# PIPELINE INCIDENT DATA VISUALIZATIONS

#### **USING VISUALIZATION TO HELP GOVERNMENTS DEMOCRATIZE DATA**



**DR. WESLEY WILLETT** UNIVERSITY OF CALGARY

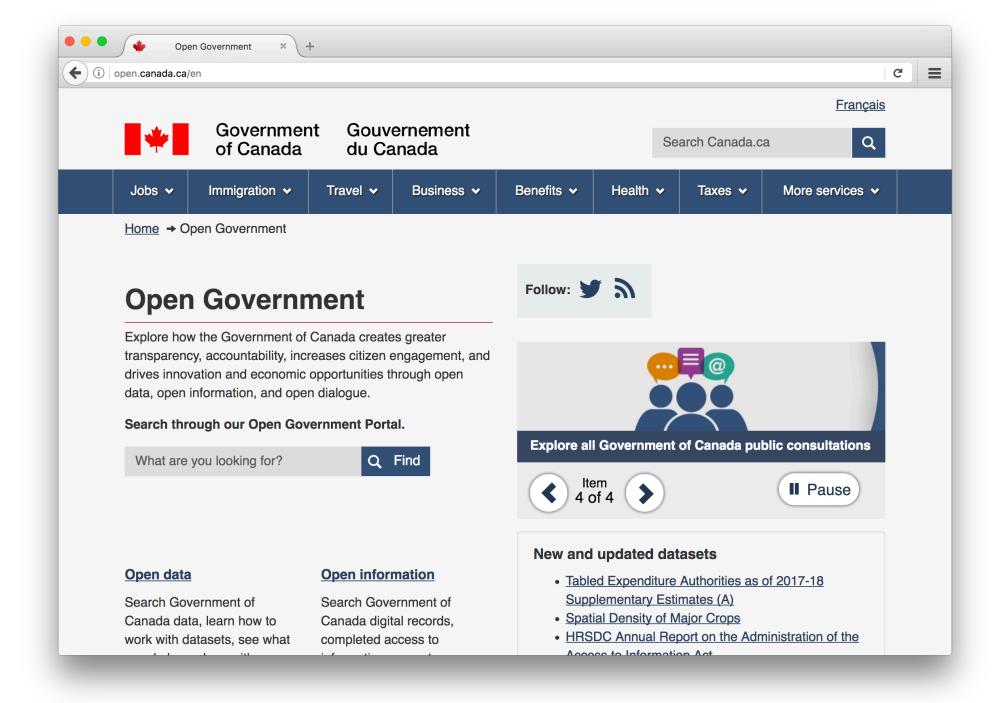


Office national de l'énergie



National Energy Board

# **GOVERNMENTS GENERATE** LOTS OF DATA BUT CURRENT OPEN DATA PRACTICES **LIMIT CITIZEN UNDERSTANDING** AND REDUCE ACCOUNTABILITY



