



National Fuel[®]

Leveraging GIS for Responsibly Sourced Gas (RSG) Certification

Gary Bowles

GIS Database Administrator

Seneca Resources Company, LLC

Safe Harbor For Forward Looking Statements



National Fuel®

This presentation may contain “forward-looking statements” as defined by the Private Securities Litigation Reform Act of 1995, including statements regarding future prospects, plans, objectives, goals, projections, estimates of oil and gas quantities, strategies, future events or performance and underlying assumptions, capital structure, anticipated capital expenditures, completion of construction projects, projections for pension and other post-retirement benefit obligations, impacts of the adoption of new accounting rules, and possible outcomes of litigation or regulatory proceedings, as well as statements that are identified by the use of the words “anticipates,” “estimates,” “expects,” “forecasts,” “intends,” “plans,” “predicts,” “projects,” “believes,” “seeks,” “will,” “may,” and similar expressions. Forward-looking statements involve risks and uncertainties which could cause actual results or outcomes to differ materially from those expressed in the forward-looking statements. The Company’s expectations, beliefs and projections are expressed in good faith and are believed by the Company to have a reasonable basis, but there can be no assurance that management’s expectations, beliefs or projections will result or be achieved or accomplished.

In addition to other factors, the following are important factors that could cause actual results to differ materially from those discussed in the forward-looking statements: changes in laws, regulations or judicial interpretations to which the Company is subject, including those involving derivatives, taxes, safety, employment, climate change, other environmental matters, real property, and exploration and production activities such as hydraulic fracturing; governmental/regulatory actions, initiatives and proceedings, including those involving rate cases (which address, among other things, target rates of return, rate design, retained natural gas and system modernization), environmental/safety requirements, affiliate relationships, industry structure, and franchise renewal; the Company’s ability to estimate accurately the time and resources necessary to meet emissions targets; governmental/regulatory actions and/or market pressures to reduce or eliminate reliance on natural gas; the length and severity of the ongoing COVID-19 pandemic, including its impacts across our businesses on demand, operations, global supply chains and liquidity; changes in economic conditions, including global, national or regional recessions, and their effect on the demand for, and customers’ ability to pay for, the Company’s products and services; changes in the price of natural gas or oil; the creditworthiness or performance of the Company’s key suppliers, customers and counterparties; financial and economic conditions, including the availability of credit, and occurrences affecting the Company’s ability to obtain financing on acceptable terms for working capital, capital expenditures and other investments, including any downgrades in the Company’s credit ratings and changes in interest rates and other capital market conditions; impairments under the SEC’s full cost ceiling test for natural gas and oil reserves; delays or changes in costs or plans with respect to Company projects or related projects of other companies, including disruptions due to the COVID-19 pandemic, as well as difficulties or delays in obtaining necessary governmental approvals, permits or orders or in obtaining the cooperation of interconnecting facility operators; the Company’s ability to complete planned strategic transactions; the Company’s ability to successfully integrate acquired assets and achieve expected cost synergies; changes in price differentials between similar quantities of natural gas or oil sold at different geographic locations, and the effect of such changes on commodity production, revenues and demand for pipeline transportation capacity to or from such locations; the impact of information technology disruptions, cybersecurity or data security breaches; factors affecting the Company’s ability to successfully identify, drill for and produce economically viable natural gas and oil reserves, including among others geology, lease availability, title disputes, weather conditions, shortages, delays or unavailability of equipment and services required in drilling operations, insufficient gathering, processing and transportation capacity, the need to obtain governmental approvals and permits, and compliance with environmental laws and regulations; increasing health care costs and the resulting effect on health insurance premiums and on the obligation to provide other post-retirement benefits; other changes in price differentials between similar quantities of natural gas or oil having different quality, heating value, hydrocarbon mix or delivery date; the cost and effects of legal and administrative claims against the Company or activist shareholder campaigns to effect changes at the Company; uncertainty of oil and gas reserve estimates; significant differences between the Company’s projected and actual production levels for natural gas or oil; changes in demographic patterns and weather conditions; changes in the availability, price or accounting treatment of derivative financial instruments; changes in laws, actuarial assumptions, the interest rate environment and the return on plan/trust assets related to the Company’s pension and other post-retirement benefits, which can affect future funding obligations and costs and plan liabilities; economic disruptions or uninsured losses resulting from major accidents, fires, severe weather, natural disasters, terrorist activities or acts of war; significant differences between the Company’s projected and actual capital expenditures and operating expenses; or increasing costs of insurance, changes in coverage and the ability to obtain insurance. Forward-looking statements include estimates of oil and gas quantities. Proved oil and gas reserves are those quantities of oil and gas which, by analysis of geoscience and engineering data, can be estimated with reasonable certainty to be economically producible under existing economic conditions, operating methods and government regulations. Other estimates of oil and gas quantities, including estimates of probable reserves, possible reserves, and resource potential, are by their nature more speculative than estimates of proved reserves. Accordingly, estimates other than proved reserves are subject to substantially greater risk of being actually realized. Investors are urged to consider closely the disclosure in our Form 10-K available at www.nationalfuel.com. You can also obtain this form on the SEC’s website at www.sec.gov.

