

MSD Deer Creek Sanitary Tunnel Pre-Blast Meeting

Haddington Site – City of Clayton

Heath Groom
Dan Swidrak
3/29/2019
4:00PM



SAK[™]

Pipeline Infrastructure. Solved.[™]

Agenda

- Project Overview – Haddington Site
- Blast Schedule
- Blast Permit Status
- Blast Procedure and Safety
- Monitoring Instrumentation
- Vibration and Air Overpressure Limits



Agenda (cont.)

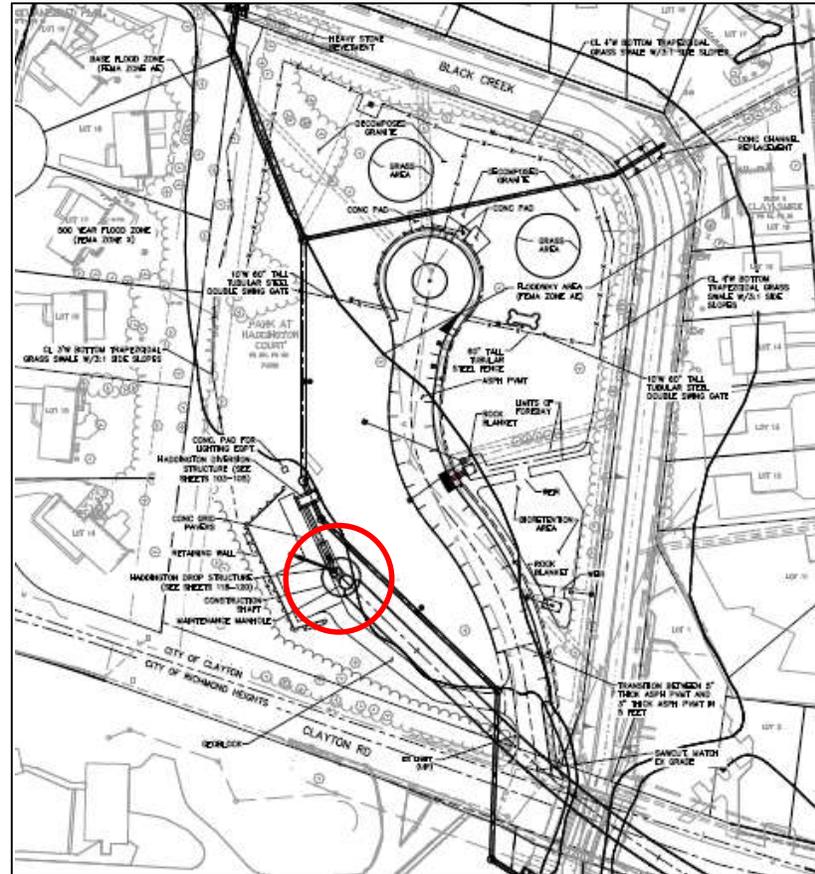
- Post-Blast Reporting Requirements
- Results of Pre-Construction Survey
- Construction Notifications
- Environmental Considerations
- SAK Insurance Policy
- Questions