	a Nearest Popi Province Company Status	Latitude	Longitude Approximate Substance Release Type Signif	ificant Year	Occurrence I Discovered I Detailed imm Immediate c Detailed basi Basic cause c Durati			in How the inci Close				ub Released vol Pipe body re R
INC2007-097 Release of St 1/2/2008	Grande Prair Alberta Alliance Pipe Closed				2008 2007/12/27 (2007/12/27 (Damage or d Cracking Job or system Maintenance NULL	NULL	NULL		/2012 Ye		Release of St Natural Ga	
INC2008-001 Release of St 1/2/2008	Cromer Manitoba Enbridge Pip Closed		5 -101.23557 8 Crude Oil - Sv Llquid No		2008 2008/01/02 2008/01/02 Damage or d Internal Corr Job or system Maintenance NULL	NULL	NULL	Employee / (1/11/			Release of SL Crude Oil -	
INC2008-004 Release of St 1/23/2008			5 -101.23557 100 Crude Oll - S Liquid No 2 -122.69433 Not Providec Natural Gas - Gas No		2008 2008/01/23 (2008/01/23 (Damage or d Equipment F Job or system Maintenance NULL	NULL	NULL	Employee / 08/10/ Employee / 07/27/			Release of St Crude Oil -	
INC2008-008 Release of St 1/29/2008 INC2008-009 Release of St 1/29/2008					2008 2008/01/26 2008/01/26 Damage or d Material Def Job or system Maintenance NULL 2008 2008/01/27 2008/01/27 Damage or d Equipment F Job or system Maintenance NULL	NULL	NULL		3/2012 No		Release of St Natural Ga Adverse Envi Potassium	
INC2008-016 Release of St 2/23/2008			9 -113.53526 Not Provided Natural Gas Gas No		2008 2008/02/22 2008/02/23 Damage or d Material Def Job or system Maintenance NULL	NULL	NULL	Employee / 07/27/			Release of Sc Natural Ga	
	Moosomin Saskatchewa TransCanada Closed		9 -101.48731 100 Natural Gas Gas No		2008 2008/02/25 2008/02/25 Damage or d Incorrect Op Job or system Standards an NULL	NULL	NULL	Employee / C1/19/			Release of Sc Natural Ga	
INC2008-020 Release of St 3/3/2008	Dryden Ontario TransCanada Closed		4 -92.76549 Not Providec Natural Gas - Gas No		2008 2008/03/02 2008/03/02 Damage or d Cracking Job or system Maintenance NULL	NULL	NULL	Employee / C7/27/			Release of Sc Natural Ga	
INC2008-021 Release of St 3/3/2008	Smooth Rock Ontario TransCanada Closed				2008 2008/03/01 (2008/03/01   Damage or d Equipment F Job or system Maintenance NULL	NULL	NULL		/2011 Ye		Release of St Natural Ga	
INC2008-027 Release of St 3/14/2008	Rapid City Manitoba TransCanada Closed				2008 2008/03/14 (2008/03/14 ( Damage or d Cracking Job or system Maintenance NULL	NULL	NULL	Employee / C7/23/			Release of St Natural Ga	
INC2008-03C Fatality 3/24/2008	Kerrobert Saskatchewa Enbridge Pip Closed	51.92095	5 -109.17023 Not Applicab Not Applicab Not Applicab Yes		2008 2008/03/24 2008/03/24 Substandard Incorrect Op Job or system Leadership a NULL	NULL	NULL	Employee / 012/15	5/2010 No	o No	Fatality NULL	NULL NULL N
INC2008-034 Release of St 4/1/2008	Haileybury Ontario TransCanada Closed	47.44678	8 -79.76267 Not Provided Natural Gas - Gas No		2008 NULL 2008/03/31 Damage or d Cracking Job or system Engineering NULL	NULL	NULL	NULL 7/23/	/2012 Ye	es No	Release of St Natural Ga	s - 0 No N
INC2008-037 Release of St 4/18/2008	Kenora Ontario TransCanada Closed	49.80823	3 -94.18954 Not Provided Natural Gas - Gas No		2008 2008/04/16 2008/04/16 Damage or d Material Def Job or system Individual Fa NULL	NULL	NULL	Employee / C7/27/	/2012 Ye	es No	Release of St Natural Ga	s - 0 No N
INC2008-039 Release of St 4/21/2008	Regina Saskatchewa Plains Marke Closed	50.48057	7 -104.56646 4 Crude Oil - S Liquid No		2008 2008/04/21 2008/04/21 Damage or d Equipment F Job or system Maintenance NULL	NULL	NULL	Employee / (7/23/	/2012 No	o No	Release of St Crude Oil -	S 4 No N
INC2008-040 Release of St 4/25/2008	Charlie Lake British Colun Westcoast El Closed	56.27973	3 -120.96341 Not Provided Natural Gas Gas No		2008 2008/04/24 2008/04/24 Damage or d Material Def Personal fact Individual Fa NULL	NULL	NULL	Employee / (1/19/	/2011 Ye	es No	Release of St Natural Ga	s 0 No N
INC2008-041 Release of St 4/25/2008	Chetwynd British Colun Westcoast Er Closed	55.33867			2008 2008/04/15 2008/04/15 Damage or d Equipment F Job or system Maintenance NULL	NULL	NULL	Employee / 08/15/	/2012 Ye	es No	Release of Sc Natural Ga	s 0 No N
INC2008-043 Fire 5/1/2008	Cromer Manitoba Enbridge Pip Closed				2008 2008/05/01 2008/05/01 Substandard Operating Cc Job or system Maintenance NULL	NULL	NULL	Employee / 07/23/			Fire NULL	NULL NULL N
INC2008-045 Release of St 5/6/2008	Herschel Saskatchewa Enbridge Pip Closed				2008 2008/05/06 2008/05/06 Damage or d Material Def Job or system Standards an NULL	NULL	NULL	Employee / (7/23/			Release of SL Crude Oil -	
INC2008-048 Release of St 5/12/2008	-		6 -104.61447 7 Crude Oil - S Liquid No		2008 2008/05/11 2008/05/11 Damage or d Equipment F Job or system Engineering (NULL	NULL	NULL	Employee / C8/10/			Release of SL Crude Oil -	
INC2008-052 Fire 5/21/2008					2008 2008/05/18 ( 2008/05/18 ( Damage or d Equipment F) Job or system Maintenance NULL	NULL	NULL	Employee / C3/27/			Fire NULL	NULL NULL N
INC2008-055 Adverse Envi 5/31/2008			4 -120.37265 Not Applicab Not Applicab Not Applicab No		2008 2008/05/31 (2008/05/31 (Damage or d Equipment F Job or system Maintenance NULL	NULL	NULL	3rd Party / O 11/13			Adverse Envi NULL	NULL NULL N
INC2008-056 Release of St 6/5/2008 INC2008-057 Release of St 6/6/2008	Edmonton Alberta Enbridge Pip Closed		1 -113.35401 8 Crude Oil - S Liquid No 8 -79.57985 270 Natural Gas - Gas No		2008 2008/06/05 (2008/06/05 (Damage or d Equipment F Job or system Maintenance NULL 2008 2008/05/05 (2008/06/05 (Damage or d Cookies Links or purchas Standard on NULL)	NULL	NULL	Employee / 07/23/			Release of St Crude Oil -	
INC2008-057 Release of SU 6/6/2008 INC2008-058 Adverse Envi 6/9/2001					2008/2008/06/06 2009 05 /06 Damage or d Cracking Job or system Standards an NULL			Employee / 07/23/			encase of schatural Ga	NULL NULL N
INC2008-058 Adverse Envi 6/9/200 INC2008-060 Release of St 6/12/20			7 Not Prov					Public				NULL NULL N
INC2008-062 Fire 6/24/2			1 Not Apr					Employee				NULL NULL N
INC2008-062 File 6/25/2008			7 Not App		2009 08/06/24 (Subar			Employee			Fatality	NULL NULL N
INC2008-067 Release of St 7/6/2008					12 ( Dama 23   Sub 200 08/07/06 ( Subs 08/07/06 ( Dama 08/07/09 ( Dama 19/07/29   Dama			Employee			Fatality UL Release of the Oil - Belease of the Oil -	
INC2008-070 Release of St 7/17/2008			7 Not Prov		008/07/16 (Damager			Employee			Release of tural Ga	
INC2008-072 Release of St 7/18/2008	Al. noe Pipe Cici				008/07/09 (Damage			Imployee			Release of tural Ga	
INC2008-075 Release of St 7/23/2008	Edn dge Pip Cio				08/07/23 (Dame						Release of sel Fuel	2 No N
INC2008-078 Release of St 7/31/2008	Hearst Scanada Clos		5 Not Prov		08/07/29 Damag	NU					Release of tural Ga	s- 0 No N
INC2008-075 Release of St 8/8/2008	Herbert Saskatchewa Spectra Ener Closed		2 -107.30766 0.5 Propane Gas No		2008 2008/07/12 2008/07/12 Damage or d Equipment F Job or system Maintenance NULL	NULL	NULL				Release of SUPropane	0.5 No N
INC2008-080 Serious Injur 8/15/2008	Valemount British Colun Trans Mount Closed	53.024796	6 -119.1512 Not Applicab Not Applicab Not Applicab Yes		2008 2008/08/14 2008/08/14 Substandard Incorrect Op Personal fact Individual Fa NULL	NULL	NULL	Employee / C12/15	5/2010 No	o No	Serious Injur NULL	NULL NULL N
INC2008-084 Fire 8/26/2008	Not specified Saskatchewa Enbridge Pip Closed		3 -106.35299 Not Applicab Not Applicab Not Applicab No		2008 2008/08/25 2008/08/25 Substandard Operating Cc Job or system Maintenance NULL	NULL	NULL	Employee / ( 8/15/			Fire NULL	NULL NULL N
INC2008-085 Fire 9/4/2008	Not specified Saskatchewa Enbridge Pip Closed		31 -107.37839 Not Applicab Not Applicab Not Applicab No		2008/2008/09/04 12008/09/04 1Damage or d Equipment Flab or system Engineering INULL	NULL	NULL		1/2010 No		Fire NULL	NULL NULL N
INC2008-086 Release of St 8/28/2008	Vermilion Ba Ontario TransCanada Closed		No.		al fact inc. system Standa al fact Engine system Engine system Standa system Standa system Standa system Mainta				/2011 Ye		Release of Sc Natural Ga	
INC2008-087 Release of St 9/5/2008	Taylor British Colun Westcoast Er Closed		No		al fact Individual				/2012 Ye		Release of SL Butane	0.1 No N
INC2008-091 Serious Injur 9/16/2008			oplicab plicab Yes		systemStanda				/2012 Ye		Serious Injur NULL	NULL NULL N
INC2008-092 Serious Injur 9/16/2008	Valemount British Colum Trans Mount Closed		officab Yes		al fact Engine				2008 No		Serious Injur NULL	NULL NULL N
INC2008-095 Release of St 9/26/2008 INC2008-093 Fire 10/7/2008			No		system Engine				/2012 Ye		Release of St Natural Ga	
INC2008-097 Fire 10/7/2008 INC2008-098 Release of St 10/16/2008	Huntsville Ontario TransCanada Closed Portage La Pi Manitoba TransCanada Closed		pricab No		system Mainto				/2010 Ye /2012 Ye		Fire NULL Release of SL Natural Ga	
INC2008-098 Release of St 10/16/2008 INC2008-103 Release of St 11/4/2008	-		NO No		System Standa				2012 Ye 2012 Ye		Release of Sc Natural Ga	
INC2008-105 Release of Sc 11/4/2008 INC2008-105 Fire, Release 11/20/2008			2 -120 pp 12 0 usis Mixed HVP H Gas No		2008 2008/11/12/2008/11/12/2008/11/12/2008/2019/2008/2019/2019/2019/2019/2019/2019/2019/2019	NULL	NULL		/2012 Ye		Fire, Release Mixed HVP	
	Fort Nelson British Colum Westcoast Er Closed		6 -121.5963 10 Condensate Liquid No		2008 2008/11/20 2008/11/20 Substandard Incorrect Op Job or system Maintenship a NULL	NULL	NULL	Employee / 08/15/			Release of St Condensat	
	3 Chetwynd British Colum Westcoast Er Closed		2 -121.94466 10 Amine Miscellaneor No		2008 2008/11/26 (2008/11/26 (Damage or d Material Def Job or system Maintenance NULL	NULL		the second second second second				10 No N
	8 McLeod Lake British Colum Westcoast Er Closed						NULL	NULL 7/30/		es No	Release of SL Amine	
		55.03189	9 -123.03117 Not Applicab Not Applicab Not Applicab No		2008 2008/11/26 ( 2008/11/26 ( Damage or d Material Def Job or system Maintenance NULL	NULL	NULL	NULL 7/30/ Employee / C7/27/	/2012 Ye			NULL NULL N
INC2008-113 Release of St 12/1/2008	Chetwynd British Colun Westcoast El Closed		9 -123.03117 Not Applicab Not Applicab Not 2 -121.94446 2 Glycol Miscellaneou No		2008 2008/11/26 2008/11/26 Damage or d Material Def Job or system Maintenance NULL 2008 2008/11/30 2008/11/30 Damage or d Material Def Job or system Standards an NULL			Employee / C7/27/	/2012 Ye	es No	Release of St Amine	
INC2008-113 Release of 5L 12/1/2008 INC2008-114 Release of 5L 12/2/2008	-	55.5692	2 -121.94446 2 Glycol Miscellaneou No			NULL	NULL	Employee / C7/27/	/2012 Ye /2012 Ye /2012 No	o No	Release of SL Amine Fire NULL	NULL NULL N
INC2008-114 Release of St 12/2/2008	-	55.5692 49.68017	2 -121.94446 2 Glycol Miscellaneou No		2008 2008/11/30 2008/11/30 Damage or d Material Def Job or system Standards an NULL	NULL	NULL	Employee / C7/27/ NULL 7/27/	/2012 Ye /2012 Ye /2012 No /2012 Ye	es No o No es No	Release of SL Amine Fire NULL Adverse Envi Glycol	NULL NULL N
INC2008-114 Release of St 12/2/2008 INC2008-115 Fire 12/2/2008	Winnipeg Manitoba TransCanada Closed Charlie Lake British Colum Westcoast Er Closed	55.5692 49.68017 56.63822	2 -121.94446 2 Glycol Miscellaneou No 7 -96.64917 Not Providec Natural Gas No		2008 2008/11/30 2008/11/30 Damage or d Material Def Job or system Standards an NULL 2008 2008/11/28 2008/11/28 Damage or d External Inte Job or system Standards an NULL	NULL NULL NULL	NULL NULL	Employee / ( 7/27/ NULL 7/27/ Employee / ( 7/27/	/2012 Ye /2012 Ye /2012 No /2012 Ye /2015 No	es No o No es No o No	Release of St, Amine Fire NULL Adverse Envi Glycol Release of St, Natural Ga	NULL         NULL         N           2         No         N           Is-         0         No         N           NULL         NULL         NULL         N
INC2008-114 Release of St 12/2/2008 INC2008-115 Fire 12/2/2008	Winnipeg         Manitoba         TransCanada Closed           Charlie Lake         British Colum         Westcoast Er Closed           McLeod Lake British Colum         Westcoast Er Closed	55.5692 49.68017 56.63822 55.032	2         -121.94446         2         Glycol         Miscellaneox         No           7         -96.64917         Not Providec Natural Gas         Gas         No           2         -121.65102         Not Applicab Not Applicab Not Applicab Not Applicab Not 2         -123.03098         Not Providec Natural Gas         Gas         No		2008         2008/11/30         2008/11/30         Damage or d Material Def Job or system Standards an NULL           2008         2008/11/28         2008/11/28         Damage or d External Inte Job or system Standards an NULL           2008         2008/12/02         2008/12/02         Damage or d Equipment F Job or system Maintenance NULL	NULL NULL NULL	NULL NULL NULL	Employee / C 7/27/ NULL 7/27/ Employee / C 7/27/ Employee / C 2/12/	/2012 Ye /2012 Ye /2012 No /2012 Ye /2015 No /2012 Ye	es No o No es No o No es No	Release of SL Amine Fire NULL Adverse Envi Glycol Release of SL Natural Ga Fire NULL	NULL         NULL         N           2         No         N           s -         0         No         N           s -         0         No         N
INC2008-114 Release of 5 12/2/2008 INC2008-115 Fire 12/2/2008 INC2008-115 Release of 5 12/8/2008 INC2008-12C Release of 5 12/9/2008 INC2008-121 Adverse Envi 12/10/2008	Winnipeg         Manitoba         TransCanada Closed           Charlie Lake         British Colum Westcoast Er Closed           McLeod Lake         British Colum Westcoast Er Closed           Winnipeg         Manitoba         TransCanada Closed           Soldboro         Nova Scotia         EnCanad Closed	55.5692 49.68017 56.63822 55.032 49.75544 45.18253	2         -121.94446         2         Glycol         Miscellaneou No           7         -96.64917         Not Providec Natural Gas - Gas         No           2         -121.05102         Not Applicab Not Applicab Not Applicab No         No           2         -123.03098         Not Providec Natural Gas - Gas         No           4         -97.2305         Not Providec Natural Gas - Gas         No           3         -61.65236         Not Applicab Not Applicab Not Applicab Not Applicab No		2008         2008/11/30         2008/11/30         Damage or d         Material Def         Job or system Standards an NULL           2008         2008/11/28         2008/12/28         Damage or d         External Inte         Job or system Standards an NULL           2008         2008/12/02         2008/12/02         Damage or d         Equipment F         Job or system Maintenance NULL           2008         2008/12/05         Damage or d         Material Def         Job or system Maintenance NULL           2008         2008/12/05         2008/12/05         Damage or d         Equipment F         Job or system Maintenance NULL           2008         2008/12/03         2008/12/03         Damage or d         Equipment F         Job or system Maintenance NULL           2008         2008/12/03         2008/12/03         Damage or d         Equipment F         Job or system Maintenance NULL           2008         2008/12/03         2008/12/03         Damage or d         Equipment F         Job or system Maintenance NULL	NULL NULL NULL NULL NULL NULL	NULL NULL NULL NULL NULL NULL	Employee / C 7/27/ NULL 7/27/ Employee / C 7/27/ Employee / C 7/27/ Employee / C 7/27/ Employee / C 1/19/ Employee / C 7/23/	/2012 Ye /2012 Ye /2012 No /2012 Ye /2015 No /2012 Ye /2011 Ye /2011 Ye	es No o No es No es No es No es No	Release of SL Amine Fire NULL Adverse Envi Glycol Release of SL Natural Ga Fire NULL Release of SL Natural Ga Release of SL Natural Ga Adverse Envi NULL	NULL         NULL         N           2         No         N           5         0         No         N           NULL         NULL         NULL         N           5         0         No         N           5         0         No         N           5         0         No         N           5         0         No         N           NULL         NULL         N         NULL
INC2008-114 Release of St 12/2/2008 INC2008-115 Fire 12/2/2008 INC2008-115 Release of St 12/8/2008 INC2008-120 Release of St 12/9/2008 INC2008-121 Adverse Envi 12/10/2008 INC2008-123 Fire 12/17/2008	Winnipeg         Manitoba         TransCanada Closed           Charlie Lake         British Coluri Westcoast Er Closed           McLeod Lake         British Coluri Westcoast Er Closed           Winnipeg         Manitoba           TransCanada Closed         Goldboro           Sodot         Nova Scotia           EnCanad         Closed           Bedmoton         Alberta           Enbridge Pip Closed	55.5692 49.68017 56.63822 55.032 49.75544 45.18253 53.5474	2         -121.94446         2         Glycol         Miscellaneou         No           7         -96.64917         Not Providec Natural Gas         Gas         No           2         -121.65102         Not Applicab Not Applicab Not Applicab Not Applicab         No           2         -123.03098         Not Providec Natural Gas         Gas         No           4         -97.2305         Not Providec Natural Gas         Gas         No           3         -61.65236         Not Applicab Not Applic		2008         2008/11/30         2008/11/30         Damage or d         Material Def         Job or systen Standards an NULL           2008         2008/12/02         2008/12/02         Damage or d         External Inte         Job or systen Standards an NULL           2008         2008/12/02         2008/12/02         Damage or d         Equipment F         Job or systen Maintenance NULL           2008         2008/12/02         2008/12/03         Damage or d         Equipment F         Job or systen Maintenance NULL           2008         2008/12/03         2008/12/08         Damage or d         Equipment F         Job or systen Maintenance NULL           2008         2008/12/03         2008/12/03         Damage or d         Equipment F         Job or systen Maintenance NULL           2008         2008/12/03         2008/12/04         Damage or d         Equipment F         Job or systen Maintenance NULL           2008         2008/12/05         2008/12/08         Damage or d         Equipment F         Job or systen Maintenance NULL           2008         2008/12/04         2008/12/05         Substandard         Operating Cc Job or systen Maintenance NULL	NULL NULL NULL NULL NULL NULL NULL	NULL NULL NULL NULL NULL NULL NULL	Employee / C 7/27/ NULL 7/27/ Employee / C 7/27/ Employee / C 7/27/ Employee / C 7/27/ Employee / C 1/19/ Employee / C 7/23/ Employee / C 7/23/	/2012 Ye /2012 Ye /2012 No /2012 Ye /2015 No /2012 Ye /2011 Ye /2012 Ye /2012 Ye	es No o No es No es No es No es No es No	Release of Si Amine Fire NULL Adverse Envi Glycol Release of Si Natural Ga Fire NULL Release of Si Natural Ga Release of Si Natural Ga Adverse Envi NULL Fire NULL	NULL         NULL         N           2         No         N           NULL         NULL         N           S         0         No         N           S         0         NO         N           S         0         NO         N           NULL         NULL         N         NULL           NULL         NULL         N         NULL
INC2008-114 Release of St 12/2/2008 INC2008-115 Fire 12/2/2008 INC2008-115 Release of St 12/8/2008 INC2008-120 Release of St 12/9/2008 INC2008-121 Adverse Erwi 12/10/2008 INC2008-123 Fire 12/17/2008 INC2008-128 Release of St 1/13/2009	Winnipeg         Manitoba         TransCanada Closed           Charlie Lake         British Colurr         Westcoast Er Closed           McLeod Lake         British Colurr         Westcoast Er Closed           Winnipeg         Manitoba         TransCanada Closed           Goldboro         Nova Scotia         EnCana Corp Closed           B Edmonton         Alberta         Enbridge Pip Closed           Hearst         Ontario         TransCanada Closed	55.5692 49.68017 56.63822 55.032 49.75544 45.18253 53.5474 49.76492	2     -121.94446     2     Glycol     Miscellaneou No       7     -96.64917     Not Providec Natural Gas     Gas     No       2     -121.65102     Not Applicab Not Applicab Not Applicab     Not Applicab     Not Applicab     Not Applicab       2     -123.03098     Not Providec Natural Gas     Gas     No       4     -97.2305     Not Providec Natural Gas     Gas     No       5     -61.65236     Not Applicab Not Applicab Not Applicab     Not Applicab Not Applicab     No       4     -113.35571     Not Applicab Not Applicab Not Applicab     Not Applicab Not Applicab     No       2     -84.91824     Not Providec Natural Gas     Gas     No		2008         2008/11/30         2008/11/30         Damage or d         Material Def         Job or systen Standards an NULL           2008         2008/11/28         2008/12/02         Damage or d         External Inte         Job or systen Standards an NULL           2008         2008/12/02         2008/12/02         Damage or d         Equipment F         Job or systen Maintenance NULL           2008         2008/12/02         2008/12/02         Damage or d         Equipment F         Job or systen Maintenance NULL           2008         2008/12/03         2008/12/03         Damage or d         Equipment F         Job or systen Maintenance NULL           2008         2008/12/03         2008/12/03         Damage or d         Equipment F         Job or systen Maintenance NULL           2008         2008/12/03         2008/12/03         Damage or d         Equipment F         Job or systen Maintenance NULL           2008         2008/12/04         2008/12/04         Domage or d         Equipment F         Job or systen Maintenance NULL           2008         2008/12/05         2008/12/04         Domage or d         Equipment F         Job or systen Maintenance NULL           2008         2008/12/04         2008/12/05         Damage or d         Cracking         Job or systen Engineering i NULL	NULL NULL NULL NULL NULL NULL NULL NULL	NULL NULL NULL NULL NULL NULL NULL NULL	Employee / C 7/27/ NULL 7/27/ Employee / C 7/27/ Employee / C 7/27/ Employee / C 7/27/ Employee / C 1/19/ Employee / C 1/23/ Employee / C 7/27/ Employee / C 7/23/	/2012 Ye /2012 Ye /2012 No /2012 Ye /2015 No /2012 Ye /2011 Ye /2012 Ye /2012 Ye /2012 Ye	No           0         No           05         No	Release of Si Amine       Fire     NULL       Adverse Envi Glycol       Release of Si Natural Ga       Fire     NULL       Release of Si Natural Ga       Adverse Envi NULL       Fire     NULL       Fire     NULL       Fire     NULL       Release of Si Natural Ga       Adverse Envi NULL       Fire     NULL       Release of Si Natural Ga	NULL         NULL         NULL         NULL           2         No         N           5         0         No         N           5         0         No         N           5         0         No         N           NULL         NULL         NUL         N           NULL         NULL         NUL         N           S         0         NO         N           S         0         NO         N           S         0         NO         N
