

Damage Prevention Event Report Analysis

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Good morning everyone, my name is Phil Young, I am joining you today from my home office in St. John's Newfoundland, where I work as a Regulatory Compliance Officer with the Safety and Damage Prevention Team.

For the last couple of months I have been collating Data from DPR report which I have analyzed and intend to share with you today.

Topics for Discussion

- **Data Quality**
- **DP Regulations(DPR) Event and Damage to Pipe (DTP) Overview**
- **Preventive Action Analysis**
- **DTP Cause Analysis**
- **Public Awareness**
- **Risk-Based Analysis**
- **Repeat Violators**

The presentation today will begin with a some basic comments on data quality and CER intentions when collecting DPR reports after which I will describe some more general and targeted analysis that I have completed with respect to:

General DPR reporting rates

Preventive causes in General

Causes related to Damage to Pipe Events

Data around Public Awareness efforts

A risk based analysis

And we will finish the portion of the workshop with some observations related to repeat violators

Data Quality

Observations by CER Inspectors



The CER Damage Prevention team analyzes DPR Reporting Data to focus our activities through the identification of themes.

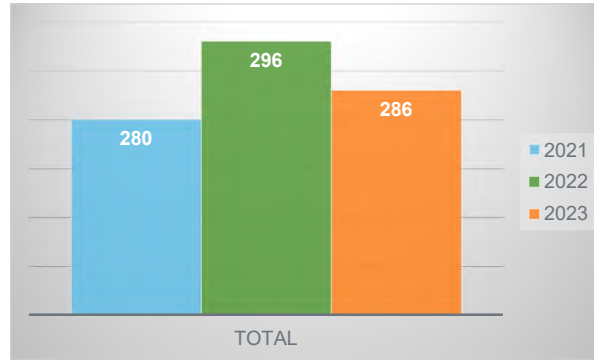
The Data analyzed in this presentation is aggregate of Calendar years 2021, 2022 and 2023 to date. We have not drawn any conclusions based on the information collected, but utilize it to ask meaningful question and to spark conversation and debate.

The data collected is submitted you, our regulated companies and its our hope that through this presentation and your own internal analysis, that the benefit of submitting quality reports will become evident.

General DPR/DTP Overview



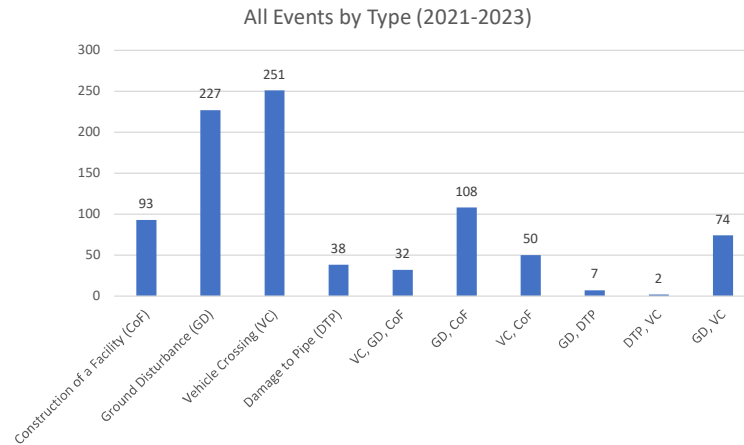
General DPR/DTP Data



Here we see the total events reported year over year

It appears that total event reports is slightly increasing with 2023 set to top 300 total events

General DPR/DTP Data



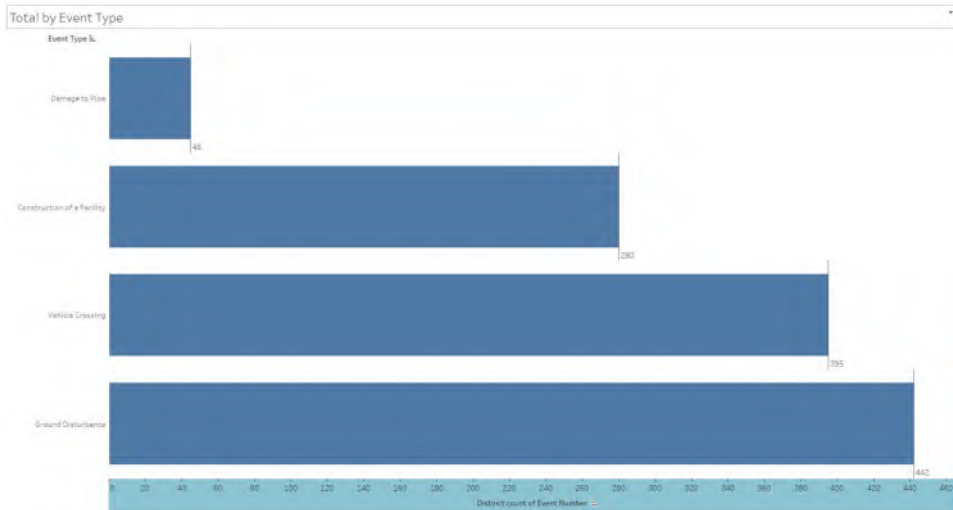
You can see from this graph that single event types accounts for 65 % of total events reported over the last three years.