Introduction

- Heath Groom
- hgroom@sakcon.com
- 913-953-6001

Project Overview – Haddington Site



Introduction

Project Overview

Blasting

Reporting

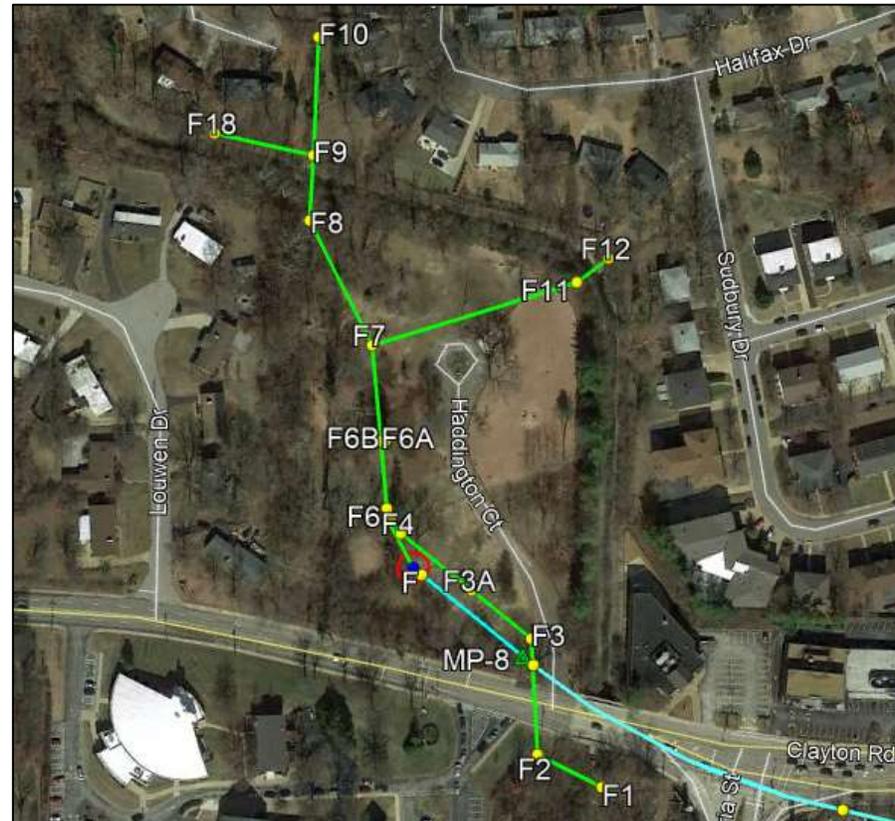
Questions



SAKTM

Pipeline Infrastructure. Solved.TM

Project Overview – Haddington Site



Introduction

Project Overview

Blasting

Reporting

Questions



SAK[™]

Pipeline Infrastructure. Solved.[™]

Project Overview – Haddington Site



Introduction

Project Overview

Blasting

Reporting

Questions