INC2008-114 Release of St 12/2/2008 INC2008-115 Fire 12/2/2008 INC2008-125 Release of St 12/8/2008 INC2008-122 Release of St 12/9/2008 INC2008-122 Fire 12/10/2008 INC2008-123 Fire 12/17/2009 INC2009-022 Release of St 1/13/2009 INC2009-002 Release of St 1/15/2009	Winnipeg         Manitoba         TransCanada Closed           Charlie Lake         British Colum Westcoast Er Closed           McLeod Lake         British Colum Westcoast Er Closed           Winnipeg         Manitoba         TransCanada Closed           Soldboro         Nova Scotia         EnCana Corp Closed           Edmonton         Alberta         Enbridge Pip Closed           Hearst         Ontario         TransCanada Closed           Lincoln         Ontario         TransCanada Closed	55.5692 49.68017 56.63822 49.75544 45.18253 53.5474 49.76492 43.11405	2     -121.94446     2     Glycol     Miscellaneot, No       7     -96.64917     Not Providec, Natural Gas, Gas, Sas, No       2     -121.65102     Not Applicab Not Applicab, Not Applicab, No       2     -121.0308     Not Providec, Natural Gas, Gas, Sas, No       4     -97.2305     Not Providec, Natural Gas, Gas, No       3     -61.65236     Not Applicab, Not Applicab, Not Applicab, No       4     -13.35571     Not Applicab, Not Applicab, Not Applicab, No       5     -79.46307     Not Providec, Natural Gas, Gas, No		2008         2008/11/30         2008/11/30         Damage or d         Material Def         Job or system Standards an NULL           2008         2008/11/26         2008/11/26         Damage or d         External Inte         Job or system Standards an NULL           2008         2008/12/02         2008/12/02         Damage or d         External Inte         Job or system Standards an NULL           2008         2008/12/02         2008/12/05         Damage or d         Equipment F         Job or system Maintenance NULL           2008         2008/12/08         2008/12/08         Damage or d         Equipment F         Job or system Maintenance NULL           2008         2008/12/03         2008/12/03         Damage or d         Equipment F         Job or system Maintenance NULL           2008         2008/12/03         2008/12/03         Damage or d         Equipment F         Job or system Maintenance NULL           2008         2008/12/03         2008/12/03         Substandard         Operating C         Job or system Maintenance NULL           2009         2008/02/04         2008/12/14         Damage or d         Cracking         Job or system Maintenance NULL           2009         2009/01/14         2009/01/14         Damage or d         Cracking         Job or system Maintenance NULL	NULL NULL NULL NULL NULL NULL NULL NULL	NULL NULL NULL NULL NULL NULL NULL NULL	Employee / C7/27/ NULL 7/27/ Employee / C7/27/ Employee / C7/27/ Employee / C7/27/ Employee / C7/27/ Employee / C7/27/ Employee / C7/23/ Employee / C7/23/	/2012         Ye           /2012         Ye           /2012         Ye           /2015         No           /2012         Ye	No           0         No           05         No           0         No           05         No	Release of Si Amine       Fire     NULL       Adverse Envi Glycol       Release of Si, Natural Ga       Fire     NULL       Release of Si, Natural Ga       Adverse Envi NULL       Fire     NULL       Fire     NULL       Release of Si, Natural Ga       Adverse Envi NULL       Fire     NULL       Release of Si, Natural Ga	NULL         NULL         N           2         No         N           5         0         No         N           5         0         NOLL         NULL         N           5         0         No         N         NULL         N           5         0         No         N         NULL         N         NULL         N           NULL         NULL         NULL         N         NULL         N         N         NULL         N         N         N         N         N         N         N         N         N         N         N         N         N         N         N         N         N         N         N         N         N         N         N         N         N         N         N         N         N         N         N         N         N         N         N         N         N         N         N         N         N         N         N         N         N         N         N         N         N         N         N         N         N         N         N         N         N         N         N         N         N         N
NC2008-114 Release of Si         12/2/2008           INC2008-115 Fire         12/2/2008           INC2008-115 Release of Si         12/8/2008           INC2008-120 Release of Si         12/9/2008           INC2008-121 Adverse Envi         12/10/2008           INC2008-122 Fire         12/17/2008           INC2008-128 Release of Si         1/13/2009           INC2009-020 Release of Si         1/13/2009           INC2009-005 Serious Injur         2/9/2009	Winnipeg         Manitoba         TransCanada Closed           Charlie Lake         British Colum Westcoast Er Closed           McLeod Lake         British Colum Westcoast Er Closed           Winnipeg         Manitoba         TransCanada Closed           Soldboro         Nova Scotia         EnCanad Closed           Goldboro         Nova Scotia         EnCana Corp Closed           Edmonton         Alberta         Enbridge Pip Closed           Hearst         Ontario         TransCanada Closed           Lincoln         Ontario         TransCanada Closed           White City         Saskatchewa Enbridge Pip Closed	55.5692 49.68017 56.63822 55.032 49.75544 45.18253 53.5474 49.76492 43.11405 50.44344	2     -121.94446     2     Glycol     Miscellaneou No       7     -96.64917     Not Providec Natural Gas - Gas     No       2     -121.05102     Not Applicab Not Applicab Not Applicab No     No       2     -121.03098     Not Providec Natural Gas - Gas     No       2     -97.2305     Not Providec Natural Gas - Gas     No       3     -61.65236     Not Applicab Not Applicab Not Applicab Not Applicab No       4     -113.35571     Not Applicab Not Applicab Not Applicab No       5     -98.491824     Not Providec Natural Gas - Gas       6     -84.91824     Not Providec Natural Gas - Gas       6     -79.46307     Not Providec Natural Gas - Gas       4     -104.35655     Not Applicab Not Applicab Not Applicab Not Applicab Yes		2008         2008/11/30         2008/11/30         Damage or d         Material Def         Job or systen Standards an NULL           2008         2008/11/28         2008/12/28         Damage or d         External Inte         Job or systen Standards an NULL           2008         2008/12/02         2008/12/02         Damage or d         Equipment F         Job or systen Maintenance NULL           2008         2008/12/05         2008/12/05         Damage or d         Equipment F         Job or systen Maintenance NULL           2008         2008/12/05         2008/12/03         Damage or d         Equipment F         Job or systen Maintenance NULL           2008         2008/12/03         2008/12/03         Damage or d         Equipment F         Job or systen Maintenance NULL           2008         2008/12/03         2008/12/03         Damage or d         Cracking         Job or systen Maintenance NULL           2008         2008/12/14         2008/12/14         Damage or d         Cracking         Job or systen Maintenance NULL           2009         2008/02/04         2008/12/14         Damage or d         Cracking         Job or systen Maintenance NULL           2009         2009/01/14         2008/02/04         Damage or d         Cracking         Job or systen Maintenance NULL	NULL NULL NULL NULL NULL NULL NULL NULL	NULL NULL NULL NULL NULL NULL NULL NULL	Employee / (7/27) NULL 7/27/ Employee / (7/27) Employee / (7/27) Employee / (7/27) Employee / (7/27) Employee / (7/23) Employee / (7/23) Employee / (7/23) Employee / (7/23)	/2012         Ye           /2012         Ye           /2012         Ye           /2012         Ye           /2013         No           /2014         Ye           /2015         No           /2012         Ye	No           0         No           05         No	Release of Si Amine Fire NULL Adverse Envi Glycol Release of Si Natural Ga Fire NULL Release of Si Natural Ga Adverse Envi NULL Fire NULL Release of Si Natural Ga Release of Si Natural Ga Release of Si Natural Ga Serious Injur NULL	NULL         NULL         N           2         No         N           5         0         No         N           NULL         NULL         NUL         N           s-         0         No         N           NULL         NULL         NULL         N           NULL         NULL         N         N           s-         0         No         N           S-         0         NO         N           NULL         NULL         N         N           s-         0         No         N           NULL         NULL         N         N
INC2008-114 Release of St 12/2/2008 INC2008-115 Fire 12/2/2008 INC2008-115 Release of St 12/8/2008 INC2008-122 Release of St 12/9/2008 INC2008-122 Adverse Erwi 12/10/2008 INC2008-123 Fire 12/17/2008 INC2009-002 Release of St 1/13/2009 INC2009-003 Serious Injur 2/9/2009 INC2009-01C Release of St 2/9/2009	Winnipeg         Manitoba         TransCanada Closed           Charlie Lake         British Colum Westcoast Er Closed           McLeod Lake         British Colum Westcoast Er Closed           Winnipeg         Manitoba         TransCanada Closed           Goldboro         Nova Scotia         EnCanad Closed           Goldboro         Nova Scotia         EnCana Corp Closed           Edmonton         Alberta         Enbridge Pip Closed           Hearst         Ontario         TransCanada Closed           Lincoln         Ontario         TransCanada Closed           Lincoln         Ontario         TransCanada Closed	55.5692 49.68017 56.63822 49.75544 45.18253 53.5474 49.76492 43.11405 50.44344 43.11368	2     -121.94446     2     Glycol     Miscellaneou No       7     -96.64917     Not Provideci Natural Gasi Gasi No       2     -121.05102     Not Applicab Not Applicab Not Applicab Not Applicab No       2     -123.03098     Not Provideci Natural Gasi Gasi No       4     -97.2305     Not Provideci Natural Gasi Gasi No       3     -61.65236     Not Applicab Not Applicab Not Applicab Not Applicab No       4     -13.35571     Not Applicab Not Applicab Not Applicab Not Applicab No       2     -84.91824     Not Provideci Natural Gasi Gasi No       5     -79.46307     Not Provideci Natural Gasi Gasi No       4     -104.356555     Not Applicab N		2008         2008/11/30         2008/11/30         Damage or d         Material Def         Job or systen Standards an NULL           2008         2008/12/02         2008/12/02         Damage or d         External Inte         Job or systen Standards an NULL           2008         2008/12/02         2008/12/02         Damage or d         Equipment F         Job or systen Maintenance NULL           2008         2008/12/02         2008/12/05         Damage or d         Equipment F         Job or systen Maintenance NULL           2008         2008/12/03         2008/12/03         Damage or d         Equipment F         Job or systen Maintenance NULL           2008         2008/12/03         2008/12/03         Damage or d         Equipment F         Job or systen Maintenance NULL           2008         2008/12/03         2008/12/04         Damage or d         Equipment F         Job or systen Maintenance NULL           2008         2008/12/04         2008/12/04         Damage or d         Cracking         Job or systen Maintenance NULL           2009         2009/02/04         2009/02/04         Damage or d         Cracking         Job or systen Maintenance NULL           2009         2009/02/04         2009/02/04         Damage or d         Cracking         Job or systen Maintenance NULL           <	NULL NULL NULL NULL NULL NULL NULL NULL	NULL NULL NULL NULL NULL NULL NULL NULL	Employee / C7/27/ NULL 77/27/ Employee / C7/27/ Employee / C7/27/ Employee / C1/27/ Employee / C1/23/ Employee / C7/23/ Employee / C7/23/ Employee / C7/23/ Employee / C1/22/ Employee / C1/22/ Employee / C1/22/	/2012         Ye           /2012         Ye           /2012         No           /2012         Ye	es No o No es No	Release of Si Amine Fire NULL Adverse Envi Glycol Release of Si Natural Ga Fire NULL Release of Si Natural Ga Adverse Envi NULL Fire NULL Release of Si Natural Ga Release of Si Natural Ga Release of Si Natural Ga Serious Injur NULL Release of Si Fuel Gas	NULL         NULL         NULL         NULL           2         No         N           5         0         No         N           S         0         No         N           S         0         No         N           NULL         NULL         NULL         N           NULL         NULL         NULL         N           NULL         NULL         NULL         N           S         0         No         N           S         0         No         N           S         0         No         N           NULL         NULL         NULL         N
INC2008-114 Release of Sc I2/2/2008 INC2008-115 Fire I2/2/2008 INC2008-127 Release of Sc I2/8/2008 INC2008-124 Adverse Erwi I2/10/2008 INC2008-124 Release of Sc I2/17/2008 INC2009-027 Release of Sc I2/15/2009 INC2009-005 Release of Sc I2/9/2009 INC2009-016 Release of Sc I2/9/2009 INC2009-015 Serious Injur I2/20/2009	Winnipeg         Manitoba         TransCanada Closed           Charlie Lake         British Colum Westcoast Er Closed           McLeod Lake         British Colum Westcoast Er Closed           Winnipeg         Manitoba         TransCanada Closed           Goldboro         Nova Scotia         EnCana Corp Closed           Goldboro         Nova Scotia         EnCana Corp Closed           Edmonton         Alberta         Enbridge Pip Closed           Hearst         Ontario         TransCanada Closed           Lincoln         Ontario         TransCanada Closed           Lincoln         Ontario         TransCanada Closed           Lincoln         Ontario         TransCanada Closed           Wonowon         British Colum Westcoast Er Closed	55.5692 49.68017 56.63822 55.032 49.75544 49.75544 49.7544 49.76492 43.11405 50.44344 43.11405 50.44344	2     -121.94446     2     Glycol     Miscellaneot, No       7     -96.64917     Not Providec Natural Gas - Gas     No       2     -121.65102     Not Applicab Not Applicab Not Applicab Not Applicab     No       2     -123.03098     Not Providec Natural Gas - Gas     No       4     -97.2305     Not Providec Natural Gas - Gas     No       3     -61.65236     Not Applicab Not App		2008         2008/11/30         2008/11/30         Damage or d         Material Def         Job or systen Standards an NULL           2008         2008/12/02         2008/12/02         Damage or d         External Inte         Job or systen Standards an NULL           2008         2008/12/02         2008/12/02         Damage or d         External Inte         Job or systen Standards an NULL           2008         2008/12/02         2008/12/02         Damage or d         Equipment F         Job or systen Maintenance NULL           2008         2008/12/03         2008/12/03         Damage or d         Equipment F         Job or systen Maintenance NULL           2008         2008/12/03         2008/12/03         Damage or d         Equipment F         Job or systen Maintenance NULL           2008         2008/12/04         2008/12/05         Damage or d         Cracking         Job or systen Maintenance NULL           2009         2009/02/04         2008/12/14         Damage or d         Cracking         Job or systen Maintenance NULL           2009         2009/02/04         2009/02/06         Damage or d         Cracking         Job or systen Maintenance NULL           2009         2009/02/06         2009/02/06         Damage or d         Cracking         Job or systen Maintenance NULL           <	NULL NULL NULL NULL NULL NULL NULL NULL	NULL NULL NULL NULL NULL NULL NULL NULL	Employee / C 7/27/ NULL 7/27/ Employee / C 7/23/ Employee / C 7/23/ Employee / C 7/23/ Employee / C 7/22/ Employee / C 7/22/ Employee / C 7/22/	/2012         Ye	No           o         No           cs         No	Release of SL Amine       Fire     NULL       Adverse Envi Giycol       Release of SL Natural Ga       Fire     NULL       Release of SL Natural Ga       Adverse Envi NULL       Fire     NULL       Release of SL Natural Ga       Adverse Envi NULL       Fire     NULL       Release of SL Natural Ga       Serious Injur NULL       Release of SL Natural Ga       Release of SL Natural Ga	NULL         NULL         NULL           2         No         N           5         0         No         N           S         0         No         N           NULL         NULL         N         N           S         0         No         N           NULL         NULL         N         N           NULL         NULL         NULL         N           S         0         No         N           S         0         No         N           NULL         NULL         NULL         N           S         0         No         N           NULL         NULL         N         N           S         0         No         N           S         0.0001         N         N
INC2008-114 Release of Si 12/2/2008 INC2008-115 Fire 12/2/2008 INC2008-115 Release of Si 12/8/2008 INC2008-120 Release of Si 12/9/2008 INC2008-121 Adverse Envi 12/10/2008 INC2008-123 Fire 12/17/2009 INC2009-002 Release of Si 17/5/2009 INC2009-002 Serious Injur 2/9/2009 INC2009-012 Release of Si 2/9/2009 INC2009-015 Release of Si 3/5/2009 INC2009-015 Release of Si 3/5/2009	Winnipeg         Manitoba         TransCanada Closed           Charlie Lake         British Colum Westcoast Er Closed           McLeod Lake         British Colum Westcoast Er Closed           Winnipeg         Manitoba         TransCanada Closed           Boldboro         Nova Scotia         EnCanada Closed           Boldboro         Nova Scotia         EnCana Corp Closed           Boldboro         Alberta         Enbridge Pip Closed           Hearst         Ontario         TransCanada Closed           Lincoln         Ontario         TransCanada Closed           Lincoln         Ontario         TransCanada Closed           White City         Saskatchewa Enbridge Pip Closed         Lincoln           Wonowon         British Colum Westcoast Er Closed         Portage La Pi Manitoba	55.5692 49.68017 56.63822 55.032 49.75544 45.8253 53.5474 49.76492 43.11405 50.44344 43.11405 50.44344 43.11368 56.22686 49.91175	2     -121.94446     2     Glycol     Miscellaneot, No       7     -96.64917     Not Providec, Natural Gas, Gas, No       2     -121.65102     Not Applicab, Not Applicab, Not Applicab, No       2     -121.0308     Not Providec, Natural Gas, Gas, No       4     -97.2305     Not Providec, Natural Gas, Gas, No       3     -61.65236     Not Applicab, Not, Appl		2008         2008/11/30         2008/11/30         Damage or d         Material Def         Job or system Standards an NULL           2008         2008/11/26         2008/11/26         Damage or d         External Inte         Job or system Standards an NULL           2008         2008/12/02         2008/12/02         Damage or d         External Inte         Job or system Standards an NULL           2008         2008/12/05         2008/12/05         Damage or d         Equipment F         Job or system Maintenance NULL           2008         2008/12/08         2008/12/08         Damage or d         Equipment F         Job or system Maintenance NULL           2008         2008/12/03         2008/12/03         Damage or d         Equipment F         Job or system Maintenance NULL           2008         2008/12/04         2008/12/05         Substandard         Operating C         Job or system Maintenance NULL           2009         2008/02/04         2008/12/14         Damage or d         Cracking         Job or system Maintenance NULL           2009         2009/02/04         2008/12/14         Damage or d         Cracking         Job or system Maintenance NULL           2009         2009/02/04         2009/02/09         Damage or d         Gracking         Job or system Maintenance NULL	NULL NULL NULL NULL NULL NULL NULL NULL	NULL NULL NULL NULL NULL NULL NULL NULL	Employee / C7/27/ NULL 7/27/ Employee / C7/27/ Employee / C7/27/ Employee / C7/27/ Employee / C7/27/ Employee / C7/23/ Employee / C7/23/ Employee / C1/22/ Employee / C7/23/ Employee / C7/23/ Employee / C7/23/ Employee / C7/23/	/2012         Ye	No           0         No           0         No           0         No           05         No           05         No           05         No           05         No           05         No           00         No           01         No           02         No           03         No           04         No           05         No	Release of Si, Amine       Fire     NULL       Adverse Envi Glycol       Release of Si, Natural Ga       Fire     NULL       Release of Si, Natural Ga       Adverse Envi NULL       Fire     NULL       Fire     NULL       Release of Si, Natural Ga       Adverse Envi NULL       Fire     NULL       Release of Si, Natural Ga       Release of Si, Natural Ga       Serious Injur NULL       Release of Si, Natural Ga	NULL         NULL         NULL         NULL           2         No         N           5         0         NO         N           5         0         NO         N           5         0         NO         N           5         0         NO         N           NULL         NULL         NULL         N           NULL         NULL         NULL         N           5         0         NO         N           5         0         NO         N           6         0         NO         N           6         0         NO         N           6         0.0001         N         N           5         0.0001         N         N