For a discussion of the risks set forth above and other factors that could cause actual results to differ materially from results referred to in the forward-looking statements, see “Risk Factors” in the Company’s Form 10-K for the fiscal year ended September 30, 2020 and the Forms 10-Q for the quarter ended December 31, 2020, March 31, 2021 and June 30, 2021. The Company disclaims any obligation to update any forward-looking statements to reflect events or circumstances after the date thereof or to reflect the occurrence of unanticipated events.

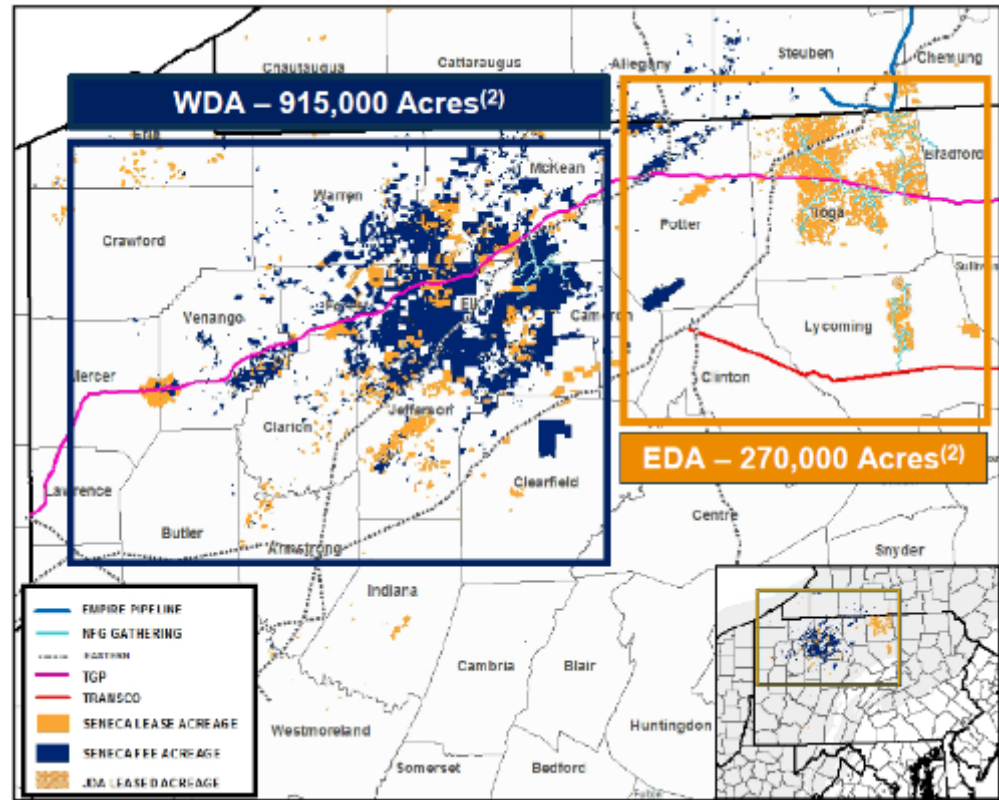
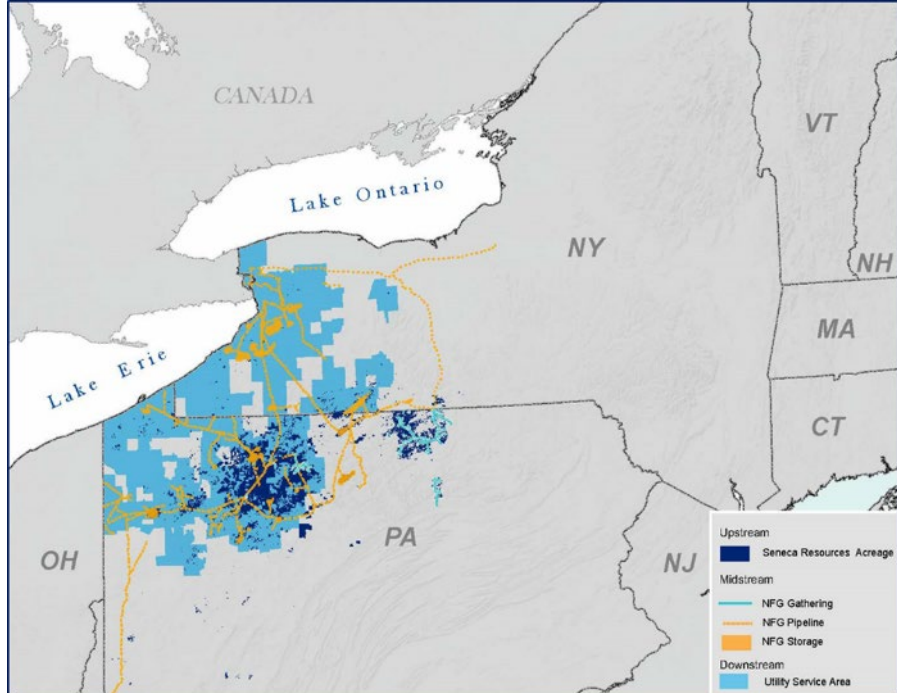