SAK[™]

Pipeline Infrastructure. Solved.[™]

Blasting Schedule

- Blasting at the Haddington Site will begin late February 2019 and conclude by August 2019.
- Blasting could occur between 7AM and 6PM, Monday through Friday.



Blast Permit Status

- Saint Louis County Blast Permit to be issue prior to blasting
- ATF Blasting Permit has been issued



Blast Procedure and Safety

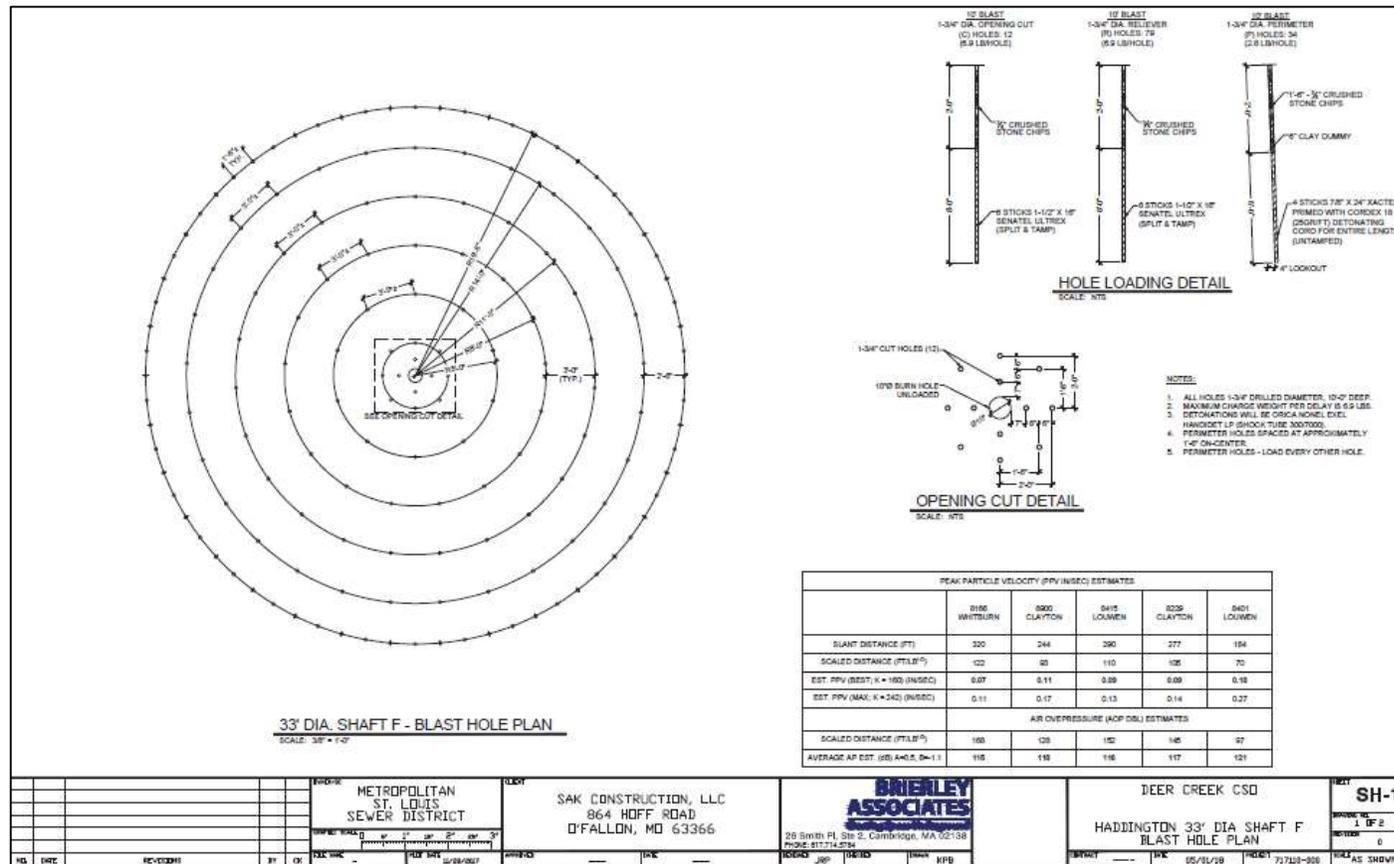
- Blasting Process
- Test Blast
- Warning Signs
- Fly Rock Prevention