INC2008-114 Release of Si         12/2/2008           INC2008-115 Fire         12/2/2008           INC2008-125 Fire         12/8/2008           INC2008-126 Release of Si         12/9/2008           INC2008-127 Adverse Envi         12/10/2008           INC2008-128 Fire         12/17/2008           INC2008-128 Fire         12/17/2008           INC2008-028 Release of Si         1/13/2009           INC2009-002 Release of Si         2/9/2009           INC2009-015 Release of Si         2/9/2009           INC2009-015 Release of Si         3/10/2009           INC2009-012 Release of Si         3/10/2009	Winnipeg         Manitoba         TransCanada Closed           Charlie Lake         British Colun Westcoast E Closed           McLeod Lake         British Colun Westcoast E Closed           Winnipeg         Manitoba         TransCanada Closed           Soldboro         Nova Scotia         EnCana Corp Closed           Goldboro         Alberta         Enbridge Pip Closed           Hearst         Ontario         TransCanada Closed           Unito         Ontario         TransCanada Closed           White City         Saskatchewa         Enbridge Pip Closed           Lincoln         Ontario         TransCanada Closed           Wonowon         British Colun Westcoast E Closed         Wonowon           Portage La Pi Manitoba         TransCanada Closed         Closed           Potter         Ontario         TransCanada Closed         Closed	55.5692 49.68017 56.63822 55.032 49.75544 45.18253 53.5474 49.76492 43.11405 50.44344 43.11368 56.72686 49.91175 48.87172	2     -121.94446     2     Glycol     Miscellaneou No       7     -96.64917     Not Providec Natural Gas - Gas     No       2     -121.05102     Not Applicab Not Applicab Not Applicab Not 2     -123.03098       2     -121.03098     Not Providec Natural Gas - Gas     No       4     -97.2305     Not Providec Natural Gas - Gas     No       3     -61.65236     Not Applicab Not Applicab Not Applicab Not Applicab No       4     -113.35571     Not Applicab Not Applicab Not Applicab No       5     -84.91824     Not Providec Natural Gas - Gas     No       6     -84.91824     Not Providec Natural Gas - Gas     No       6     -79.46307     Not Providec Natural Gas - Gas     No       6     -79.46307     Not Providec Fuel Gas     Gas     No       6     -79.45307     Not Providec Fuel Gas     Gas     No       6     -121.81832     0.0001     Natural Gas - Gas     Yes       8     -98.51757     2.5     Lucpid     No       2     -88.9396     Not Providec Natural Gas - Gas     No		2008         2008/11/30         2008/11/30         Damage or d         Material Def         Job or systen Standards an NULL           2008         2008/11/32         2008/11/32         Damage or d         External Inte         Job or systen Standards an NULL           2008         2008/12/02         2008/12/02         Damage or d         External Inte         Job or systen Standards an NULL           2008         2008/12/03         2008/12/02         Damage or d         Equipment F         Job or systen Maintenance NULL           2008         2008/12/03         2008/12/03         Damage or d         Equipment F         Job or systen Maintenance NULL           2008         2008/12/03         2008/12/03         Damage or d         Equipment F         Job or systen Maintenance NULL           2008         2008/12/04         2008/12/04         Damage or d         Cracking         Job or systen Maintenance NULL           2009         2008/02/04         2008/12/14         Damage or d         Cracking         Job or systen Maintenance NULL           2009         2009/02/04         2009/02/09         Damage or d         Material Def         Job or systen Maintenance NULL           2009         2009/02/06         2009/02/06         Damage or d         Material Def         Job or systen Maintenance NULL	NULL NULL NULL NULL NULL NULL NULL NULL	NULL NULL NULL NULL NULL NULL NULL NULL	Employee / C 7/27/ NULL 7/27/ Employee / C 7/23/ Employee / C 7/23/	/2012         Yee           /2012         Yee           /2012         No           /2012         Yee           /2013         Yee           /2014         Yee           /2012         Yee	No           0         No	Release of Si Amine Fire NULL Adverse Envi Giycol Release of Si Natural Ga Fire NULL Release of Si Natural Ga Release of Si Natural Ga Adverse Envi NULL Fire NULL Release of Si Natural Ga Release of Si Natural Ga Serious Injur NULL Release of Si Natural Ga Release of Si Natural Ga Release of Si Natural Ga	NULL         NULL         NULL           2         No         N           2         No         N           5         0         No         N           S         0         No         N           S         0         No         N           NULL         NULL         NULL         N           NULL         NULL         NULL         N           S         0         No         N           S         0         No         N           S         0         No         N           S         0.0001         NO         N           2.5         NO         N         N           S         0.0001         NO         N           3.5         0         NO         N
INC2008-114 Release of St         12/2/2008           INC2008-115 Fire         12/2/2008           INC2008-125 Release of St         12/8/2008           INC2008-122 Release of St         12/8/2008           INC2008-122 Release of St         12/10/2008           INC2008-122 Release of St         1/13/2009           INC2008-122 Fire         12/17/2008           INC2009-005 Release of St         1/13/2009           INC2009-005 Serious Injur         2/9/2009           INC2009-015 Release of St         2/9/2009           INC2009-015 Release of St         3/5/2009           INC2009-024 Release of St         3/10/2009           INC2009-024 Release of St         3/10/2009           INC2009-024 Serious Injur         3/13/2009	Winnipeg         Manitoba         TransCanada Closed           Charlie Lake         British Colun Westcoast Er Closed           McLeod Lake         British Colun Westcoast Er Closed           Winnipeg         Manitoba         TransCanada Closed           Boldboro         Nova Scotia         EnCana Corp Closed           Boldboro         Nova Scotia         Enbridge Pip Closed           Hearst         Ontario         TransCanada Closed           Uncoln         Ontario         TransCanada Closed           White City         Saskatchewa Enbridge Pip Closed         Lincoln           Untario         TransCanada Closed         Worwown           Portage La Pi Manitoba         TransCanada Closed         Portage La Closed           Portage La Ontario         TransCanada Closed         Closed           Portage La Ontario         TransCanada Closed         Sarnia	55.5692 49.68027 56.63822 49.75544 45.18253 53.5474 49.76492 43.11405 50.44344 43.11368 56.72686 49.91175 48.87172 42.97494	2     -121.94446     2     Glycol     Miscellaneou No       7     -96.64917     Not Providec Natural Gas - Gas     No       2     -121.05102     Not Applicab Not Applicab Not Applicab Not Applicab No     No       2     -121.03098     Not Providec Natural Gas - Gas     No       3     -61.65236     Not Applicab Not Applicab Not Applicab Not Applicab No     No       4     -113.35571     Not Applicab Not Applicab Not Applicab No     Applicab No       5     -79.46307     Not Providec Natural Gas - Gas     No       5     -79.46307     Not Providec Natural Gas - Gas     No       4     -104.35655     Not Applicab Not Appli		2008         2008/11/30         2008/11/30         Damage or d Material Def         Job or systen Standards an NULL           2008         2008/12/02         2008/12/02         Damage or d External Inte         Job or systen Standards an NULL           2008         2008/12/02         2008/12/02         Damage or d Equipment F         Job or systen Maintenance NULL           2008         2008/12/02         2008/12/05         Damage or d Equipment F         Job or systen Maintenance NULL           2008         2008/12/03         2008/12/03         Damage or d Equipment F         Job or systen Maintenance NULL           2008         2008/12/03         2008/12/03         Damage or d Cracking         Job or systen Maintenance NULL           2008         2008/12/03         2008/12/03         Damage or d Cracking         Job or systen Maintenance NULL           2009         2008/02/04         2008/12/04         Damage or d Cracking         Job or systen Maintenance NULL           2009         2009/02/04         2009/02/04         Damage or d Incorrect Op         Job or systen Maintenance NULL           2009         2009/02/06         2009/02/06         Damage or d Incorrect Op         Job or systen Maintenance NULL           2009         2009/02/02         2009/02/04         Damage or d Incorrect Op         Job or systen Maintenance NULL	NULL NULL NULL NULL NULL NULL NULL NULL	NULL NULL NULL NULL NULL NULL NULL NULL	Employee / C 7/27/ NULL 7/27/ Employee / C 7/27/ Employee / C 7/27/ Employee / C 1/12/ Employee / C 1/27/ Employee / C 7/23/ Employee / C 7/23/ Employee / C 7/23/ Employee / C 7/23/ Employee ( C 7/27/ Employee ( C 7/27)	/2012         Ye           /2012         Ye           /2012         No           /2012         Ye           /2013         No           /2014         Ye           /2015         No           /2012         Ye	NO           0         No	Release of Si Amine Fire NULL Adverse Envi Glycol Release of Si Natural Ga Fire NULL Release of Si Natural Ga Release of Si Natural Ga Adverse Envi NULL Fire NULL Release of Si Natural Ga Release of Si Natural Ga	NULL         NULL         NULL         N           2         No         N           5         0         No         N           5         0         No         N           5         0         No         N           8         0         No         N           NULL         NULL         N         N           S         0         No         N           S         0         No         N           S         0         No         N           NULL         NULL         NUL         N           0         0.0001         No         N           1         0.0001         No         N           1         2.5         No         N           1         0         NULL         N
INC2008-114 Release of St         12/2/2008           INC2008-115 Fire         12/2/2008           INC2008-125 Release of St         12/8/2008           INC2008-126 Release of St         12/9/2008           INC2008-127 Adverse Erwi         12/10/2008           INC2008-128 Fire         12/10/2008           INC2008-128 Release of St         1/13/2009           INC2009-002 Release of St         1/15/2009           INC2009-015 Serious Injur         2/9/2009           INC2009-015 Release of St         3/5/2009           INC2009-027 Release of St         3/10/2009           INC2009-024 Serious Injur         2/3/2009           INC2009-024 Serious Injur         3/13/2009	Winnipeg         Manitoba         TransCanada Closed           Charlie Lake         British Colum Westcoast Er Closed           McLeo Lake         British Colum Westcoast Er Closed           Winnipeg         Manitoba         TransCanada Closed           Goldboro         Nova Scotia         EnCanad           Goldboro         Nova Scotia         EnCanad           Bedmotton         Alberta         Enbridge Pip Closed           Hearst         Ontario         TransCanada Closed           Unicolin         Ontario         TransCanada Closed           White City         Saskatchewa         Enbridge Pip Closed           Lincoln         Ontario         TransCanada Closed           Wonowon         British Colum Westcoast Er Closed           Portage La Pi Manitoba         TransCanada Closed           Potter         Ontario         TransCanada Closed           Sarnia         Ontario         TransCanada Closed           Sarnia         Ontario         TransCanada Closed           Notarjoe         Enbridge Pip Closed           Notarjoe         Enbridge Pip Closed	55.5692 49.68017 56.63822 55.032 49.75544 49.75544 49.76492 43.11405 50.4434 43.11368 56.72686 49.91175 48.87172 42.97494 57.31724	2     -121.94446     2     Glycol     Miscellaneot, No       7     -96.64917     Not Providec Natural Gas - Gas     No       2     -121.65102     Not Applicab Not Applicab Not Applicab     No       2     -121.03098     Not Providec Natural Gas - Gas     No       4     -97.2305     Not Providec Natural Gas - Gas     No       3     -61.65236     Not Applicab Not Applicab Not Applicab     Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not Applicab Not App		2008         2008/11/30         2008/11/30         Damage or d         Material Def         Job or systen Standards an NULL           2008         2008/12/02         2008/12/02         Damage or d         External Inte         Job or systen Standards an NULL           2008         2008/12/02         2008/12/02         Damage or d         External Inte         Job or systen Standards an NULL           2008         2008/12/02         2008/12/02         Damage or d         Equipment F         Job or systen Maintenance NULL           2008         2008/12/03         2008/12/03         Damage or d         Equipment F         Job or systen Maintenance NULL           2008         2008/12/03         2008/12/05         Damage or d         Cracking         Job or systen Maintenance NULL           2009         2008/12/04         2008/12/05         Damage or d         Cracking         Job or systen Maintenance NULL           2009         2009/02/04         2009/02/04         Damage or d         Cracking         Job or systen Maintenance NULL           2009         2009/02/05         2009/02/06         Damage or d         Faujment F         Personal fact Individual Fa NULL           2009         2009/02/05         2009/02/06         Damage or d         Material Def         Job or systen Maintenance NULL	NULL NULL NULL NULL NULL NULL NULL NULL	NULL NULL NULL NULL NULL NULL NULL NULL	Employee / C 7/27/ NULL 7/27/ Employee / C 7/23/ Employee / C 7/27/ Employee / C 7/27/ Employee / C 7/27/	2012         Ye           2012         Ye           2012         No           2011         Ye           2012         Ye           2011         Ye           2012         Ye           2011         Ye           2012         Ye	No           0         No           25         No	Release of Si Amine       Fire     NULL       Adverse Envi Giycol       Release of Si Natural Ga       Fire     NULL       Release of Si Natural Ga       Adverse Envi NULL       Fire     NULL       Fire     NULL       Fire     NULL       Fire     NULL       Release of Si Natural Ga       Release of Si Natural Ga       Serious Injur NULL       Release of Si Natural Ga       Serious Injur NULL       Release of Si Natural Ga	NULL         NULL         NULL         NULL           2         No         N           5         0         No         N           S         0         No         N           S         0         No         N           NULL         NULL         N         N           NULL         NULL         NULL         N           NULL         NULL         NULL         N           S         0         No         N           NULL         NULL         N         N           S         0         No         N           S         0         No         N           S         0.0001         No         N           S         0         No         N           S         0         No         N           S         0         NO         N
INC2008-114 Release of Si         12/2/2008           INC2008-115 Fire         12/2/2008           INC2008-115 Release of Si         12/8/2008           INC2008-120 Release of Si         12/9/2008           INC2008-121 Adverse Envi         12/10/2008           INC2008-122 Release of Si         12/11/2008           INC2008-123 Fire         12/11/2008           INC2008-024 Release of Si         1/13/2009           INC2009-005 Serious Injur         2/9/2009           INC2009-015 Release of Si         2/9/2009           INC2009-015 Release of Si         3/1/2009           INC2009-024 Release of Si         3/1/2009           INC2009-024 Release of Si         3/1/2009           INC2009-024 Release of Si         3/13/2009           INC2009-025 Release of Si         3/13/2009           INC2009-026 Release of Si         3/2/3/2009	Winnipeg         Manitoba         TransCanada Closed           Charlie Lake         British Colum Westcoast Er Closed           McLeod Lake         British Colum Westcoast Er Closed           Winnipeg         Manitoba         TransCanada Closed           Goldboro         Nova Scotia         EnCana Corp Closed           Goldboro         Nova Scotia         EnCana Corp Closed           Goldboro         Nova Scotia         EnCana Corp Closed           Hearst         Ontario         TransCanada Closed           Lincoln         Ontario         TransCanada Closed           White City         Saskatchewa         Enbridge Pip Closed           Lincoln         Ontario         TransCanada Closed           Wonowon         British Colum Westcoast Er Closed         Portage La Pi Manitoba           Portage La Pi Manitoba         TransCanada Closed         Sarnia           Ontario         TransCanada Closed         Sarnia         Ontario           Not specified British Colum Westcoast Er Closed         Sarnia         Ontario           Tumbler Ridg British Colum Westcoast Er Closed         Tumbler Ridg British Colum Westcoast Er Closed	55.5692 49.68017 56.63822 55.032 49.75544 45.8253 53.5474 49.76492 43.11405 50.44344 43.11405 50.44344 43.11368 56.72686 49.91175 48.87122 42.97494 57.31724 54.97941	2     -121.94446     2     Glycol     Miscellaneot, No       7     -96.64917     Not Providec, Natural Gas, Gas, No       2     -121.65102     Not Applicab, Not Applicab, Not Applicab, No       2     -121.03088     Not Providec, Natural Gas, Gas, No       4     -97.2305     Not Providec, Natural Gas, Gas, No       3     -61.65236     Not Applicab, N		2008         2008/11/30         2008/11/30         Damage or d         Material Def         Job or system Standards an NULL           2008         2008/11/26         2008/11/26         Damage or d         External Inte         Job or system Standards an NULL           2008         2008/12/02         2008/12/02         Damage or d         External Inte         Job or system Standards an NULL           2008         2008/12/05         2008/12/05         Damage or d         Equipment F         Job or system Maintenance NULL           2008         2008/12/08         2008/12/08         Damage or d         Equipment F         Job or system Maintenance NULL           2008         2008/12/03         2008/12/05         Substandard         Operating C         Job or system Maintenance NULL           2008         2008/12/04         2008/12/14         Damage or d         Cracking         Job or system Maintenance NULL           2009         2009/02/04         2008/12/14         Damage or d         Cracking         Job or system Maintenance NULL           2009         2009/02/04         2009/02/04         Damage or d         Gracking         Job or system Maintenance NULL           2009         2009/02/04         2009/02/04         Damage or d         Material Def         Job or system Maintenance NULL	NULL NULL NULL NULL NULL NULL NULL NULL	NULL NULL NULL NULL NULL NULL NULL NULL	Employee / C 7/27/ NULL 7/27/ Employee / C 7/23/ Employee / C 7/23/ Employee / C 7/23/ Employee / C 7/23/ Employee / C 7/27/ Employee / C 7/27/	/2012         Ye           /2013         Ye	No           0         No           0         No           0         No           05         No	Release of SL Amine Fire NULL Adverse Envi Glycol Release of SL Natural Ga Fire NULL Release of SL Natural Ga Adverse Envi NULL Fire NULL Release of SL Natural Ga Serious Injur NULL Release of SL Natural Ga Release of SL Natural Ga Release of SL Natural Ga Release of SL Natural Ga Release of SL Natural Ga Serious Injur NULL Release of SL Natural Ga Serious Injur NULL	NULL         NULL         NULL         NULL           2         No         N           5         0         NO         N           NULL         NULL         NULL         N           5         0         NO         N           5         0         NO         N           6         0.0001         N         N           5         0         NO         N           5         0         NO         N           5         0         NO         N           5         0         NO         N