35% of events have multiple event types.

This graphic causes me pause when I think about report quality. How many of the ground disturbance report should have had a vehicle crossing identified also. Same goes for Construction of a facility.

It is important that the entire contravention is captured when you report these events.

General DPR/DTP Data



When the multiple event types are counted individually the data tells us that ground disturbance is most reported, followed by Vehicle crossing, Construction of a facility and damage to pipe respectively.

So that's a general overview of the data collected lets know transition into some more targeted analysis

Preventive Action Analysis



Before we take a look at Preventive Action Analysis let review what tier 1 and tier 2 preventive action are:

Tier 1 PA are action taken to address causes at additional locations where similar or identical situations exist in order to proactively eliminate the identified risk.

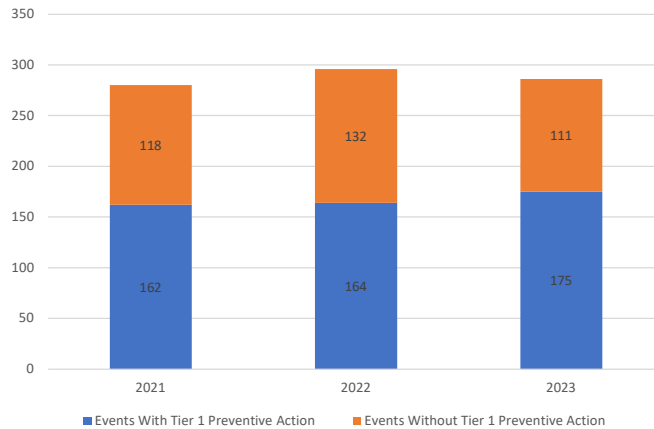
For example, a contravention at a residential development may reasonably result in a Tier 1 preventative action to prevent a similar occurrence as development continues and may specifically include increasing patrols at that location and/or establishing more effective lines of communication with a developer.

Tier 2 Preventive Actions - actions taken to address systemic causes; typically associated with changes that impact the entire company or pipeline.

For example, a contravention at the same residential development may lead a company to implement procedural changes into how required safety information is conveyed to developers and cascaded to sub-contractors. Refer back to Larry's safety moment for more information on the effective provision of safety information.

[Lets take a look at the numbers.](#)

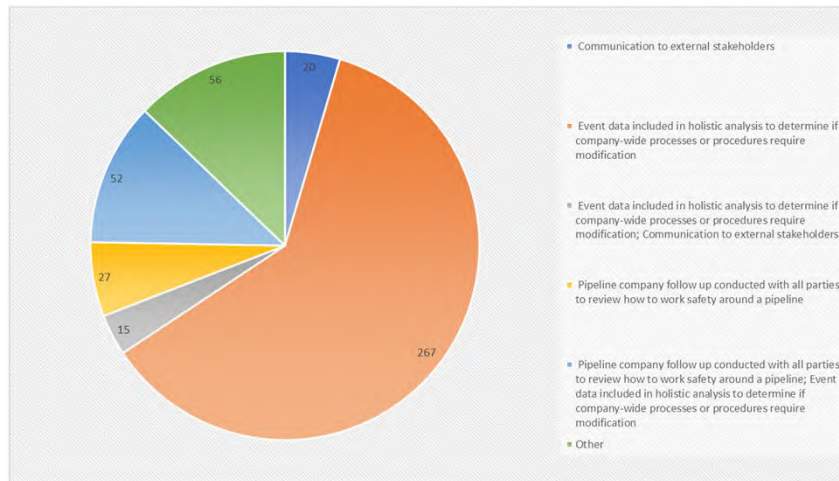
Tier 1 Preventive Action



In 58% of the events over the last 3 years Tier 1 preventive actions were identified. Meaning a little over 40 percent do not.

We will dig a little deeper into what actions companies are taking in the next few slides.

Tier 1 Preventive Actions

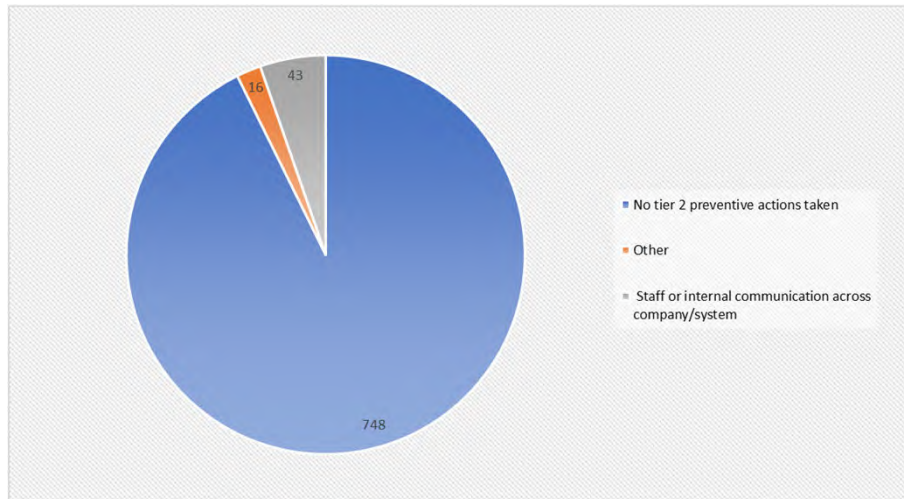


69% of events resulted in a tier 1 preventive action: to include the event data in holistic analysis to determine if company-wide processes or procedures require modification.