- We are **Seneca Resources Company, LLC**, the exploration and production segment of National Fuel Gas Company.
- We **explore for, develop and produce natural gas and oil** reserves in California and the Appalachian Region, including the Marcellus and Utica Shales.
- 300+ employees in **PA, CA & TX**
- **Environmental stewardship** guiding principle

100+ Years In Pennsylvania

- Develop both Marcellus & Utica shale
- Date back to the original boom in the Oil Heritage Region
- Operate ~900 deep, unconventional shale wells
- Control more than 1,000,000 net prospective acres

Operational Territory





SENECA RESOURCES GEOMATICS DEPARTMENT



Special Achievement in GIS
2014 Award Winner

Web Map

Land

Land Base Map

Service

CALIFORNIA REPUBLIC
California

California Basemap

Web Map

Pennsylvania

PA - Production by Pad

Web Map

Geology

Geology Base Map

Contact Us

Seneca Resources is committed to the safe and environmentally conscious development, transportation, storage, and distribution of natural gas and oil resources.

National Fuel's Guiding Principles



Safety

We value the safety of all of our customers, employees, and communities, and work diligently to establish a culture of safety that is embraced throughout the organization.



Innovation

We strive to exceed the standards for safe, clean, and reliable energy development. We invest in the future of our regions' energy resources. We envision a long and healthy future for our company.



Environmental Stewardship

Environmental protection and conservation of resources are high priorities for National Fuel. We utilize procedures, technologies, and best management practices to develop, build, and operate our assets in a manner that respects and protects the environment.



Satisfaction

We work to deliver reliable, high quality service for our customers. We want our shareholders to see a strong return on their investment. We want our employees to work in a positive, safe, and rewarding environment. We want our communities to be proud to call us neighbors.



Community

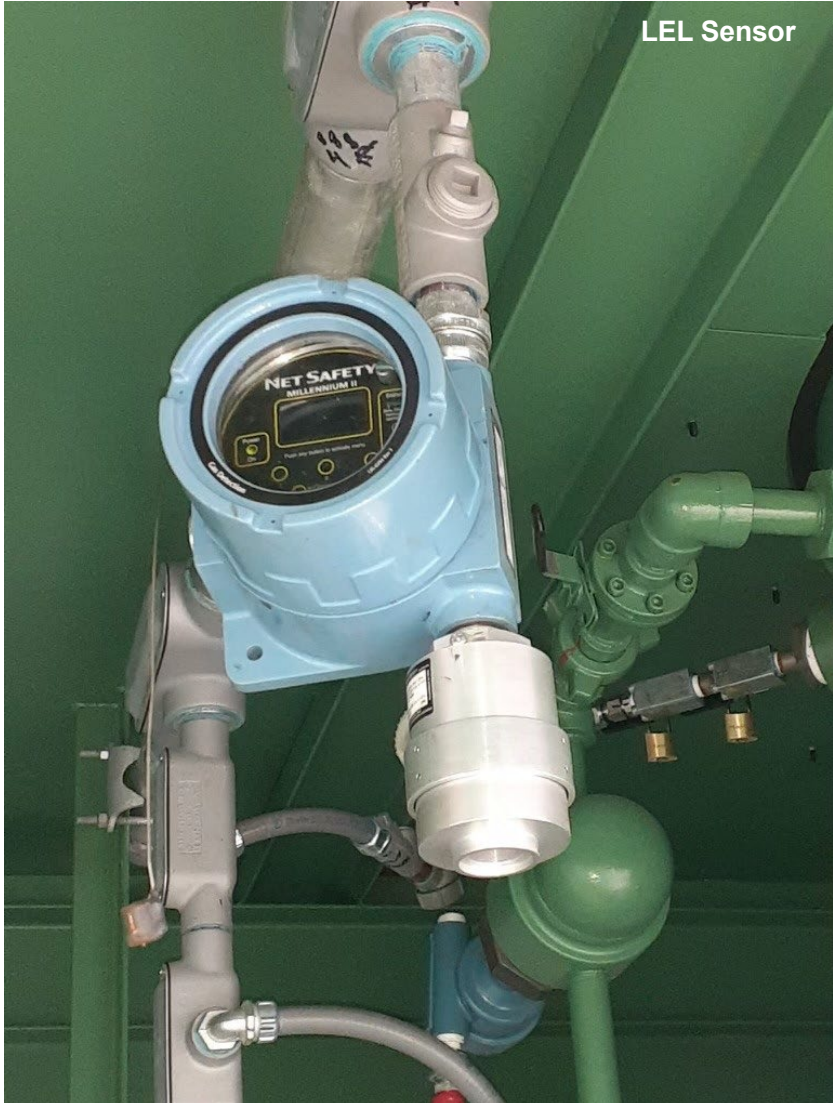
We are committed to the health and vitality of our local communities. We work where we live and raise our families, and are constantly focused on the highest standards of corporate responsibility and accountability.