INC2008-114 Release of Si INC2008-115 Fire 12/2/2008 INC2008-115 Fire 12/2/2008 INC2008-125 Release of Si INC2008-122 Release of Si INC2008-122 Release of Si INC2008-122 Release of Si INC2009-005 Release of Si INC2009-005 Serious Injur INC2009-015 Release of Si INC2009-015 Release of Si INC2009-015 Release of Si INC2009-015 Release of Si INC2009-021 Release of Si INC2009-023 Release of Si INC2009-023 Release of Si INC2009-023 Release of Si INC2009-032 Rele	Winnipeg         Manitoba         TransCanada Closed           Charlie Lake         British Colun Westcoast Er Closed           McLeod Lake         British Colun Westcoast Er Closed           Winnipeg         Manitoba         TransCanada Closed           Boldboro         Nova Scotia         EnCana Corp Closed           Bodoton         Alberta         Enbridge Pip Closed           Bodoton         Ontario         TransCanada Closed           Unicoln         Ontario         TransCanada Closed           Unicoln         Ontario         TransCanada Closed           White City         Saskatchewa         Enbridge Pip Closed           Lincoln         Ontario         TransCanada Closed           Vonowon         British Colun         Westcoast Er Closed           Portage La Pi Manitoba         TransCanada Closed         Sarnia           Potage La Pi Manitoba         TransCanada Closed         Sarnia           Not specifiec         British Colun         Westcoast Er Closed           Not specifiec         British Colun         Westcoast Er Closed           Tumbler Ridg British Colun         TransCanada Closed         Closed	55.5692 49.68017 56.63822 55.032 49.75544 49.75544 49.76492 43.11405 50.44344 43.11368 56.72686 49.91175 48.87172 48.87172 42.97494 57.31724 54.97941	2     -121.94446     2     Glycol     Miscellaneou No       7     -96.64937     Not Providec Natural Gas - Gas     No       2     -121.65102     Not Applicab Not Applicab Not Applicab Not Applicab Not     No       2     -121.03098     Not Providec Natural Gas - Gas     No       4     -97.2305     Not Providec Natural Gas - Gas     No       3     -61.65236     Not Applicab Not Applicab Not Applicab Not Applicab No       4     -113.35571     Not Applicab Not Applicab Not Applicab Not Applicab No       5     -79.46307     Not Providec Natural Gas - Gas     No       6     -124.35655     Not Applicab Not Applicab Not Applicab Not Applicab No     So       6     -121.81832     0.0001     Natural Gas - Gas     No       6     -121.81832     0.0001     Natural Gas - Gas     No       2     -80.89396     Not Providec Natural Gas - Gas     No       2     -80.89396     Not Providec Natural Gas - Gas     No       2     -80.89396     Not Providec Natural Gas - Gas     No       2     -82.40703     Not Applicab Not Appl		2008         2008/11/30         2008/11/30         Damage or d         Material Def         Job or systen Standards an NULL           2008         2008/11/28         2008/11/28         Damage or d         External Inte         Job or systen Standards an NULL           2008         2008/12/02         2008/12/02         Damage or d         External Inte         Job or systen Standards an NULL           2008         2008/12/05         2008/12/05         Damage or d         Equipment F         Job or systen Maintenance NULL           2008         2008/12/03         2008/12/03         Damage or d         Equipment F         Job or systen Maintenance NULL           2008         2008/12/03         2008/12/03         Damage or d         Equipment F         Job or systen Maintenance NULL           2008         2008/12/04         2008/12/04         Damage or d         Cracking         Job or systen Maintenance NULL           2009         2008/02/04         2008/02/04         Damage or d         Material Def         Job or systen Maintenance NULL           2009         2009/02/04         2009/02/04         Damage or d         Material Def         Job or systen Maintenance NULL           2009         2009/02/05         Damage or d         Material Def         Job or systen Maintenance NULL           2009	NULL NULL NULL NULL NULL NULL NULL NULL	NULL NULL NULL NULL NULL NULL NULL NULL	Employee / C7/27/ NULL 77/27/ Employee / C7/27/ Employee / C7/27/ Employee / C1/12/ Employee / C1/12/ Employee / C7/23/ Employee / C1/22/ Employee / C1/22/ Employee / C1/22/ Employee / C1/22/ Employee / C1/22/ Employee / C1/24/ Employee / C1/24/	2012         Ye           2012         Ye           2012         Ye           2013         Nd           2014         Ye           2015         Nd           2012         Ye           2013         Ye	NO           0         No	Release of Si, Amine NULL Adverse Envi Giycol Release of Si, Natural Ga Fire NULL Release of Si, Natural Ga Release of Si, Natural Ga Adverse Envi NULL Fire NULL Release of Si, Natural Ga Release of Si, Natural Ga Serious Injur NULL Release of Si, Natural Ga Release of Si, Natural Ga Serious Injur NULL Release of Si, Natural Ga Serious Injur NULL Release of Si, Natural Ga Serious Injur NULL	NULL         NULL         NULL         NULL           2         No         N           S         0         No         N           S         0         No         N           S         0         No         N           S         0         No         N           NULL         NULL         NULL         N           S         0         No         N
INC2008-114 Release of Si INC2008-115 Fire INC2008-115 Fire INC2008-115 Release of Si I2/2/2008 INC2008-12C Release of Si I2/3/2008 INC2008-122 Adverse Erw I2/17/2008 INC2008-123 Fire I2/17/2008 INC2009-005 Release of Si I/13/2009 INC2009-015 Release of Si I/13/2009 INC2009-015 Release of Si I/2/2009 INC2009-015 Release of Si I/2/2009 INC2009-015 Release of Si I/3/2009 INC2009-021 Release of Si I/2/2009 INC2009-021 Release of Si I/2/2009 INC2009-031 Release of Si I/2/2009 INC2009-034 Release of Si I/2/2009 INC2009-034 Release of Si I/2/2009	Winnipeg         Manitoba         TransCanada Closed           Charlie Lake         British Colun Westcoast Er Closed           McLeod Lake         British Colun Westcoast Er Closed           Winnipeg         Manitoba         TransCanada Closed           Boldboro         Nova Scotia         EnCana Corp Closed           Bodoton         Alberta         Enbridge Pip Closed           Bodoton         Ontario         TransCanada Closed           Unicoln         Ontario         TransCanada Closed           Unicoln         Ontario         TransCanada Closed           White City         Saskatchewa         Enbridge Pip Closed           Lincoln         Ontario         TransCanada Closed           Vonowon         British Colun         Westcoast Er Closed           Portage La Pi Manitoba         TransCanada Closed         Sarnia           Potage La Pi Manitoba         TransCanada Closed         Sarnia           Not specifiec         British Colun         Westcoast Er Closed           Not specifiec         British Colun         Westcoast Er Closed           Tumbler Ridg British Colun         TransCanada Closed         Closed	55.5692 49.68017 56.63822 55.032 49.75544 49.76542 49.76492 43.11405 50.44344 43.11368 56.72686 49.91175 48.87172 42.97494 57.31724 54.97941 49.58574 43.35064	2     -121.94446     2     Glycol     Miscellaneou No       7     -96.64937     Not Providec Natural Gas - Gas     No       2     -121.65102     Not Applicab Not Applicab Not Applicab Not Applicab Not     No       2     -121.03098     Not Providec Natural Gas - Gas     No       4     -97.2305     Not Providec Natural Gas - Gas     No       3     -61.65236     Not Applicab Not Applicab Not Applicab Not Applicab No       4     -113.35571     Not Applicab Not Applicab Not Applicab Not Applicab No       5     -79.46307     Not Providec Natural Gas - Gas     No       6     -124.35655     Not Applicab Not Applicab Not Applicab Not Applicab No     So       6     -121.81832     0.0001     Natural Gas - Gas     No       6     -121.81832     0.0001     Natural Gas - Gas     No       2     -80.89396     Not Providec Natural Gas - Gas     No       2     -80.89396     Not Providec Natural Gas - Gas     No       2     -80.89396     Not Providec Natural Gas - Gas     No       2     -82.40703     Not Applicab Not Appl		2008         2008/11/30         2008/11/30         Damage or d         Material Def         Job or systen Standards an NULL           2008         2008/11/28         2008/11/28         Damage or d         External Inte         Job or systen Standards an NULL           2008         2008/12/02         2008/12/05         Damage or d         External Inte         Job or systen Standards an NULL           2008         2008/12/05         2008/12/05         Damage or d         Equipment F         Job or systen Maintenance NULL           2008         2008/12/03         2008/12/03         Damage or d         Equipment F         Job or systen Maintenance NULL           2008         2008/12/03         2008/12/03         Damage or d         Equipment F         Job or systen Maintenance NULL           2009         2008/02/04         2008/12/04         Damage or d         Cracking         Job or systen Maintenance NULL           2009         2008/02/04         2008/02/04         Damage or d         Material Def         Job or systen Maintenance NULL           2009         2009/02/04         2009/02/04         Damage or d         Material Def         Job or systen Maintenance NULL           2009         2009/02/04         2009/02/04         Damage or d         Material Def         Job or systen Maintenance NULL <t< td=""><td>NULL NULL NULL NULL NULL NULL NULL NULL</td><td>NULL NULL NULL NULL NULL NULL NULL NULL</td><td>Employee / C 7/27/ NULL 7/27/ Employee / C 7/27/ Employee / C 7/27/ Employee / C 1/12/ Employee / C 1/27/ Employee / C 7/23/ Employee / C 1/27/ Employee / C 1/24/ Employee / C 1/24/ Employee / C 1/24/ Employee / C 1/24/</td><td>2012         Ye           2012         Ye           2012         Ye           2013         Nd           2014         Ye           2015         Nd           2012         Ye           2013         Ye</td><td>NO           0         No           0</td><td>Release of SL Amine Fire NULL Adverse Envi Glycol Release of SL Natural Ga Fire NULL Release of SL Natural Ga Adverse Envi NULL Fire NULL Fire NULL Release of SL Natural Ga Serious Injur NULL Release of SL Natural Ga Release of SL 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Nd           2014         Ye           2015         Nd           2012         Ye           2013         Ye	NO           0         No           0	Release of SL Amine Fire NULL Adverse Envi Glycol Release of SL Natural Ga Fire NULL Release of SL Natural Ga Adverse Envi NULL Fire NULL Fire NULL Release of SL Natural Ga Serious Injur NULL Release of SL Natural Ga Release of SL Natural Ga Release of SL Natural Ga Release of SL Natural Ga Serious Injur NULL Release of SL Natural Ga Serious Injur NULL Release of SL Natural Ga Release of SL Natural Ga Release of SL Natural Ga Release of SL Natural Ga Release of SL Natural Ga	NULL         NULL         NULL         NULL           2         No         N           S         0         No         N           S         0         No         N           S         0         No         N           S         0         No         N           NULL         NULL         NULL         N           S         0         No         N
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Ontario         TransCanada Closed           Lincoln         Ontario         TransCanada Closed           Uncoln         Ontario         TransCanada Closed           Wonowon         British Colum Westcoast E: Closed         Portage La Pi Manitoba           Portage La Pi Manitoba         TransCanada Closed         Sarnia           Ontario         TransCanada Closed         Sarnia           Ontario         TransCanada Closed         Not specified British Colum Westcoast E: Closed           Mattice         Ontario         TransCanada Closed         Mattice           Mutter         Ontario         TransCanada Closed         Mattice           Mattice         Ontario         TransCanada Closed         Mattice           Mattice         Ontario         TransCanada Closed	55.5692 49.68017 56.63822 55.032 49.75544 45.18253 53.5474 49.76492 43.11405 50.44344 43.11368 56.72686 49.91175 48.87172 48.87172 48.87172 48.87172 48.87172 48.97494 57.31724 54.97941 54.97557 49.55574	2     -121.94446     2     Glycol     Miscellaneot, No       7     -96.64917     Not Providec Natural Gas - Gas     No       2     -121.65102     Not Applicab Not Applicab Not Applicab     No       2     -121.03098     Not Providec Natural Gas - Gas     No       4     -97.2305     Not Providec Natural Gas - Gas     No       3     -61.65236     Not Applicab     Not Applicab     Not Applicab       4     -133.35571     Not Applicab Not Applicab     Not Applicab     Not Applicab       5     -79.46307     Not Providec Natural Gas - Gas     No       6     -124.35655     Not Applicab Not Applicab     Not Applicab       6     -121.81832     0.0001     Natural Gas - Gas     No       6     -121.81832     0.0001     Natural Gas - Gas     No       6     -121.81832     0.0001     Natural Gas - Gas     No       6     -88.9396     Not Providec Natural Gas - Gas     No       7-80.83936     Not Providec Natural Gas - Gas     No       7-80.83936     Not Providec Natural Gas - Gas     No       1     -121.06074     Not Providec Natural Gas - Gas     No       1     -120.6712     Not Providec Natural Gas - Gas     No       1     -120.6712     Not		2008         2008/11/30         2008/11/30         Damage or d         Material Def         Job or systen Standards an NULL           2008         2008/11/26         2008/11/26         Damage or d         External Inte         Job or systen Standards an NULL           2008         2008/11/26         2008/12/02         Damage or d         External Inte         Job or systen Standards an NULL           2008         2008/12/02         2008/12/02         Damage or d         Equipment F         Job or systen Maintenance NULL           2008         2008/12/03         2008/12/03         Damage or d         Equipment F         Job or systen Maintenance NULL           2008         2008/12/03         Damage or d         Equipment F         Job or systen Maintenance NULL           2008         2008/12/15         2008/12/14         Damage or d         Cracking         Job or 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NC2008-114 Release of St.         12/2/2008           NC2008-115 Fire         12/2/2008           NC2008-115 Release of St.         12/8/2008           NC2008-112 Release of St.         12/9/2008           NC2008-121 Adverse Envi         12/10/2008           NC2008-121 Adverse Envi         12/11/2008           NC2008-123 Fire         12/17/2009           NC2009-002 Release of St.         1/13/2009           NC2009-012 Release of St.         1/13/2009           NC2009-015 Serious Injur         2/9/2009           NC2009-015 Release of St.         3/10/2009           NC2009-024 Serious Injur         3/10/2009           NC2009-025 Release of St.         3/10/2009           NC2009-026 Release of St.         3/10/2009           NC2009-027 Release of St.         3/10/2009           NC2009-028 Release of St.         3/12/2009           NC2009-021 Release of St.         4/2/2009           NC2009-032 Release of St.         4/23/2009           NC2009-033 Release of St.         4/23/2009           NC2009-035 Fire, Release of St.         4/23/2009           NC2009-035 Fire, Release of St.         4/23/2009	Winnipeg         Manitoba         TransCanada Closed           Charlie Lake         British Colum Westcoast Er Closed           McLaod Lake         British Colum Westcoast Er Closed           Winnipeg         Manitoba         TransCanada Closed           Boldboro         Nova Scotia         EnCana Corp Closed           Bodhoro         Alberta         Enbridge Pip Closed           Bedmoton         Alberta         Enbridge Pip Closed           Lincoln         Ontario         TransCanada Closed           Unito         Ontario         TransCanada Closed           Uncoln         Ontario         TransCanada Closed           Wonowon         British Colum Westcoast Er Closed         Portage La Pi Manitoba           Portage La Pi Manitoba         TransCanada Closed         Potter           Ontario         TransCanada Closed         Sarnia         Ontario           Not specificot British Colum Westcoast Er Closed         TransCanada Closed         Sarnia           Mattice         Ontario         TransCanada Closed         TransCanada Closed           Tumbler Ridg British Colum Westcoast Er Closed         Hamilton         TransCanada Closed           Mattice         Ontario         TransCanada Closed         Hamilton           Matrico         Mario	55.5692 49.68017 56.63822 55.032 49.75544 45.8253 53.5474 49.76492 43.11405 50.44344 43.11368 56.72686 49.91175 48.8712 42.97494 57.31724 54.97941 49.58574 43.35064 55.325 56.14652	2     -121.94446     2     Glycol     Miscellaneot, No       7     -96.64917     Not Providec Natural Gas - Gas     No       2     -121.65102     Not Applicab Not Applicab Not Applicab     No       2     -121.03098     Not Providec Natural Gas - Gas     No       4     -97.2305     Not Providec Natural Gas - Gas     No       3     -61.65236     Not Applicab Not App		2008         2008/11/30         2008/11/30         Damage or d         Material Def         Job or systen Standards an NULL           2008         2008/12/02         2008/12/02         Damage or d         External Inte         Job or systen Standards an NULL           2008         2008/12/02         2008/12/02         Damage or d         External Inte         Job or systen Standards an NULL           2008         2008/12/03         2008/12/03         Damage or d         Equipment F         Job or systen Maintenance NULL           2008         2008/12/03         2008/12/03         Damage or d         Equipment F         Job or systen Maintenance NULL           2008         2008/12/03         2008/12/05         Damage or d         Cracking         Job or systen Maintenance NULL           2009         2008/12/04         2008/12/04         Damage or d         Cracking         Job or systen Maintenance NULL           2009         2009/02/04         2009/02/06         Damage or d         Gracking         Job or systen Maintenance NULL           2009         2009/02/04         2009/02/06         Damage or d         Material Def         Job or systen Maintenance NULL           2009         2009/02/04         2009/02/04         Damage or d         Material Def         Job or systen Maintenance NULL	NULL NULL NULL NULL NULL NULL NULL NULL	NULL NULL NULL NULL NULL NULL NULL NULL	Employee / C 7/27/ NULL 7/27/ Employee / C 7/27/ Employee / C 7/27/ Employee / C 2/12/ Employee / C 7/27/ Employee / C 7/23/ Employee / C 7/27/ Employee / C 7/27/ Employee / C 12/4/ Employee / C 7/27/ NULL 7/27/	/2012         Ye           /2012         Ye           /2012         Ye           /2013         Ye           /2014         Ye           /2015         No           /2012         Ye           /2013         Ye           /2013         Ye           /2012         Ye           /2013         Ye           /2012         Ye           /2012         Ye           /2013         Ye           /2014         Ye           /2015         Ye           /2014         Ye           /2015         Ye <td>No           0         No           0         No           0         No           05         No</td> <td>Release of SL Amine       Fire     NULL       Adverse Envi Giycol       Release of SL Natural Ga       Fire     NULL       Release of SL Natural Ga       Release of SL Natural Ga       Adverse Envi NULL       Fire     NULL       Release of SL Natural Ga       Adverse Envi NULL       Fire     NULL       Release of SL Natural Ga       Serious Injur NULL       Release of SL Natural Ga       Release of SL Natural Ga</td> <td>NULL         NULL         NULL           2         No         N           2         NO         N           5         0         NO         N           5         0         NO         N           5         0         NO         N           5         0         NO         N           NULL         NULL         NULL         N           5         0         NO         N           5         0         NO         N           6         0.0001         NO         N           5         0         NO         N           6         0         NO         N           6         0         NO         N           7         0         NO         N</td>	No           0         No           0         No           0         No           05         No	Release of SL Amine       Fire     NULL       Adverse Envi Giycol       Release of SL Natural Ga       Fire     NULL       Release of SL Natural Ga       Release of SL Natural Ga       Adverse Envi NULL       Fire     NULL       Release of SL Natural Ga       Adverse Envi NULL       Fire     NULL       Release of SL Natural Ga       Serious Injur NULL       Release of SL Natural Ga       Release of SL Natural Ga	NULL         NULL         NULL           2         No         N           2         NO         N           5         0         NO         N           5         0         NO         N           5         0         NO         N           5         0         NO         N           NULL         NULL         NULL         N           5         0         NO         N           5         0         NO         N           6         0.0001         NO         N           5         0         NO         N           6         0         NO         N           6         0         NO         N           7         0         NO         N