62% of the time this is the only preventive action selected

One could argue that simply included the event data in an analysis is not, in itself, a preventive action. It's the implementation of learning that is a result of holistic analysis that we are really interested in. Companies should be conducting this analysis as per OPR section 6.5(1) c and s. If anyone in the audience want to share a system improvement that has arisen from holistic data analysis, I'm sure the entire group would benefit from hearing examples of continuous improvement efforts.

Tier 2 Preventive Actions



93% of events do not identify tier 2 preventive actions

It is understood that not all DPR events are created equal and that each company may handle events differently. It is required however that the methodology to addressing these events is logical and systematic. The CER requires Detailed event reports that include basic cause, corrective action at minimum. We do expect that, preventive actions are taken to improve the company's managements system when warranted.

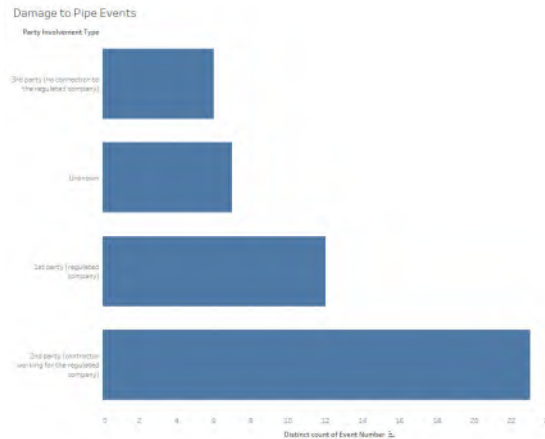
Companies should be prepared to describe and defend their internal classification system of Damage Prevention Regulation Events and how the system triggers a response, including the assembly of investigative teams to conduct fulsome root cause analysis and investigations when required. In future workshops it would be great if any of our companies were willing to share their risk matrices, classification systems and investigation standards as they relate to DPR events.

DTP Basic Cause Analysis



Next up we will drill down into what is causing Damage to Pipe Events.

DTP Damaging Party



Before we look into a cause analysis for Damage to pipe events it is important to note that Approximately 75% of Damage Events have been attributed to 1st and 2nd party activities. That tells us that these event occurred under some level of oversight by the Regulated Company.

It is understood that oversight may vary, and include basic contractor pre-qualification and selection, intermittent company inspection and auditing and/or total direct supervision of work.

DTP Basic Cause

Cause	Column
Job or System Factors-Inadequate work planning/preparation and/or work execution	32
Personal Factors-Lack of knowledge	18
Job or System Factors-Inadequate leadership and/or supervision	16
Job or System Factors-Inadequate work policies, standards, procedures, or instructions-inadequate maintenance	12
Job or System Factors-Inadequate Communications-Inadequate communication between parties	9
Historical Damage (cause unknown);	6
External Interference-Weather Related	4
Personal Factors-Improper motivation-Improper attempt to save time or effort;	4
Personal Factors-Lack of skill	4
Job or System Factors-Inadequate Communications-Inadequate communication of safety and health data, regi	3
Personal Factors-Abuse or misuse-Improper conduct that is not condoned-Unintentional;	3
Job or System Factors-Inadequate tools or equipment-Inadequate adjustment or repair or maintenance;	1
Job or System Factors-Inadequate tools or equipment-Inadequate standards or specifications;	1
Personal Factors-Abuse or misuse-Improper conduct that is not condoned-Intentional	1
	114



In the CER system, Basic Cause Data is collected in three buckets. They are

- Job or System Factors
- Personal Factors
- External Interference

In damage to pipe reports **Job or system factors** related to work planning have been cited in 28% of events and supervision has been cited in 14% of events. Personal factors related to knowledge have been cited in 16% of reported events.

We will drill down into these top three causes in the next few slides

Inadequate work planning/preparation and/or work execution

Basic Cause	Count
Inadequate assessment of needs and risks;	11
Inadequate assessment of operational readiness	1
Inadequate evaluation of changes	3
Inadequate identification and evaluation of loss exposures;	1
Inadequate matching of individual qualifications and job or task requirements;	2
Inadequate monitoring of initial operation;	2
Inadequate or improper controls;	8
Inadequate orientation and/or training;	4

So what does the data tell us about work planning? Risk assessment and control adequacy are the most frequently identified root causes in DTP events.

We encourage companies to look at their own data to determine if opportunities exist to work internally and with your contractors to address these two very fundamental elements of risk management.

Lack of Knowledge

Basic Cause	Count
Lack of situational awareness	11
Unaware of regulation	3
Lack of experience	2
Inadequate orientation	1
Inadequate initial training	1

You may have been scratching your heads as to how the lack knowledge category was identified as a top three root cause.

Companies are telling us that a **lack of situational awareness** is at the root of many DTP events.

