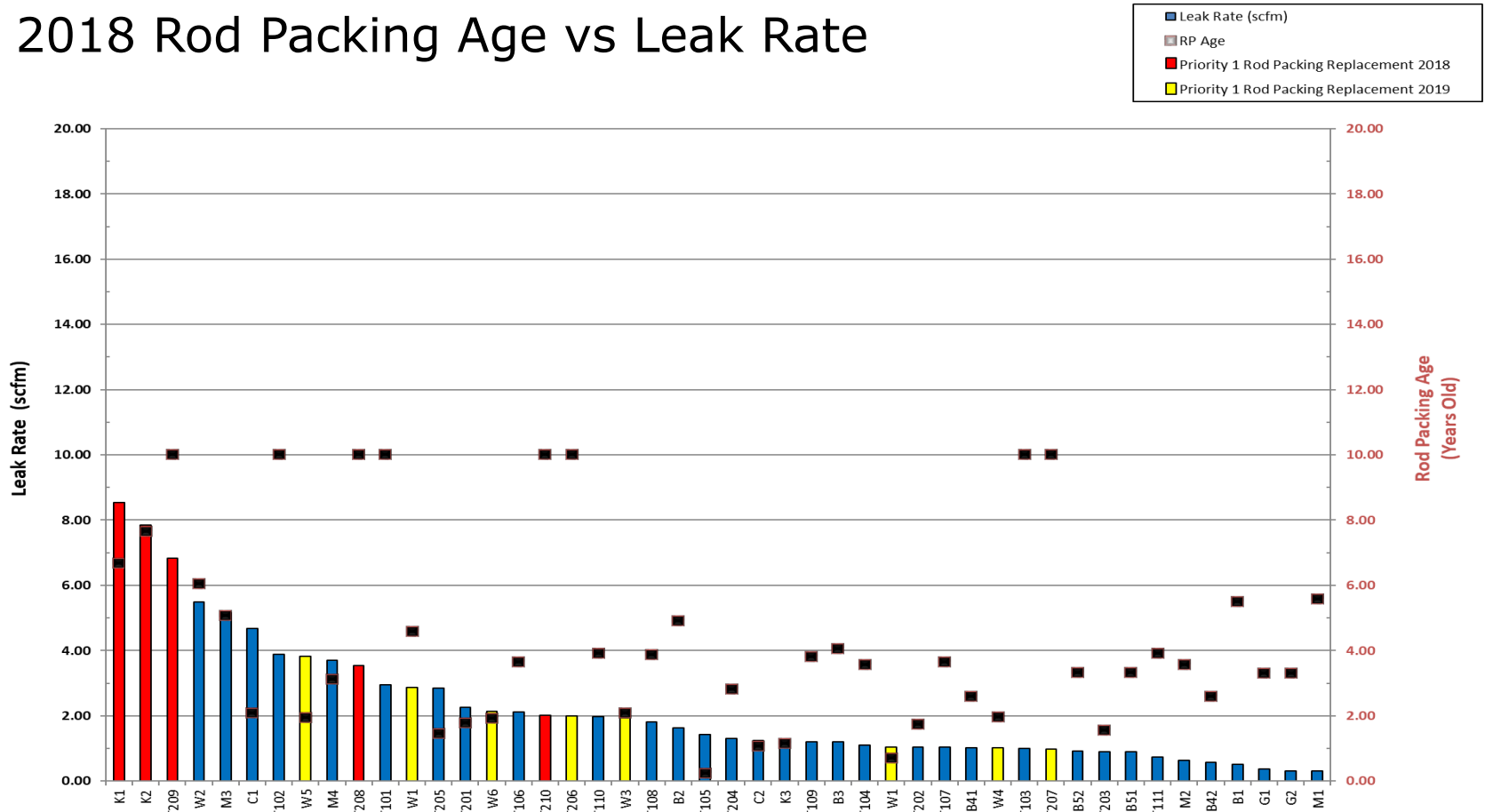
Rod Packing Replacement Prioritization

- **Leak Rate** – GHG leak survey team checks rod packing leak rates annually on all units to determine which are our highest emitters
- **Age/Hours** – If a packing is approaching 26,000 hours this will take first priority regardless of any other factors
- **Scheduled Outage** – More cost effective if unit is going through an outage to go ahead and change rod packing while unit is under repair
- **Safety** – Large leakers can cause safety concerns in yard area
- **Availability of unit** – Will the unit meet it's projected availability (metric) for the year if a rod packing change out occurs
- **Return On Investment (ROI)** – A leak rate that is a significant outlier compared to the remainder of the fleet
- **Hours Unit Operates** – We look at the units run hours vs leak rate to determine if packing is a priority

Total Rod Packing Leak Rate vs. Average Unit Leak Rate 2011-2019



2018 Rod Packing Age vs Leak Rate



* Average Leak Rate Across Fleet is 2.22 scfm
 * Average Rod Packing Age - 4.4 years

Lessons Learned

- ✓ Communication – Work with operators, gas control, reliability team and gas Management to make this an area of focus
- ✓ Flexibility – Field crew that is flexible and willing to change plans at the last minute to catch a rod packing measurement while unit is operating
- ✓ Equipment – Do your research, use good reliable equipment for identification and quantification of leaks
- ✓ Training – Staff trained properly on all equipment; hi flow sampler, OGI Cameras, man-lift operation, personal gas monitors and safety requirements
- ✓ Management Support – Environmental Management and Resources (EM&R) Leadership supported us throughout this endeavor
- ✓ Maintain – Continue to monitor packing hours, leak rates & outages to ensure we are as efficient as possible

New opportunities, focus and priorities going forward

- ✓ Repairing ALL leaks found during leak surveys – continue to challenge our stations with repairing all leaks found during subpart W leak surveys
- ✓ Mitigating venting and blowdowns – utilize temporary compression/drawdown
- ✓ Track avoided emissions (leaks, blowdowns, venting, drawdowns etc.)
- ✓ Reach DTE carbon reduction goal of 80% by 2040





Questions?