Transparency

We believe that open communication is key to maintaining strong relationships. We see value in educating our customers, shareholders, employees and the larger community about all aspects of our work.

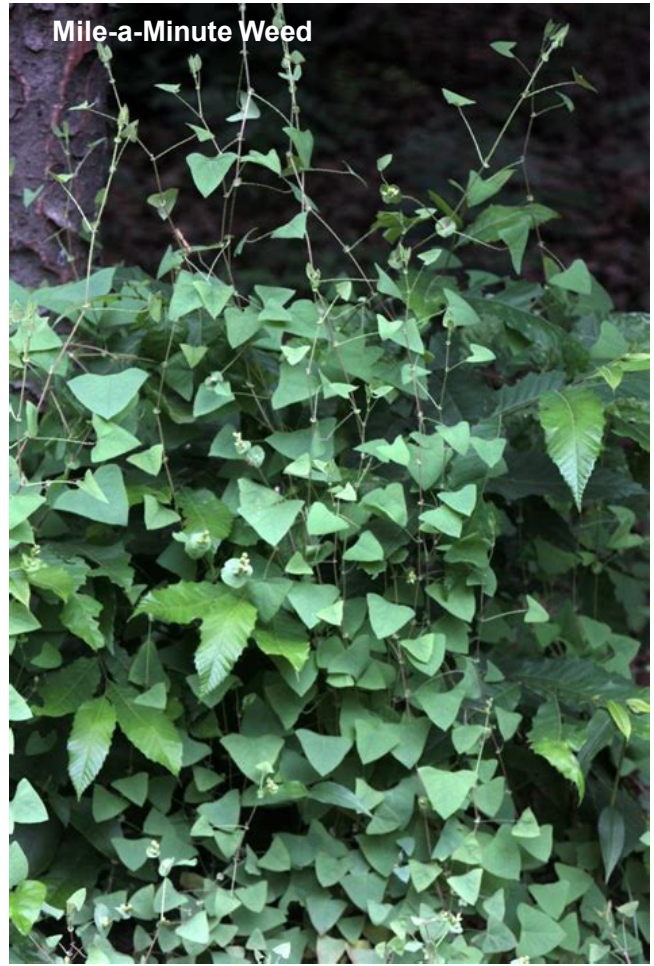
Environmental Stewardship



Environmental Stewardship



Environmental Stewardship



Environmental Stewardship



Environmental Stewardship



Natural Gas STAR Program (EPA) - Member Since: 2015



Methane Challenge (EPA) - Member Since: 2018



The Environmental Partnership (administered by the American Petroleum Institute) - Member Since: 2018



One Future - Member Since: 2021 (Part of NFG companywide membership)

- Seneca's 2020 Appalachia Production sector NGSi methane intensity was 0.085% (goal was 0.283%)



GTI Veritas - Member Since: 2022 (Part of NFG companywide membership)



Equitable Origin

- Achieved certification of all Appalachian assets in December 2021.
- Certification focuses on: 1) corporate governance and ethics, 2) human rights, social impacts and community, 3) Indigenous People's rights, 4) fair labor and working conditions, 5) climate change, biodiversity and environment.



TrustWell by Project Canary

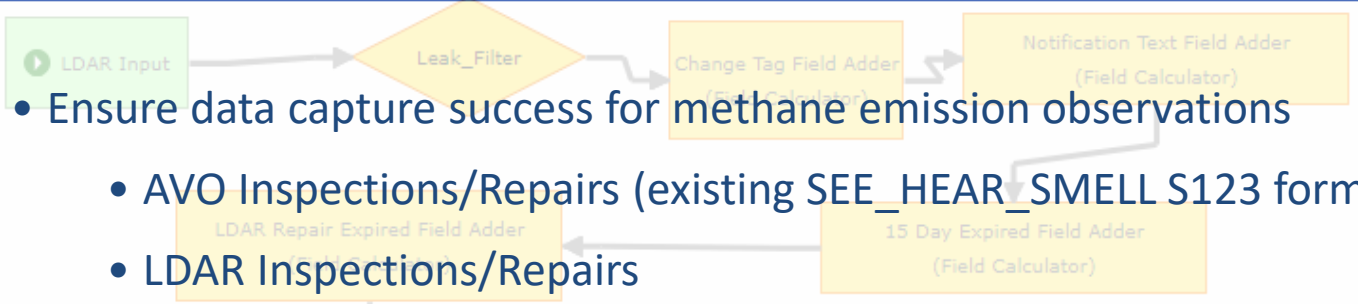
- Achieved certification of 12 pads (121 wells) in March 2022. Ten pads received platinum, 2 pads received gold (recently purchased pads that did not have ultrasonic and LEL detectors installed). Canary X continuous emissions monitoring devices were installed in November 2021 on three pads.
- Certification focuses on air, land, water, and community, with an emphasis on well design.