For me this This brings to mind things like worker experience, communication, production pressure and resources allocation and fitness for duty (stress, fatigue, distraction, impairment), but again, it is up to the regulated companies to analyze their own data and mine the diamonds that may be buried within it

Inadequate leadership and/or supervision

Basic Cause	Count
Inappropriate or insufficient consideration of risk	5
Improper or insufficient monitoring by leader(s);	3
Lack of leader/supervisory job knowledge;	3
Providing inadequate reference documents, directives and guidance publications;	2
Unclear or conflicting assignment of responsibility;	2
Providing inadequate policy, procedure, practices or guidelines;	1

Here again we see issues associated with risk assessment, but this time its in a leadership context.

It goes without saying that Its critical that your leaders possess the appropriate training, skills and experience to provide effective oversight.

Public Awareness

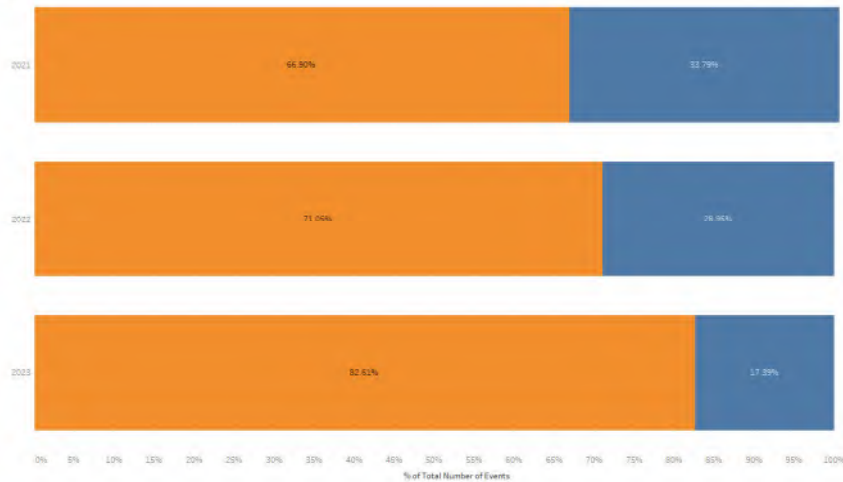


The next few slides speak to public awareness efforts

Percentage of Events where Contravener is on PA List

Landowners on PA List - Per Year

Year of Rep...



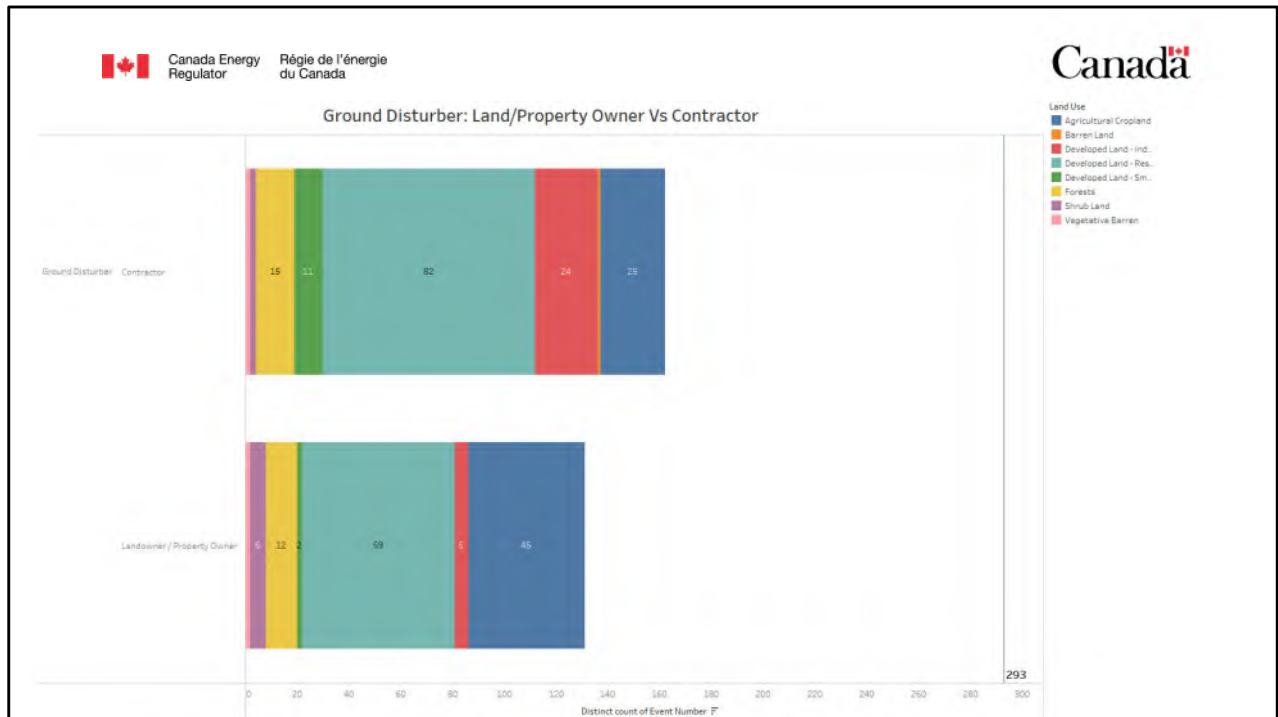
This slide indicates that the number of events where landowners are **not** on the PA list is going down. That's good right?