Blast Covers



Blast Design



Blast designs have been prepared by a Blast Consultant, Brierley Associates.

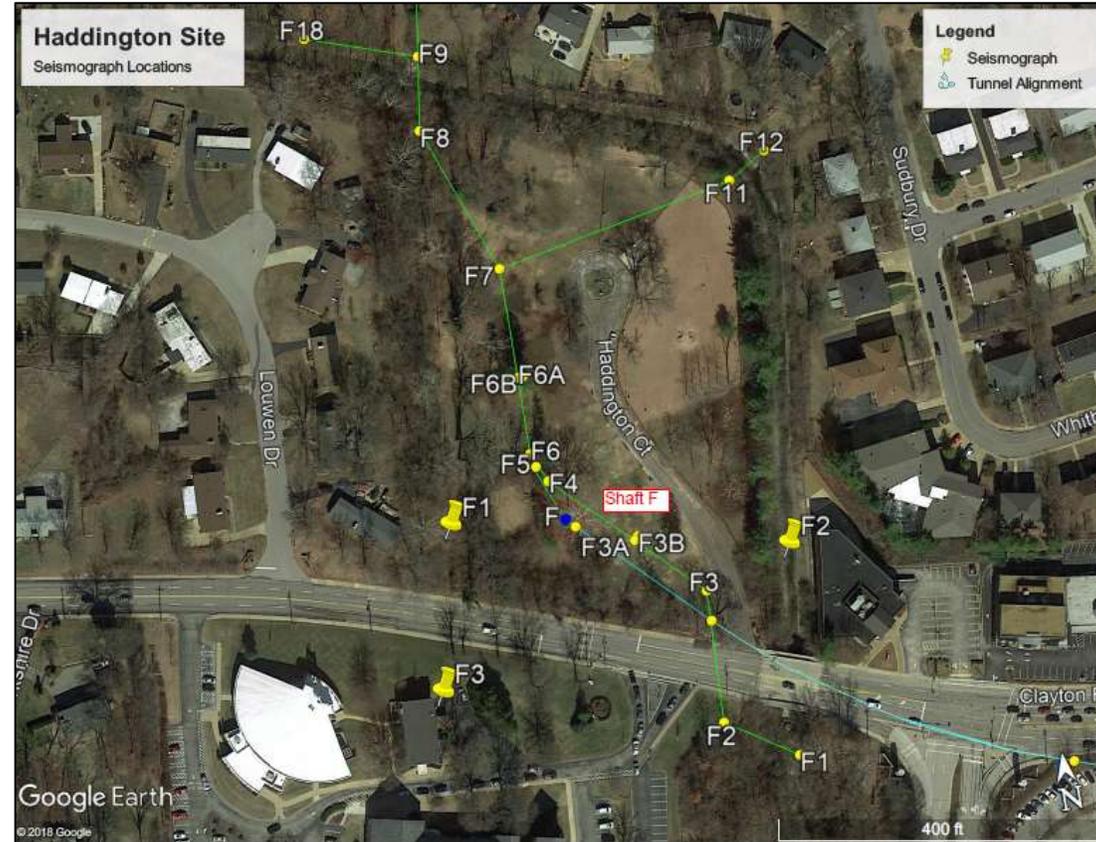


Estimated Vibration and Air Overpressure

PEAK PARTICLE VELOCITY (PPV IN/SEC) ESTIMATES					
	8166 WHITBURN	8900 CLAYTON	8415 LOUWEN	8229 CLAYTON	8401 LOUWEN
SLANT DISTANCE (FT)	320	244	290	277	184
SCALED DISTANCE (FT/LB ^{1/2})	122	93	110	105	70
EST. PPV (BEST; K = 160) (IN/SEC)	0.07	0.11	0.09	0.09	0.18
EST. PPV (MAX; K = 242) (IN/SEC)	0.11	0.17	0.13	0.14	0.27
	AIR OVEPRESSURE (AOP DBL) ESTIMATES				
SCALED DISTANCE (FT/LB ^{1/3})	168	128	152	145	97
AVERAGE AP EST. (dB) A=0.5, B=-1.1	115	118	116	117	121



Haddington Site Monitoring Locations



Introduction

Project Overview

Blasting

Reporting

Questions



SAK[™]

Pipeline Infrastructure. Solved.[™]