MiQ

- Certification audit commenced in April 2022. Expect certification results by the end of June 2022.
- Three main areas of focus: 1) Methane intensity, 2) Company practices as it relates to emissions management, and 3) Source and facility level emissions monitoring technology

What We Needed – MiQ Audit



- Ensure data capture success for methane emission observations
 - AVO Inspections/Repairs (existing SEE_HEAR_SMELL S123 form)
 - LDAR Inspections/Repairs
- Send out chain of command notifications
- Create a reporting system that supports follow up on leaks and repairs



Detection Notice Text picker (Field Calculator)





Integer Detection Calculator

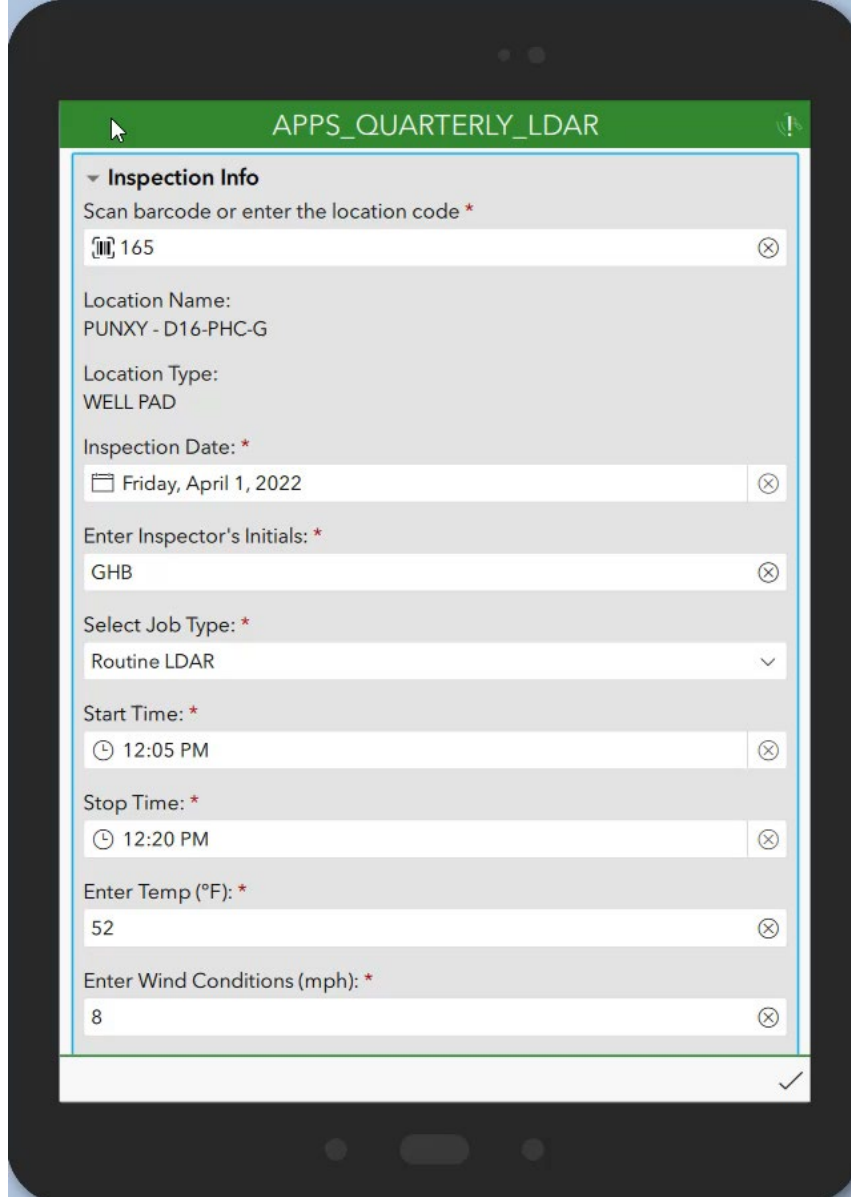
10day Notification Ne



OUR SOLUTION – DATA CAPTURE



<p>QUARTERLY LDAR</p>  <p>NW TIOGA - SYNNESTVEDT 878</p> <p>446 WELL PAD</p>	<p>QUARTERLY LDAR</p>  <p>NW TIOGA - WATKINS 820</p> <p>447 WELL PAD</p>
<p>QUARTERLY LDAR</p>  <p>PUNXY - D16-PHC-E</p> <p>164 WELL PAD</p>	<p>QUARTERLY LDAR</p>  <p>PUNXY - D16-PHC-G</p> <p>165 WELL PAD</p>