Maybe, but as we saw in our opening slide that the total number of events per year is trending up. Companies need to continuously be challenging the efficacy of their programs.

2021 - 280

2022 - 296

2023 - 285 to date

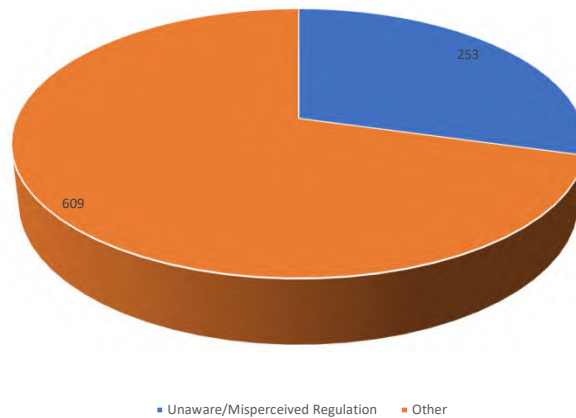


This slide demonstrates the distribution of DP events between Property owners and third party contractors and potentially highlights an opportunity to target public awareness efforts.

In both cases, around half of events (represented in teal) are occurring in developed residential areas. Not terribly surprising.

What are some indicators we look for in the data related to Public Awareness programs?

UA Basic Cause: Unaware/Misperceived Regulations



Again we are back to basic cause reports.

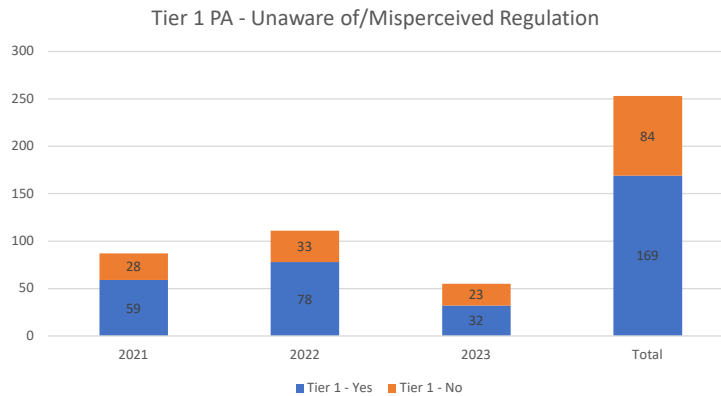
The goal of every PA program is to communicate the requirements of living and working near pipelines and ensuring that those requirements are understood.

With that being said, regardless of the party involved we have seen 1/3 of all Basic Causes include either

1. Unaware of the regulations
2. Misperceived regulations.

When CER staff are reviewing DP event and see either of these basic causes we immediately look to the justification section to understand how and why the contravening party was unaware of their obligations.

Unaware of/Misperceived Regulations– Tier 1 Preventive Actions



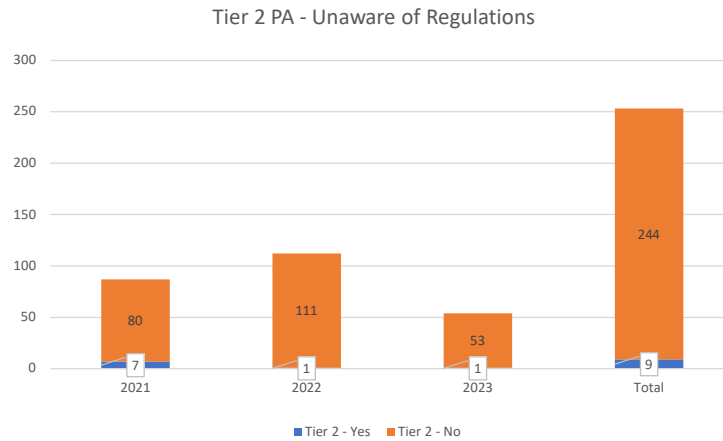
Not only should companies be drilling down to understand why a regulation was unknown or misperceived but they should also be self-reflecting, and when required, making changes to PA programs to address the causes of unauthorized activities attributed to gaps in public awareness programs.

Gap closure related to PA programs would typically be captured in Tier 1 and 2 preventive actions which were discussed earlier

And we do see 2/3 of the events caused by misperceived and unknown regulations have identified Tier 1 preventive actions.

However, as we have seen with the DPR events in general that action is most often, simply, the inclusion of the data in holistic analysis.