# ENABLING GOVERNMENTS TO MAKE DATA ACCESSIBLE **BY VISUALIZING IT**

Office national de l'énergie



National Energy Board

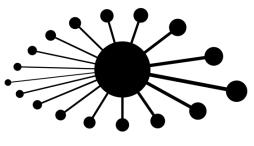


#### UNIVERSITY OF CAL 2500 University Drive NW



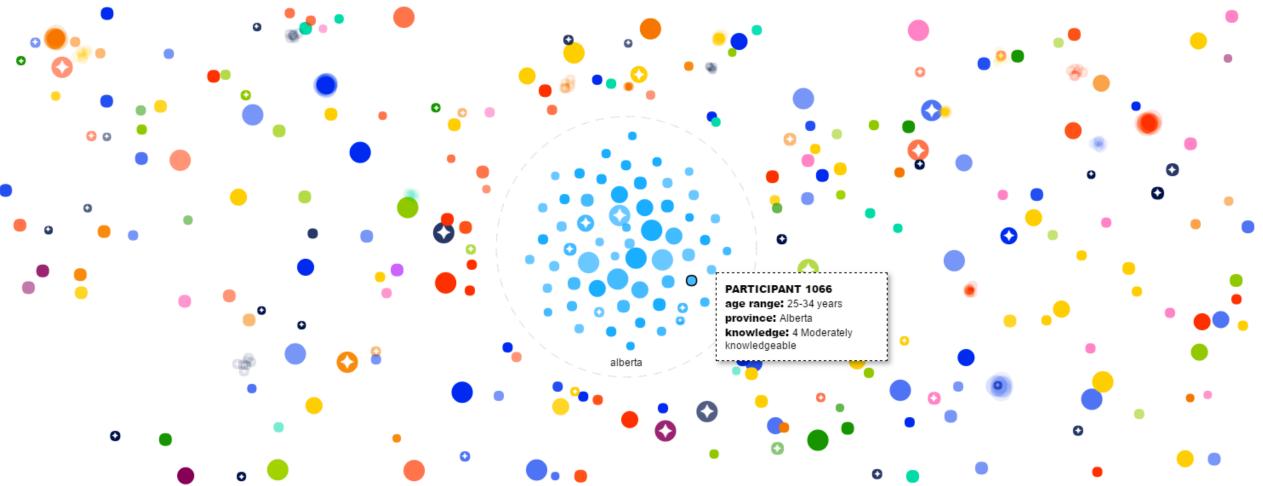
# VISUALIZATION + DESIGN





### DATA CEXPERIENCE LAB

#### VISUALIZATIONS FOR PUBLIC ENGAGEMENT

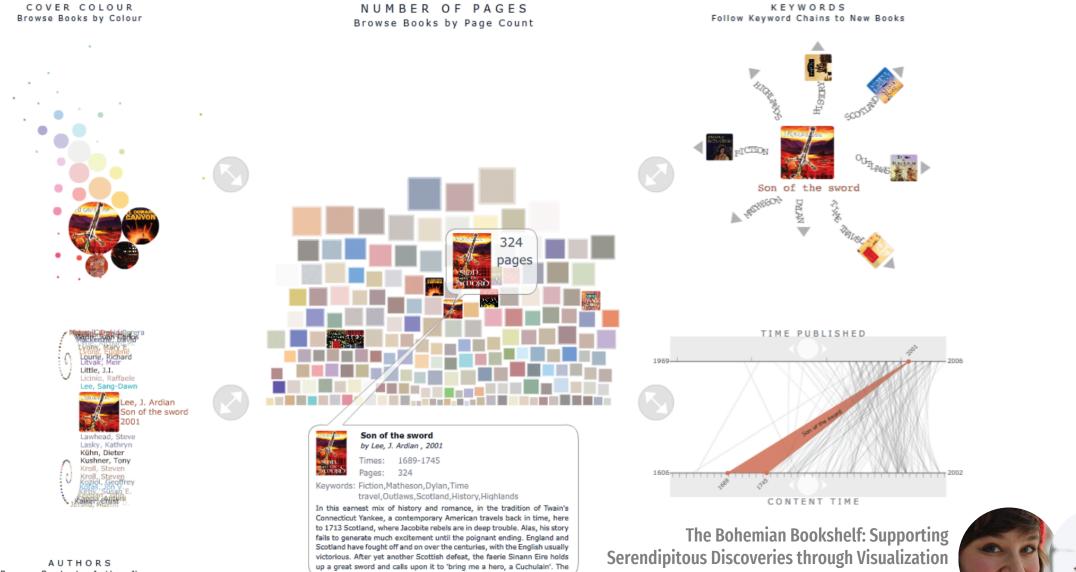


Fireflies: visualization of a Canadian attitudinal survey of HIV/AIDS

**Fireflies: Biomimicry-Inspired Infovis for Exploring Public Opinion about an Infectious Disease** Bon Adriel Aseniero, Charles Perin, Marjan Eggermont, Sheelagh Carpendale



#### VISUALIZATIONS FOR SEREDIPITOUS EXPLORATION



Browse Books by Author Name

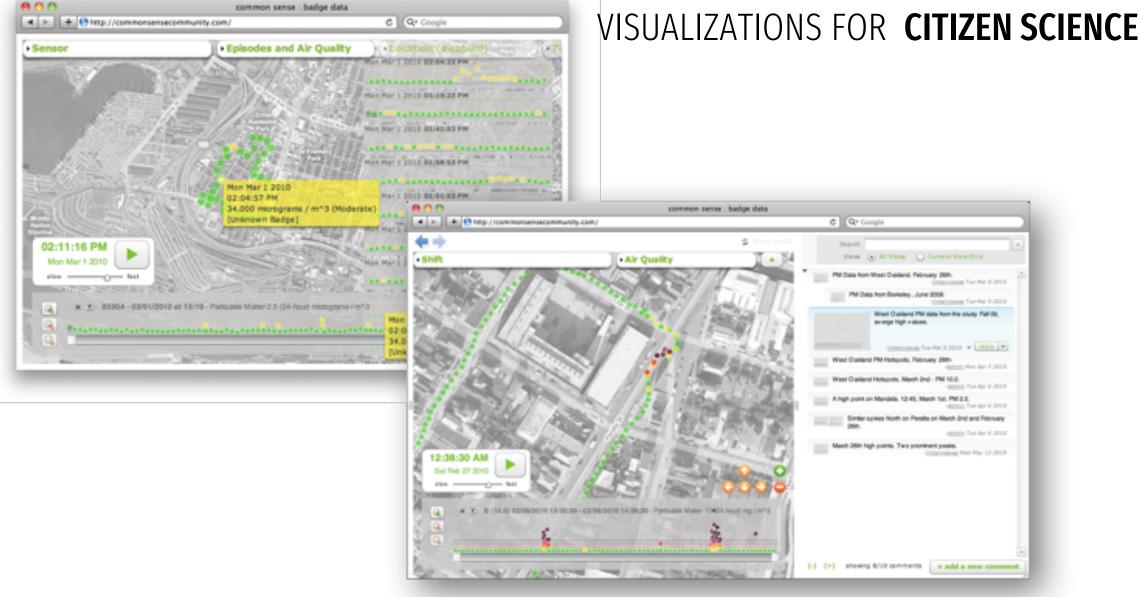
Alice Thudt, Uta Hinrichs and Sheelagh Carpendale



#### VISUALIZATIONS FOR COLLABORATIVE DATA ANALYSIS

Search X Tagged As Hypothesis Question To-Do Linked As Evidence For Evidence Against	ww.commentspace.net/media/swf/CollegeROIVis.swf&showLinks=f 🏠 🔩 🔀 🙆 🕏
All Comments (3) Current View + Comment	data from Bloomberg BusinessWeek
expensive and not a great bang for your buck <u>Kathy</u> Oct 14 2010           UC System           The UC system looks like they cost a little more but definitely are better in terms of ROI          Kathy Oct 14 2010          Kathy Oct 14 2010	Private       Public (In-State)       Public (Out-of-State)       Clear All Selections         Cost v. Annualized Return       Total Cost v. Grad. Rate       Grad. Rate vs. 30-Year Return       Axis Controls         15%       14%       University of California, Berkeley       13%       Texas A&M University       Stanford University         12%       University of Colorado - Boulder (UCB)       University of Southern California (USC)       Notersity of Oregon         10%       Baylor University       Baylor University       Grad. Baylor University         6%       6%       6%       6%
No UC Merced or San Francisco?           Somehow UC Merced and UCSF don't showkennyboy256         Yea i was noticing that as well         Yea i was noticing that as well         *Kathy       Oct 14 2010         Show me the money!   It also looks like I've improved my market valueyay for that!         *Kathy       Oct 14 2010         Go Bears   And it also seems as I have definitely	5% 4% \$50,000.00 \$90,000.00 \$130,000.00 \$170,000.00 \$210,000.00 Total Cost To Graduate CommentSpace: Structured Support for

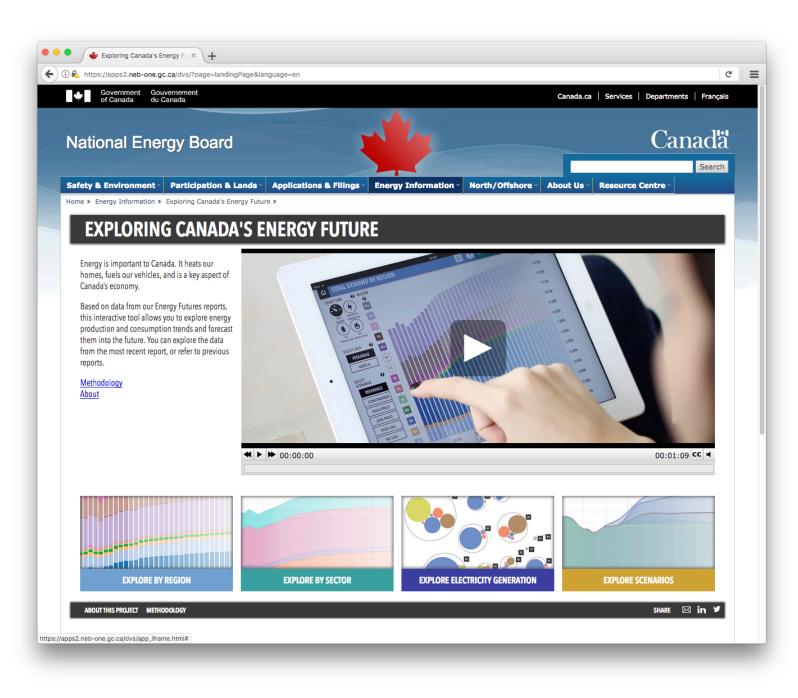




Common Sense Community Willett et al.