APPS_QUARTERLY_LDAR

▼ Inspection Info

Scan barcode or enter the location code *

Location Name:
PUNXY - D16-PHC-G

Location Type:
WELL PAD

Inspection Date: *

Enter Inspector's Initials: *

Select Job Type: *

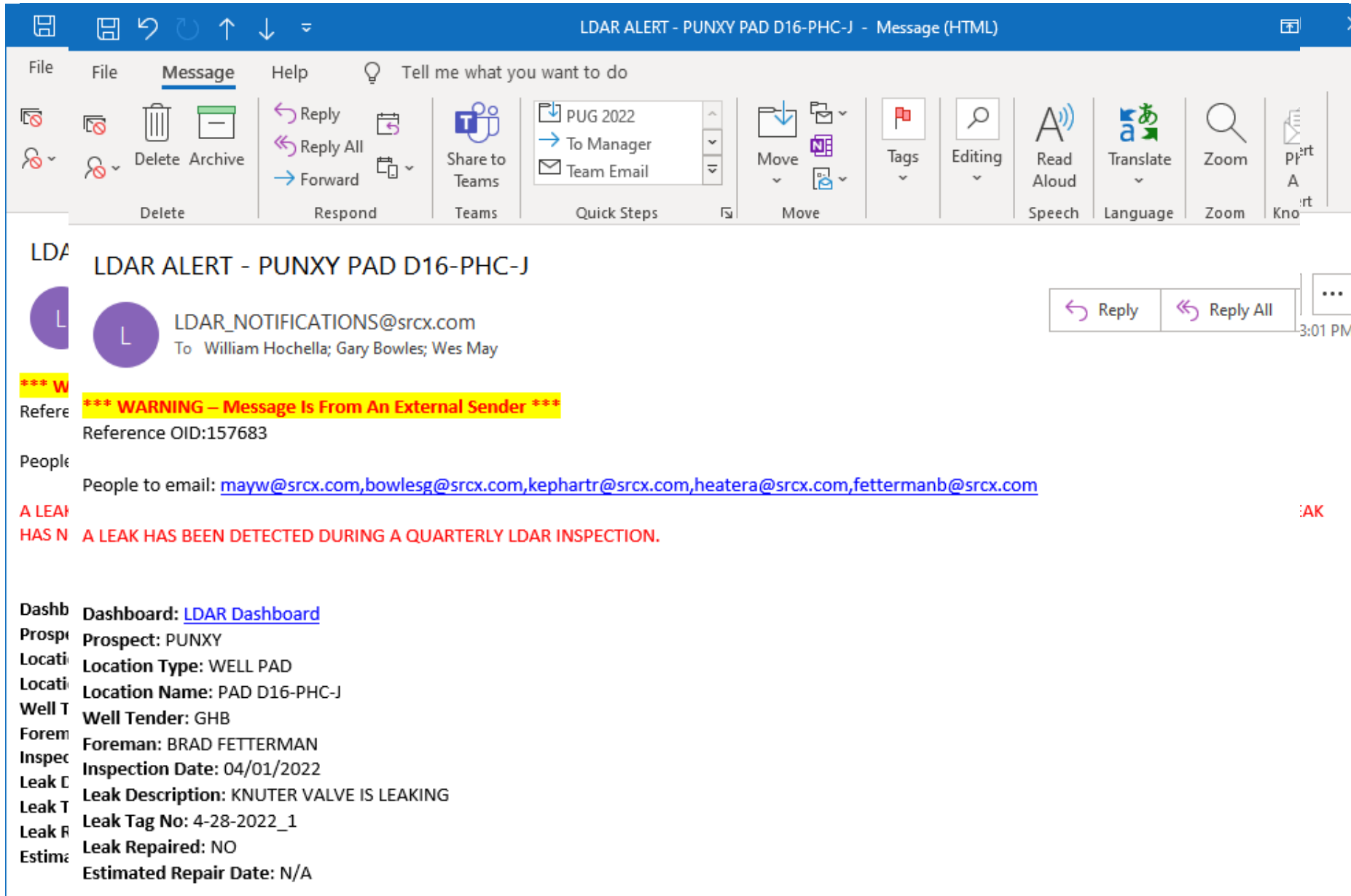
Start Time: *

Stop Time: *

Enter Temp (°F): *

Enter Wind Conditions (mph): *

OUR SOLUTION – CHAIN OF COMMAND NOTIFICATIONS



The screenshot shows an Outlook window titled "LDAR ALERT - PUNXY PAD D16-PHC-J - Message (HTML)". The ribbon includes "File", "Message", and "Help". The "Message" ribbon has buttons for "Delete", "Archive", "Reply", "Reply All", "Forward", "Share to Teams", "Move", "Tags", "Editing", "Read Aloud", "Translate", "Zoom", and "Print". The email content is as follows:

LDAR ALERT - PUNXY PAD D16-PHC-J

LDAR_NOTIFICATIONS@srcx.com
To: William Hochella; Gary Bowles; Wes May

***** WARNING – Message Is From An External Sender *****
Reference OID:157683

People to email: mayw@srcx.com, bowlesg@srcx.com, kephartr@srcx.com, heatera@srcx.com, fettermanb@srcx.com

A LEAK HAS BEEN DETECTED DURING A QUARTERLY LDAR INSPECTION.