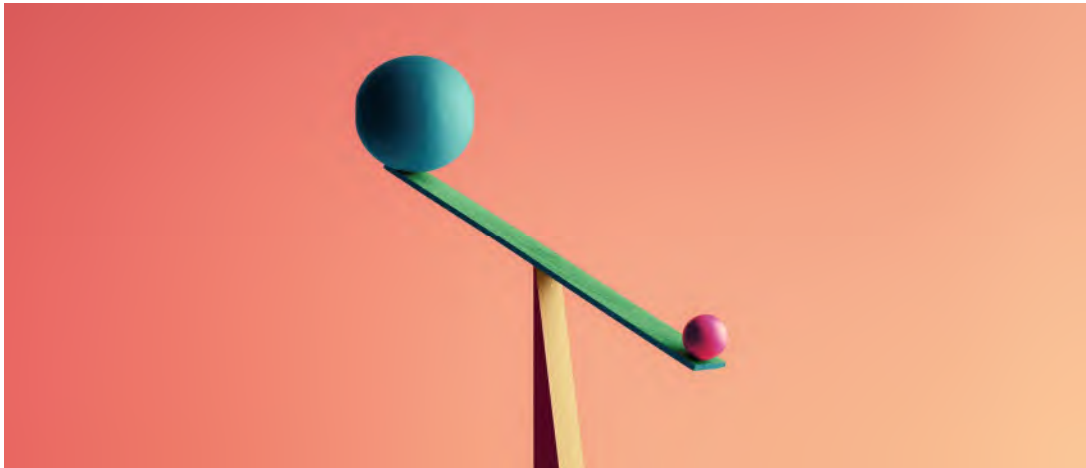
Unaware of/Misperceived Regulations– Tier 2 Preventive Actions



And The rates at which companies are identifying tier 2 preventive actions are almost nil.

We are hoping that all of the holistic analysis that is occurring is leading to meaningful continuous improvement opportunities.

Risk Based Analysis



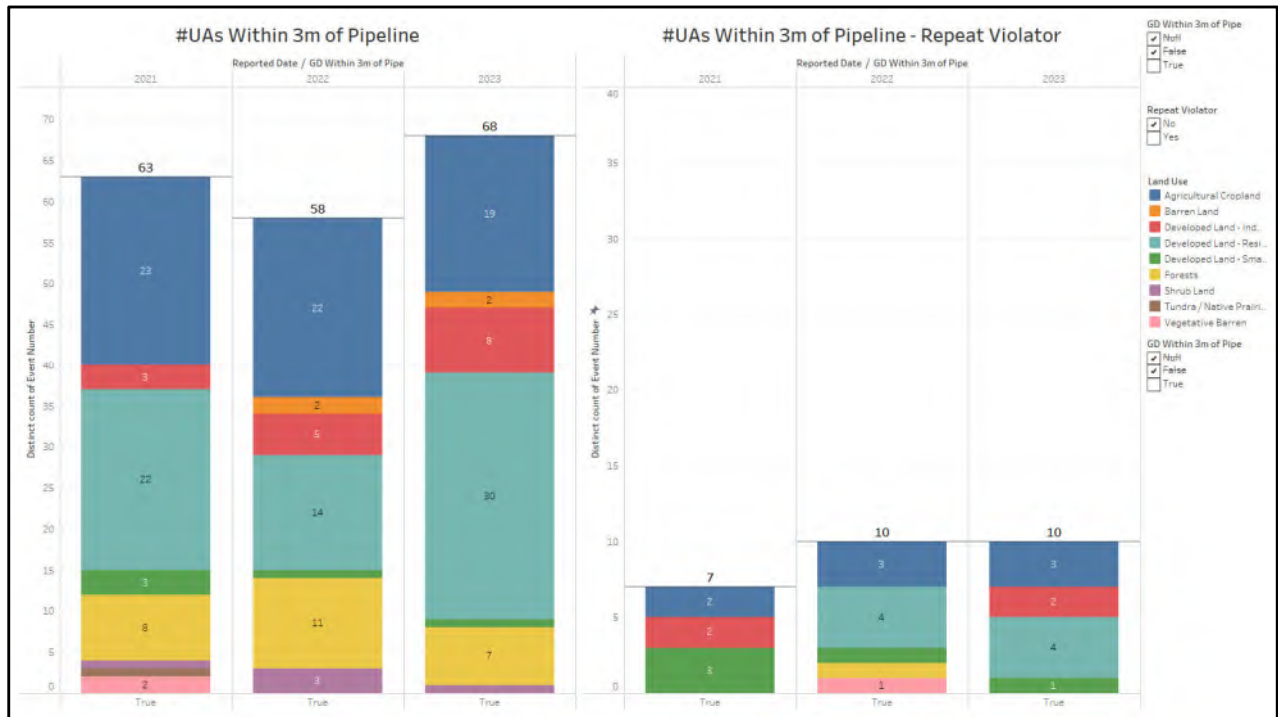
When I say risk based analysis we are essentially considering 3 variables that will impact a risk assessment.

Proximity of a ground disturbance to a pipeline, the excavation method and the behavior of the contravener can all be argued to raise the probability of a line strike or rupture.

Of course, the severity of a rupture would depend on the receptor, product carried, the operating pressure and the class location etc. – Severity variables are not considered in the following slides.