# THE VALUE OF OPEN DATA VISUALIZATION FOR PUBLIC INSTITUTIONS



### EXPLORING CANADA'S ENERGY FUTURE

https://apps.neb-one.gc.ca/**dvs** 

#### https://apps.neb-one.gc.ca/**dvs**



# VISUALIZING PRELINE INCIDENTS

# A CHALLENGING PUBLIC DATASET

# NEB REGULATES **73,000<sup>KM</sup> OF PIPELINE**

# ONGOING PROCESSES FOR **NEW PIPELINES**

# **100+ INCIDENTS/YEAR** HANDLED BY NEB INSPECTORS

# COMMITMENT FROM NEB LEADERSHIP TO MAKE THIS DATA ACCESSIBLE AND OPEN TO PUBLIC SCRUTINY

# DON'T JUST RELEASE DATA, MAKE IT ACCESSIBLE

The control of the control of the first of the control of the cont

DON'T FORGET THE INFORMATION REQUEST FORM ? ? ?

#### REPORTS OF LEAKS AND BREAKS IN GAS / OIL PIPE LINES COMMENCED 1 JANUARY 1965

VOL. I REPORTS OF LEAKS & BREAKS IN GAS/OIL/PRODUCTS PIPELINES ENDING 31 DEC. 1972

#### REPORTS OF LEAKS AND BREAKS IN PIPE LINE

COMPANY: -- INTERPROVINCIAL PIPE LINE LIMITED N.E.B. FILE NO.: -- 1795 - JI

(I)P

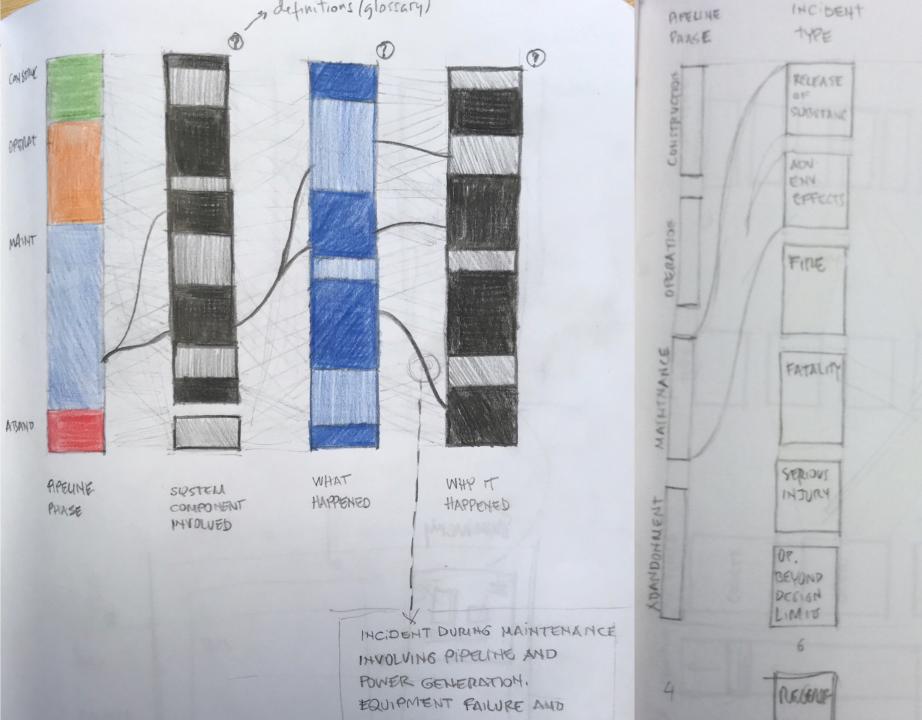
	CATION OF INCIDENT E POST & LAND DESC.	DATE OF OCCURRENCE	DESC OF FAILURE	PIPE SPECIFICATIONS DIAMETER & WALL THICKNESS	REMEDIAL ACTION TAKEN FOR REPAIR	LOSS OF PRODUCT	INJURIES OR FATALITIE	S RE
1				1976				
1		120000000	Sharps 1% deat in pipe . Lock was detected while pipe was accorded during upgrading	20" 0.0	mat Bird and the standard and	Approx. 5-6 Barrels	None	1
	6, Con. 6, Two. Connumes,		while pipe was existent during upgraving program.	30 09	54" Plideo split sheeve installed.	information and and and		
Crss.	STOR MONT 2-1-69/D-56-2764-	0						
-		0 10 74		34" OD	A SUCTION OF THE 34" TANK LINE		NoNE	CRUDE OIL WAS
EDI	NONTON TANK FARM	12-12-76			WAS CUT & BLINDED			ELECTRICAL MANHOLE
-							NONE	SHUTDOWN OF LINE 3
. 10	RETNA PUMO STATION	11.12.76	Small leak developed on a bonnet gasket of the 12° gate volve causing oil spill	16'00	Looky value repaired	10 TO 15 BARRELS		(Incident No. 43-76) car
			Cousing oil spin					
	E4 8-1-1- WPM- MAN.			30"	LINE SHUT DOWN - REAWES COMPLETED	APPROX IOBBLS ON SURFACE	None	LOSS OF THROUGHP
TIC	AKEHEAD PIL NOT NEB	29,12,76		30	30 - 40 110			
1.4					1077			
					1977 a convert conver	COTINATED OIL SPILL HOODE	NONE	(defective experiment a pop-og)
-		26-01-77	OIL OVERSLOWED TAKE NO. 20. OIL CONTAINS WITHIN DIGED AREA OF TAKE	H/A	THERE TO BE CLEMENT, CARRY SUILE (TREASURE - HIS LOUTLE CLEMENT REPORTED	COTHATES ON SPILE 100 BIL	HONE	
.77	SE 5-33-23-4 ALTA	01-02-77	Ole Dientienten	- MIS	Where DEALED, REALED IN THIS TO THE ARE THE OWNER THE AVEL OF A DEALEMENT	ESTIMATED OIL SPILE ISREET		Populie empire type
77	Server The FARM	The second s	Ston BOL SALAPED BUCTION WINE TO TANKS	N/A N/A	LING HAS BALA ISOLATED	Contraction of the los see		
-77	GLENAVON RIMPING STATUS CRONER STA. NE 17-9-28-4	de-04-77	200 BL TAR DENANTO & LEAK 1500 BL ESLAPED 200 BL LEAK IN SUCTION WINE TO TANK 103, LOH 105 OL LEAK DE A DI'S TANK TARK PPC WAS DIWLICK FROM BUTTON SIAM TANK 74 OIL LEAK FROM BUTTON SIAM TANK 74	34"4	LUE DEALED, BREENSTIMP & BAADRIND PERSON IN TAKE BACK, CENECOLAN SCATHOLANT CONTR	See BAL OF CRUCE SECAPLO IF DITOH	Navid	The Wind Pumper Day & MAN
-77	THE REPART	03-05-11	Discould RED BY A PATRAL SCAN TARE 74	· N/A			NONG	DEAL MAR SPECIAL CARE LAND
2-77	EDMATTAN TANK PARM 4 ALTA 5 EV/4 5-53-23-4 ALTA 1-1/2 82-17-1	1-112 13 MAY . TT	CLUCK ON DISCHARCED IN SPATION YARDING	10-	LIRES 2 13 SEAT DAWN, NUME. CRAW WEREING TO FILD LEAX 20041. P.L. LINE SHUT DOWN PONDING REPAIRS TO RELIF WALKE OF GULF DIL	11/4	11/4	TANK ON CLARKSON TERMINOL
5-77	REDINA PUMP STA,	14 00 155 0-155 MST 1AWA.77	CLUCK ON DISLUBRED IN STATION PARD-INS RESENCE THAT (NOT 1. P.K.L.) OVORTIONS RELICE THAT (NOT 1. P.K.L.) OVORTIONS RELICE THAT OF CRUDE	s N/A	REPAIRS TO REVER VALVE OF GULF OIL	HA	N/A	LINE I SHUT DOWN FOR IS
0-77	CRACK PUMPING STATION	2446 77			ELEVIENTY Was DISCOMPECTED Repaires MAPE. Mel. Downally Trubal a the Engineering of Room Games.	AL	one man injured treated for injus	ces to one leg, returned to work som
31-77	CLARKSON TERMINAL	0 5.15 77		H/A			LONG	Unit 9 3 4 ( 1844 MP Hand Make Mair?)
31-17	GLANBOLD STALL	TE 30ct. 77	TANK OVERFLOW NOT IP.L.L.	N/A	DARAGED SEAL WAS REPLACED	40 BOLS	No of the	
NUMBER	GLENBOLD STATION S REGINA PUMP STATION S GULFS CLARKSON REFINE	RT 2003.TI	Tannedy, Parm P Son & the Start B. 4	14 / · · ·				
INBER.	GULFS CLARKSON REFINE CRIKPUMP STA ST	2 23 Nov 1			1978			
6-77	Crack Pump Site				oil centerned in drainage d. Ch	laige amit	NONE	No INTERRUTTING OF SHEVE
-				30"	Risten sections to be replaced Maassa 374 of Containing in Ste	110 BARKELS	NONE	and the state of the
4 40	Let 21, Con 3, Two Construct, Gy Stemant Ise E at Discon	GHI 14 JUNA		N/A	1979		NUNE	
9-78	Log 3. d. Con 6 Twy Lancer	25 DK	78 issue a merca dece	30"	P.H SILLIVES	2 BARRES		Normal scence Life Job on
37-71	Chanter Pour STN		The an John Ace and	NA	ENL. REPAIR	N/A	10.05	LINE SHUT DEAN IS HERE
31-11		8-1-77	TALAN DEWN.	N/A	1.01 3 SHUT DING IS THE WALL LEAR WAS TAILAND.	10 BARRIES	None	ever the of Permise Lest.
	Lorg conte that prevention	9-1-7	OF TRANSMITT	N/A	A BULL AND SLEASE BURL INSTANCO	2 BARRELI 20-25 GAL	news	a DAMATING IN GINE 3
2-7	NARDISTRY PUNPDIATION	26-2-3	17 a while LEAK	N/A	A PLIDED SPLIT SURVE INSTALLED	UNKNOWN		of gels Completion.
3-7	2 Pump STA	3-22	- 79 PILL PURETURED	N/A	ATALL REDLACED	252	Nov	ILL WILL SUBMIT FORTHER
11-7		the state	-77 FAILURE	nja	Some over Finely is sitial confidents to compare	Adle	NONE	
10	9 KEYSER PUMP	asahalank 34-4	-71 PUMP SEAL VALLE	NA	LIVE 3 SHUT DOWN UNTIL RELAR MAD.			

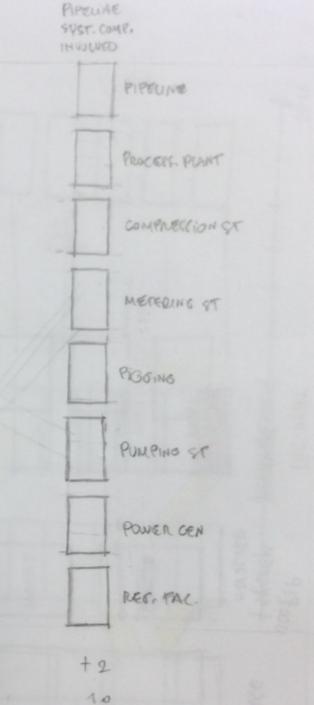
# DATA UNDERSTANDING AND COLLABORATIVE DESIGN WITH NEB EXPERTS

## FOR ANY GIVEN INCIDENT...

LOCATION **100+** PIECES OF INFORMATION DATE PROVINCE **TYPE OF INCIDENT** PFR INCIDENT COMPANY WHAT SYSTEM COMPONENTS WAS THE SYSTEM UNDER CONSTRUCTION? IN OPERATION? RETIRED? **RELEASE TYPE/SUBSTANCE/VOLUME** WHAT HAPPENED? WHY DID IT HAPPEN?

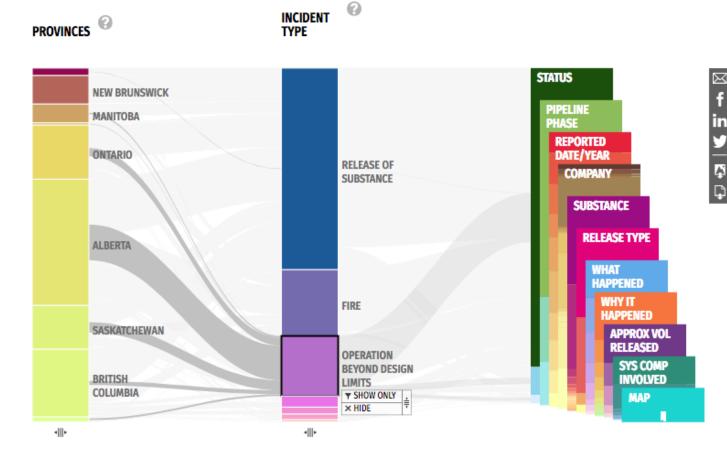
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### NATIONAL ENERGY BOARD PIPELINE INCIDENTS