Dashboard: [LDAR Dashboard](#)

Prospect: PUNXY

Location Type: WELL PAD

Location Name: PAD D16-PHC-J

Well Tender: GHB

Foreman: BRAD FETTERMAN

Inspection Date: 04/01/2022

Leak Description: KNUTER VALVE IS LEAKING

Leak Tag No: 4-28-2022_1

Leak Repaired: NO

Estimated Repair Date: N/A

GEOEVENT VIEWS

```
--#####  
--THIS IS THE 15 DAY+ REMINDER THAT A LEAK HAS NOT BEEN REPAIRED;  
--ONLY SENT IF ESTIMATED REPAIR DATE HAS NOT BEEN ENTERED;  
--ONLY SENT IF LEAK IS NOT REPAIRED/RESOLVED  
--THIS REMINDER WILL GO OUT ONCE PER DAY STARTING ON DAY 15  
--#####  
  
'A LEAK WAS DETECTED 15 DAYS AGO DURING A QUARTERLY LDAR INSPECTION AND HAS NOT BEEN REPAIRED. PLEASE ENTER AN ESTIMATED REPAIR DATE IF THE LEAK HAS NOT BEEN REPAIRED YET.'+  
' PLEASE ENTER THE ACTUAL REPAIR DATE WHEN THE REPAIR IS COMPLETED.' as NOTIFY_15_DAY_EMAIL_HEADER,  
  
CASE  
  when l.LEAK_REPAIR_DATE is null and l.EST_REPAIR_DATE is null and datediff(day,convert(Date,a.INSP_DATE),convert(Date,getdate())) >= 15 then 1  
  else 0  
END as NOTIFY_15_DAY_FLAG,  
  
L.NOTIFY_15_DAY_EMAIL_DATE,  
  
.....
```


GEOEVENT VIEWS



```
END as NOTIFY_REPAIR_OUTSTANDING_FLAG,

L.NOTIFY_REPAIR_OUTSTND_SENT_DATE,
--#####
--#####

CASE --used to determine if foreman is missing and if so we remove the last comma in the email string
  WHEN a.LOCATION_CODE >= 20000 then '██████████@srcx.com, ██████████@srcx.com, bowlesg@srcx.com, ██████████@srcx.com, ██████████@srcx.com'
  WHEN b.EMAIL is null then LEFT(CONCAT('██████████@srcx.com, bowlesg@srcx.com, ██████████@srcx.com, ██████████@srcx.com', ',' , b.EMAIL), |
  ELSE CONCAT('██████████@srcx.com, bowlesg@srcx.com, ██████████@srcx.com, ██████████@srcx.com', ',' , b.EMAIL)
END as EMAIL_RECIPIENTS,
--#####
--THIS IS THE HYPERLINK TO THE DASHBOARD
--#####
'<a href="https://gis.srcx.com/portal/apps/op dashboard/index.html#/f144c55f42cf4d72b8bef99c343c6657">LDAR Dashboard</a>'
AS DASHBOARD_LINK,
--#####
c.FOREMAN as PAD_FOREMAN,
A.[CREATED_DATE],
A.[CREATED_USER],
A.[LAST_EDITED_DATE],
A.[LAST_EDITED_USER],
A.[SHAPE],
L.[OBJECTID]
FROM LDAR_INSP_EVW a
JOIN LEAK_INFO_EVW l
  on l.parentrowid = a.uniquerowid
JOIN LDAR_INSP_HDR_VW c
  on a.uniquerowid = c.UNIQUEROWID
LEFT JOIN PAD_FOREMAN p
  on p.PAD_CD = c.PAD_CD
LEFT JOIN BA b
  on b.BA_ID = p.BA_ID
```

OUR SOLUTION – DATA REVIEW & EDITING



LDAR DASHBOARD

DATA FILTERS

Leak Detected?
Clear Selection

Leak Resolved?
NO

Select Prospect
Clear Selection

Select Pad Foreman
BRAD FETTERMAN

Select by Date
LAST 60 DAYS

INSPECTION DATA

PUNXY - PAD D16-PHC-J ROUTINE LDAR 4/1/2022
PUNXY - PAD D16-PHC-R ROUTINE LDAR 4/21/2022
PUNXY - PAD D17-COP-O ROUTINE LDAR 4/19/2022
PUNXY - PAD D17-COP-P ROUTINE LDAR 4/19/2022
PUNXY - PAD D17-SGL90-A ROUTINE LDAR 4/20/2022