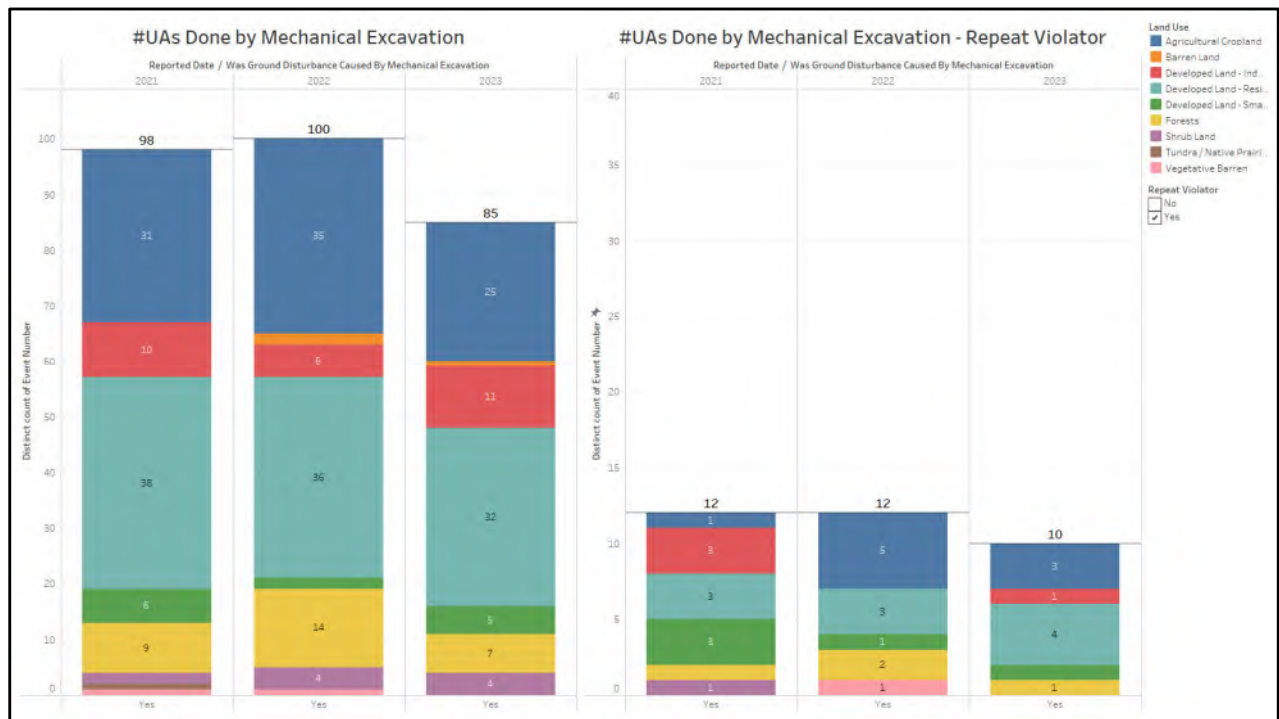
With that said, We are very interested in how our companies assess the potential risk associated with an unauthorized activity. It is understood that a CER reportable event could carry next to no potential for harm, while others can be considered near hits with catastrophic potential.

Lets take a look at some variables impacting probability or likelihood of harm.



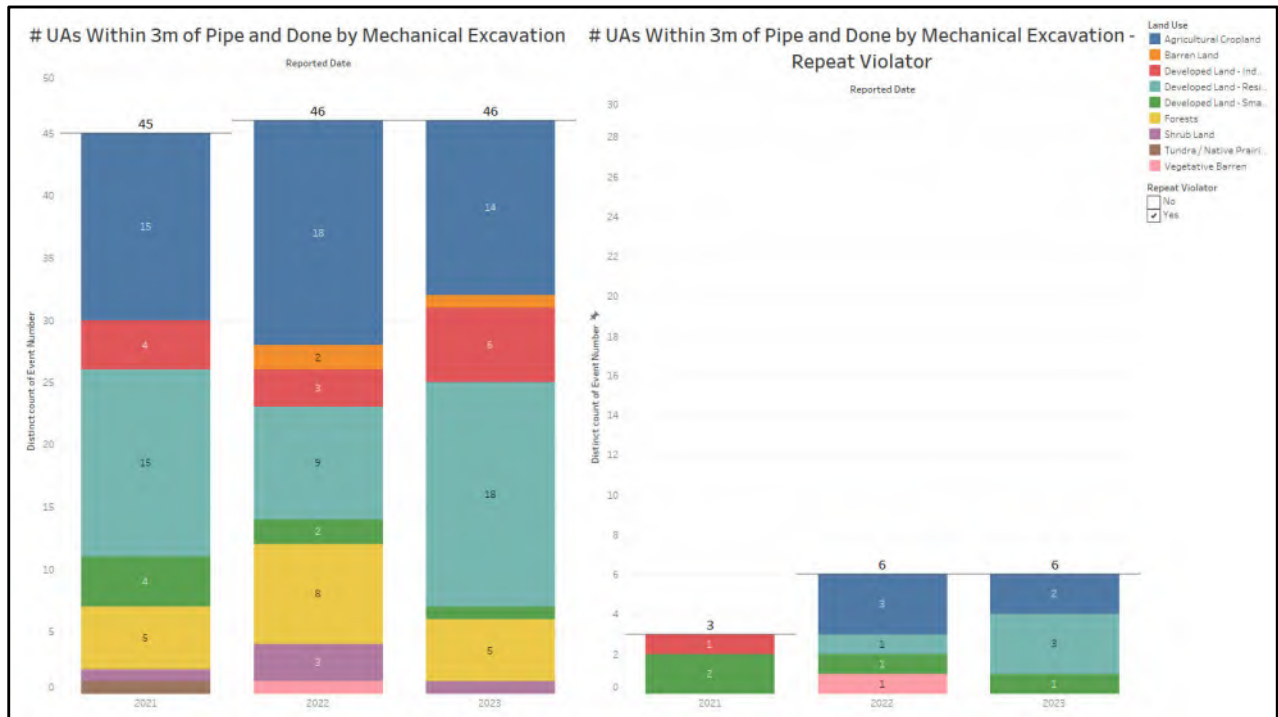
On the left side of the slide we see the 3 year totals of GD within 3 meters of the pipe.