https://apps2.neb-one.gc.ca/**pipeline-incidents** 





National Energy Board



VizworX

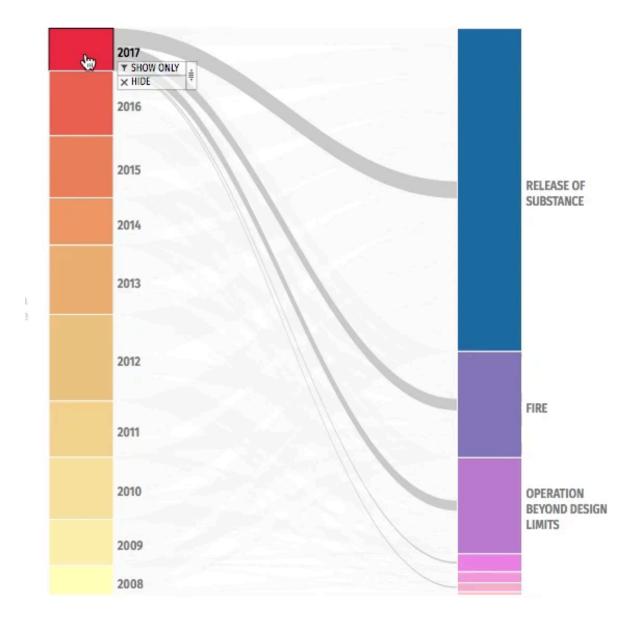


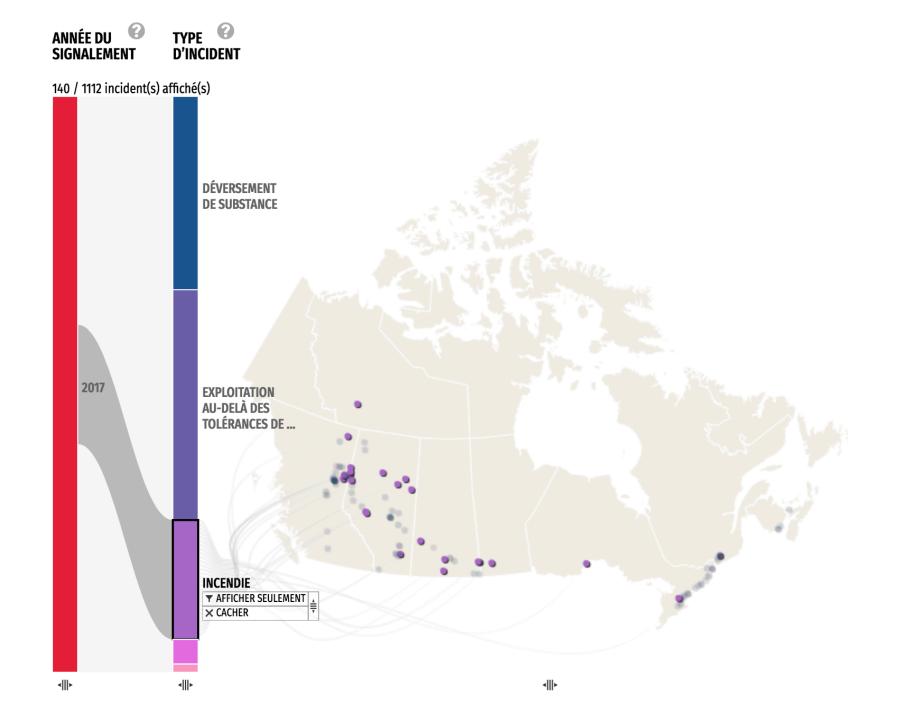
REPORTED DATE/YEAR

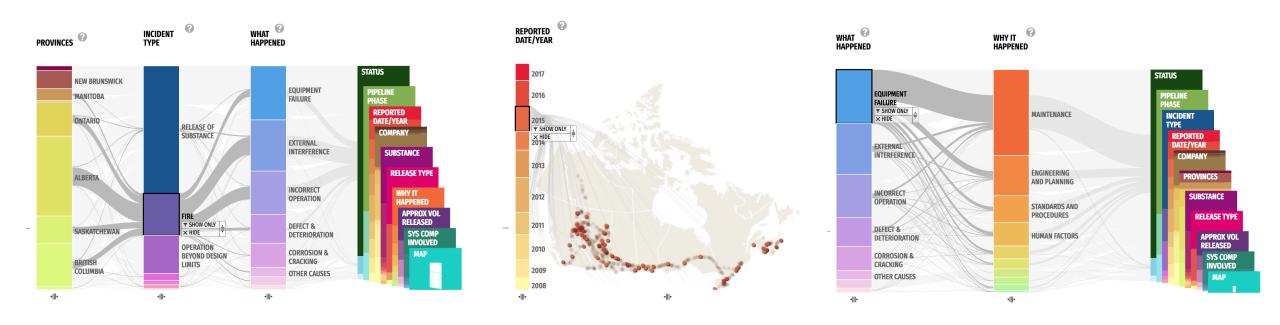
#### INCIDENT CONT

# **1,040** PIPELINE INCIDENTS

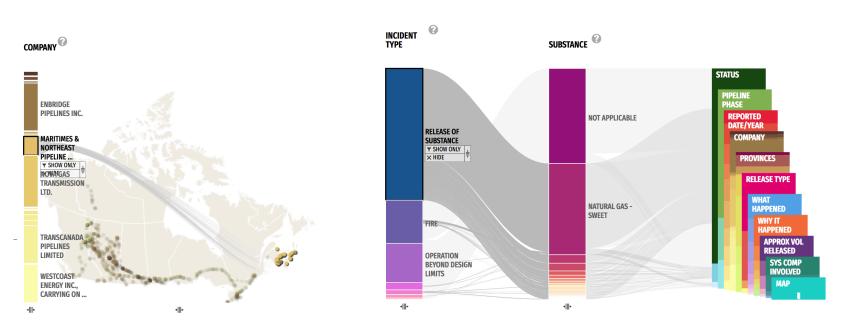


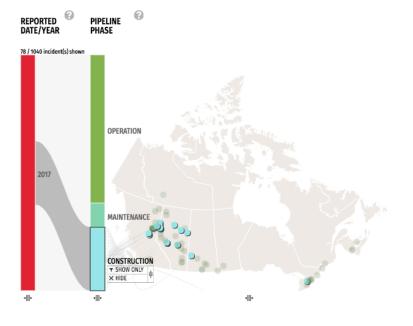




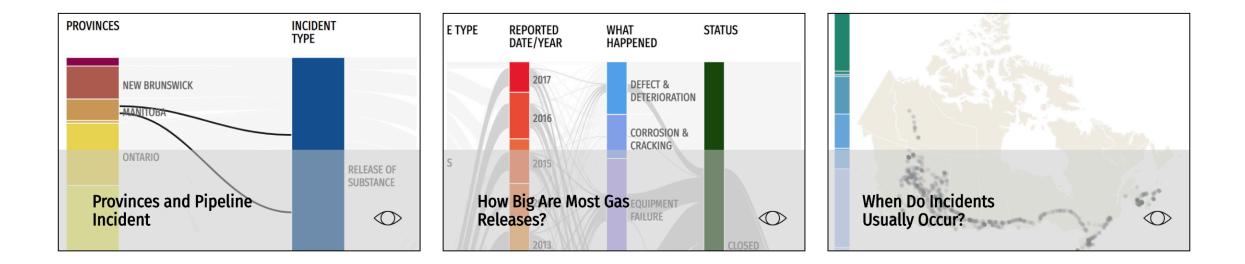


#### NOT JUST ONE VISUALIZATION, BUT A VISUALIZATION SYSTEM





## A STORYTELLING PLATFORM BOTH FOR NEB EXPERTS AND FOR THE PUBLIC



#### Canada

#### NEB Canada 🤣

Official account for the National Energy Board. Terms: neb-one.gc.ca /glbl/mprtntntc... Francais: @ONE\_NEBCanada

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#### 661 Photos and videos



#### New to Twitter?





#### Posts



National Energy Board October 12 at 8:51am · @

Feature Article: 25 Years of Atlantic Canada Offshore Oil & Natural Gas Production - This year marks a quarter century of offshore oil and natural gas production in Atlantic Canada. From fields discovered as far back as 1969, production from Nova Scotia and Newfoundland and Labrador has allowed those provinces to fill growing global demand for oil and natural gas. While some fields are winding down, new discoveries are being made and new projects announced, leading to the expectation that Atlantic Canada will continue to be an active participant in Canada's oil and gas sector for many years to come. http://ow.ly/NUg030fPFvT

Map of Offshore Oil and Gas Activities in Atlantic Canada

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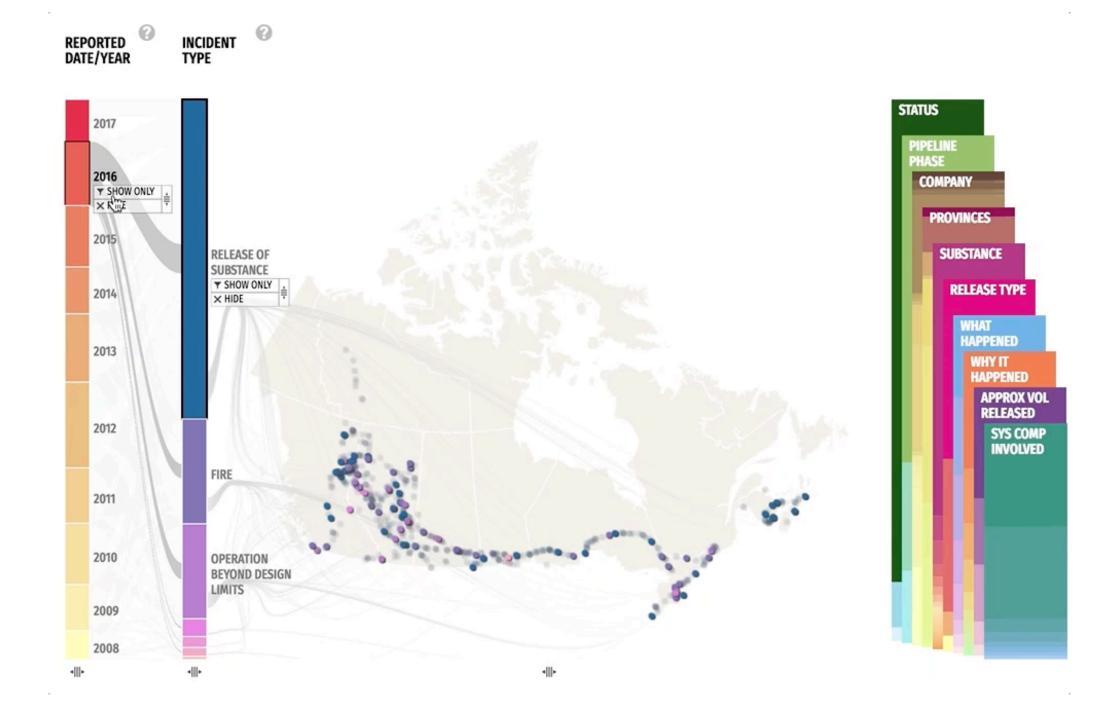
Government Organization in Calgary, Alberta	
Closed Now	
Community	See
128 people like this	
163 people follow this	
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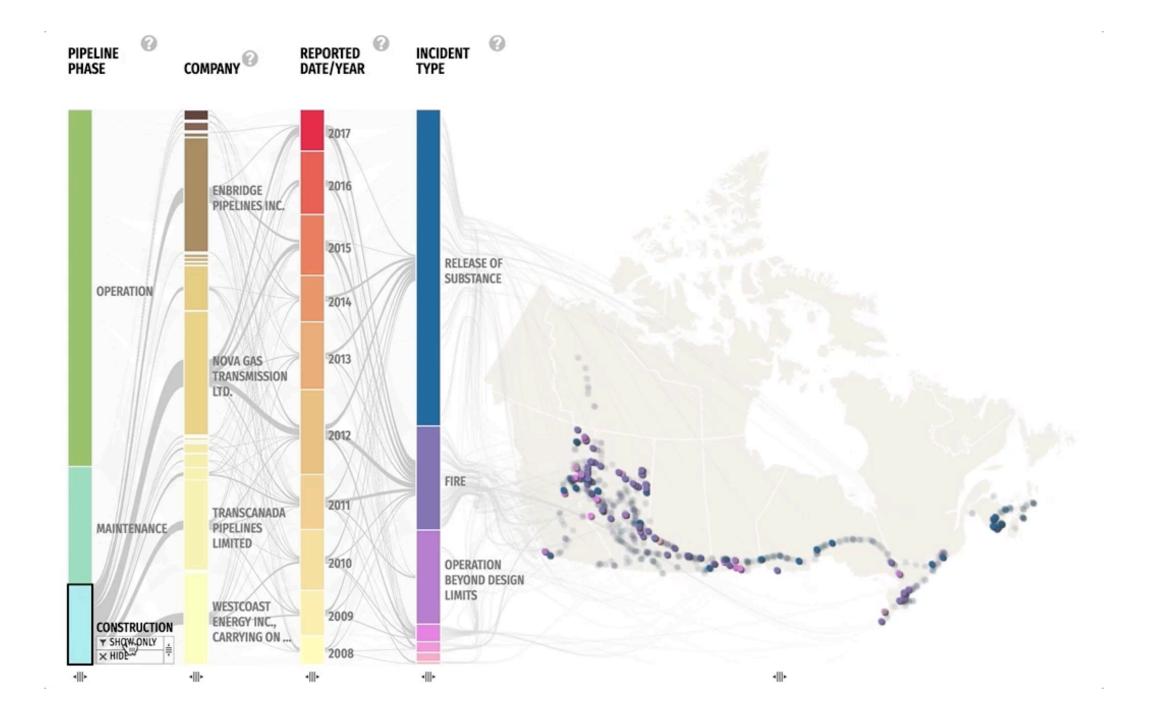
- Government Organization
- Opens tomorrow Closed Now

People

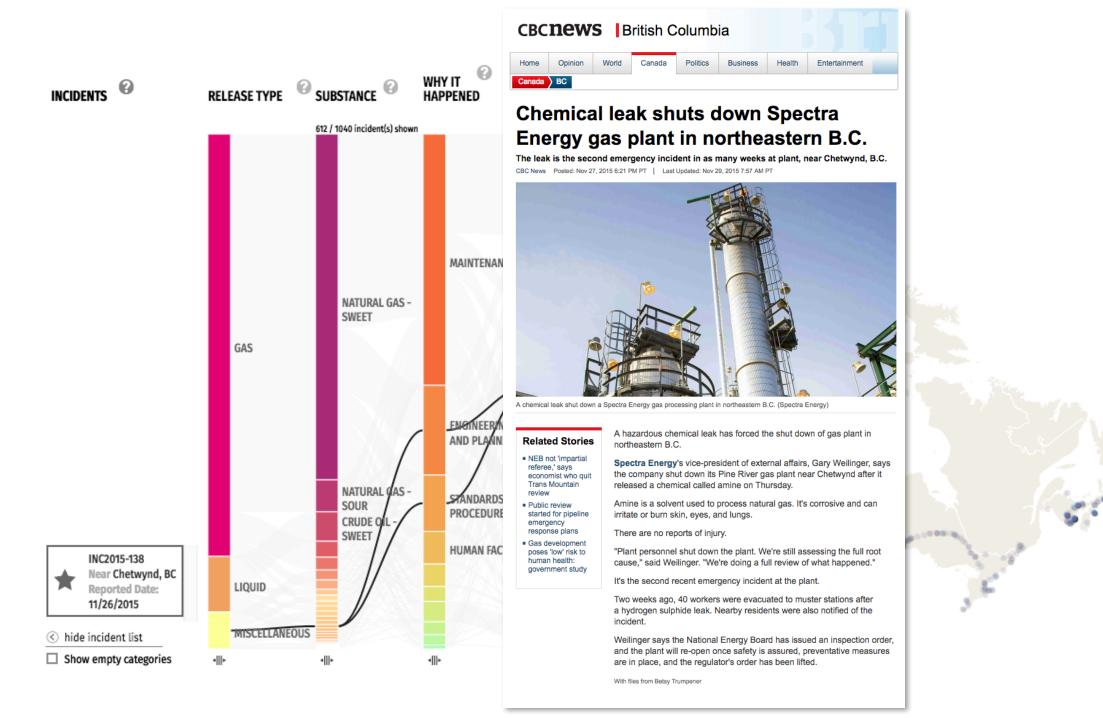
128 likes

# HELPING CANADIANS UNDERSTAND PIPELINE INCIDENTS





# ENCOURAGING PUBLIC DIALOGUE GROUNDED IN DATA



# GIVING INSTITUTIONS **A NEW LENS** ON THEIR OWN **DATA PRACTICES**



## MAKING DATA TRULY ACCESSIBLE ISN'T EASY...

#### PRACTICAL AND INSTITUTIONAL BARRIERS TO DATA TRANSPARENCY

#### VISUAL TOOLS A CHALLENGE VISION-IMPARED AND LOW-LITERACY GROUPS

NO ONE-SIZE-FITS-ALL DESIGN SOLUTIONS

## ...BUT WE'RE JUST GETTING STARTED

#### **SHOWCASING THE VALUE** OF OPEN DATA VISUALIZATION FOR GOVERNMENTS

#### HELPING BUILD THE CAPACITY TO CREATE TOOLS THAT EMPOWER THE PUBLIC



#### **DR. WESLEY WILLETT** UNIVERSITY OF CALGARY

### NATIONAL ENERGY BOARD PIPELINE INCIDENTS

https://apps2.neb-one.gc.ca/pipeline-incidents

# EXPLORING CANADA'S ENERGY FUTURE

https://apps.neb-one.gc.ca/**dvs** 

Office national de l'énergie



National Energy Board



VizworX