Last update: a few seconds ago

LEAK/REPAIR DATA

Leak ID: 100H
Description: Knuter valve is leaking
Leak Resolved: NO
Repair Date:
Estimated Repair Date:

Last update: a few seconds ago

EDIT DATA

APPS_QUARTERLY_LDAR

Inspection Info

Scan barcode or enter the location code*

Location Name:
PUNXY - D16-PHC-J

Location Type:
WELL PAD

Inspection Date:*

Enter Inspector's Initials:*

Select Job Type:*

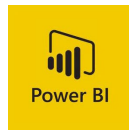
Last update: a few seconds ago

UPDATE EXISTING RECORD ADD NEW RECORD

```
m.uniquerowid
```

```
from LDAR_INSP_EVW m
left join LDAR_INSP_HDR_VW a
  on a.globalid = m.globalid
left join DOMAIN_FC_VW e
  on e.FEATURE_CLASS = 'LDAR_INSP'
  and e.FEATURE_CLASS_COLUMN = 'job_type'
left join DOMAIN_VALUES_VW e2
  on e2.DOMAIN_NAME = e.DOMAIN_NAME
  and e2.CODE = convert(nvarchar, job_type)
left join DOMAIN_FC_VW g
  on g.FEATURE_CLASS = 'LDAR_INSP'
  and g.FEATURE_CLASS_COLUMN = 'eq_visibility'
left join DOMAIN_VALUES_VW g2
  on g2.DOMAIN_NAME = g.DOMAIN_NAME
  and g2.CODE = convert(nvarchar, eq_visibility)
left join DOMAIN_FC_VW h
  on h.FEATURE_CLASS = 'LDAR_INSP'
  and h.FEATURE_CLASS_COLUMN = 'sky'
left join DOMAIN_VALUES_VW h2
  on h2.DOMAIN_NAME = h.DOMAIN_NAME
  and h2.CODE = convert(nvarchar, sky)
```

OUR SOLUTION – REPORTING



Navigation bar with icons for back, forward, refresh, zoom (100%), save, and print. Includes a search box labeled 'Find'.

START_DATE: 4/1/2022
 END_DATE: 4/1/2022
 PROSPECTS: BEECHWOOD
 FOREMEN: BR



Quarterly LDAR Inspection Summary : EDA Quarter 1-2022

Navigation bar with icons for back, forward, refresh, zoom (100%), and a search box.



SOURCE	INSPECTION TYPE	INSPECTION DATE	PROSPECT	LO
LDAR	ROUTINE	4/1/2022	PUNXY	PAD D16-F
AVO		4/5/2022	KRAUSE	PAD YORK
LDAR	ROUTINE	4/19/2022	PUNXY	PAD D17-C
LDAR	ROUTINE	4/19/2022	PUNXY	PAD D17-C
LDAR	ROUTINE	4/19/2022	PUNXY	PAD D17-C
LDAR	ROUTINE	4/20/2022	PUNXY	PAD D17-S
LDAR	ROUTINE	4/20/2022	PUNXY	PAD D17-S
AVO		4/20/2022	KRAUSE	PAD DETW
LDAR	ROUTINE	4/21/2022	PUNXY	PAD D16-F
LDAR	ROUTINE	4/25/2022	DCNR 007	PAD D
LDAR	ROUTINE	4/25/2022	DCNR 007	PAD D
LDAR	ROUTINE	4/25/2022	DCNR 007	PAD K
LDAR	ROUTINE	4/27/2022	WEST BRANCH	PAD E08-T
LDAR	ROUTINE	4/27/2022	HEMLOCK	PAD E08-D
LDAR	ROUTINE	4/27/2022	HEMLOCK	PAD E08-D

Executed By: HOUSTON\bowlesg
 Report: LDAR_AVO_UNRESOLVED_LEAKS

Summary

TOTAL EXPECTED INSPECTIONS	114
INSPECTIONS PERFORMED	87
INSPECTIONS MISSING	27
INSPECTIONS WITH LEAKS DETECTED	43

TAG #	DOR REASON	ESTIMATED REPAIR DATE
4-28-2022_1		
		4/5/2022
041922-02		
041922-03		
041922-01		5/4/2022
042022-02		
042022-01		
040722-01		4/22/2022
2022225-02		
2022225-01		5/10/2022
2022225-01		5/10/2022
042722-03		5/12/2022
042722-01		5/12/2022
042722-02		5/12/2022

BENEFITS & NEXT STEPS

BENEFITS

- Living our Guiding Principle for Environmental Stewardship
- Meeting Corporate/Regulatory Emission Reduction goals/requirements
- Continuous Improvement – Benchmark against a standard gives us a gauge for opportunities to improve

NEXT STEPS

- Data Analytics (LDAR/AVO)
 - Efficiencies (more uptime, more production)
 - Improved Pad design
 - Focused maintenance program
- New Dashboards and Reports to improve data review and reporting