On the right we learn, that on average, 15% of ground disturbance within 3 meters of pipe is conducted by a repeat violator.



On the left side of this slide we see the year over year total of GD caused by mechanical excavation

Approximately 12% of unauthorized mechanical excavation is conducted by a repeat violator



Finally, here we see the total numbers of both Near hits within 3 meters by mechanical excavation

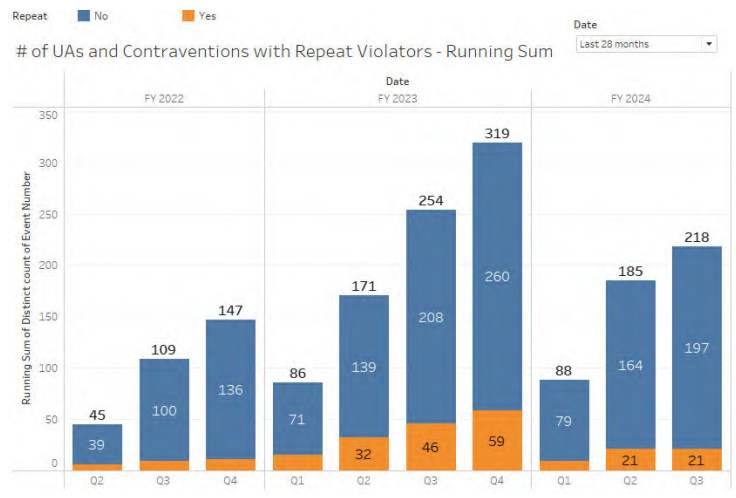
11% of mechanical excavation done with 3m of the pipe is conducted by a repeat violator.

Repeat Violator



Lets look closer at some date regarding repeat violators

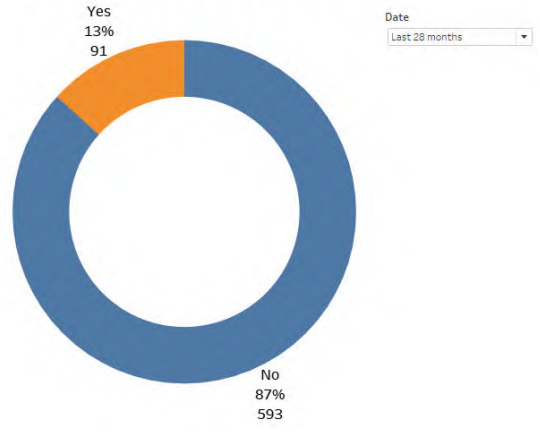
Repeat Violator



The orange bar in each column represents the fraction of events that involve a repeat violator

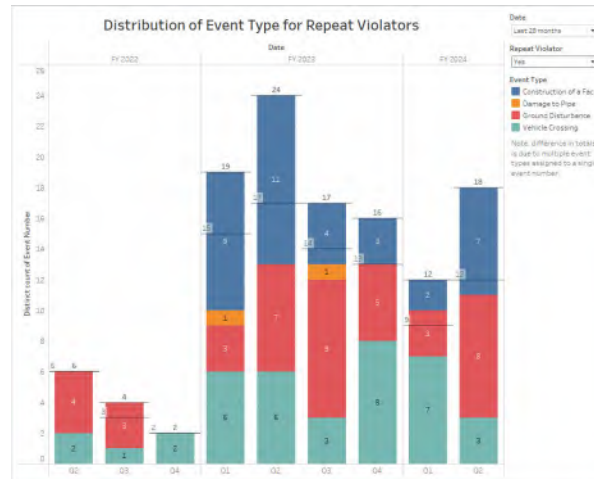
Repeat Violator

Percentage of Repeat Violators



Holistically that adds up to about 13% of all UAs in the last 28 months have involved repeat violators

Repeat Violator



On this slide we see the distribution of event type amongst repeat violators. Its probably no surprise that we see a spike of events in q2 of the fiscal year.

So I hope the slides have given you something to think about. They will be available for distribution so that you can take a closer look.

If there is something in the data that can support your efforts and initiatives then that's great.

We at the CER will continue to analyze the data as this information does inform our strategic plan.

I'll end my presentation on the same note I began with.

The integrity of the data is key. Quality reports will result in quality analysis and meaningful learning for all of us.

Thank you.



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