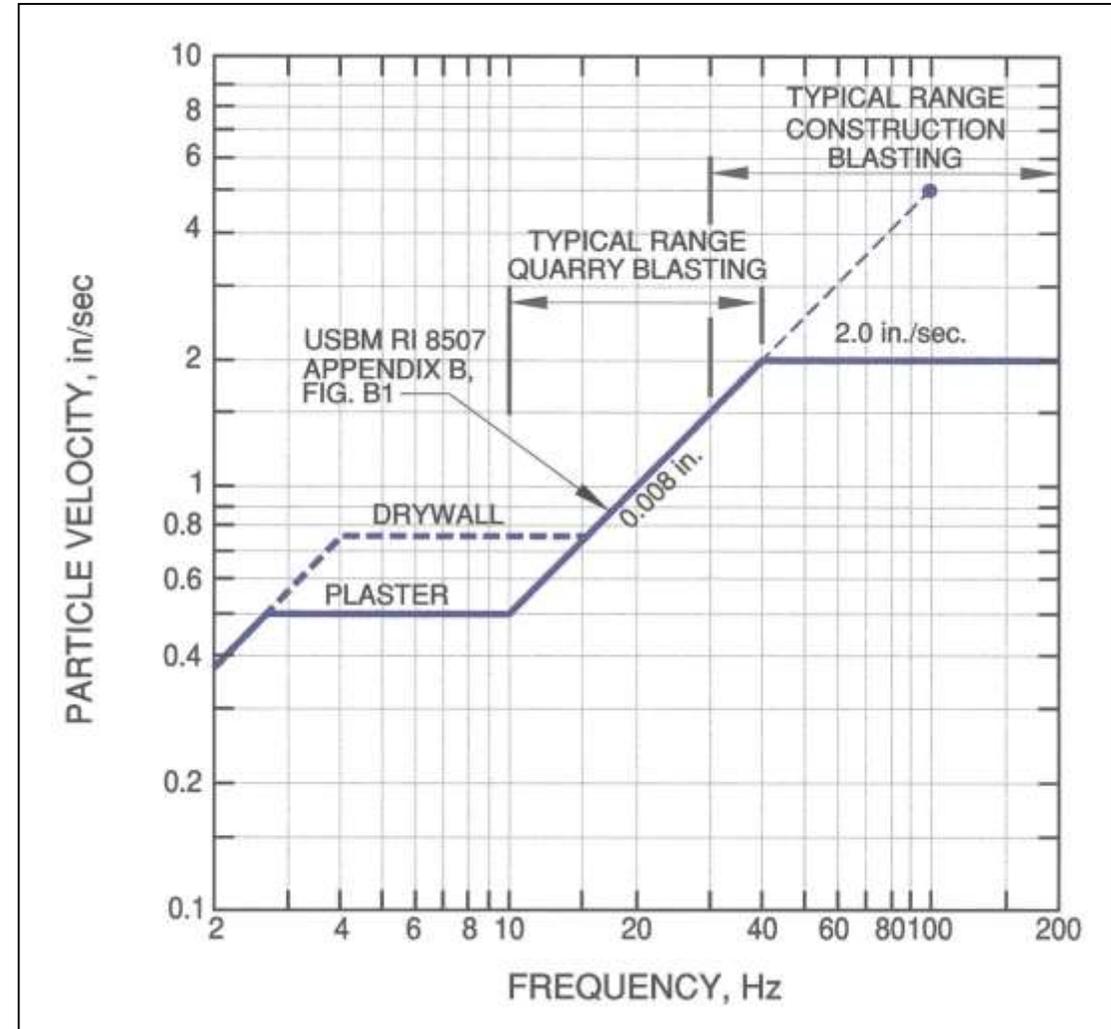
Monitoring Instrumentation

- Geosonic SSU 3000-EZ Plus
- Three recording modes:
 - Triggered - seismic or sound
 - Continuous
 - Sustained trigger



Vibration Limits

- Limits per US Department of Interior, Bureau of Mines Report 8507, Appendix B
- Standard practice in mining operations for 50 years



Air Overpressure Limits

- Air-over pressure shall not exceed 133 decibels at any occupied structure
- Air over pressure monitoring shall take place at the nearest structure



Blast Reports

- Depth of blast holes and the location
- Type, strength and quantities of all explosives, types and quantities of detonators, powder factor (lb/cy), and actual firing times of all charges
- Total explosive loadings per round and maximum charge per delay
- Type of rock blasted



Blast Reports (cont.)

- Comments by the blaster in charge regarding any misfires, unusual results, or unusual effects
- Date and exact firing time of blast; name of person in responsible charge of loading and firing and blaster permit number
- Signature and title of person making recording entries
- Record of peak overpressure



Blast Report Example

MISSOURI DIVISION OF FIRE SAFETY BLASTING REPORT				
Project Name:				
Blast Location Address:				
City:			County:	
Blasting Company:				
Contact Person:			Phone:	
Name of Blaster:			Blaster License No.:	
Date of Blasting:		Time:	Day:	
Shot Type: Quarry: Road Construction: Trench: Construction: Other:				
Material Blasted:				
Burden (feet):	No. of Holes:	Hole Diameter (inches):	Hole Depth (feet):	Spacing (feet):
Stemming Type:			Top Stemming (feet):	
Explosive Weight per hole:		Total Explosive Weight in shot:		
Delay Periods Used (in milliseconds):	Maximum weight detonated per delay:	Maximum holes/decks per delay:		
Initiation System: Electric: Nonelectric:	No. of circuits:	Timer interval (if used):		
Explosive Type Used:				
Explosive Type Used:				
Explosive Type Used:				
Explosive Type Used:				
Explosive Type Used:				
Location of Nearest Uncontrolled Structure:				
Direction & Distance to Nearest Uncontrolled Structure:				
Calculated Scaled Distance to Nearest Uncontrolled Structure:				

MISSOURI DIVISION OF FIRE SAFETY BLASTING REPORT			
Time: _____	<input type="checkbox"/> a.m. <input type="checkbox"/> p.m.	Location: _____	Date: _____
Typical Borehole			

Introduction

Project Overview

Blasting

Reporting

Questions



SAKTM

Pipeline Infrastructure. Solved.TM

Post Blast Seismic Analysis

Introduction

Project Overview

Blasting

Reporting

Questions

Seismic Analysis Velocity Waveform Analysis

Serial Number: 7752
 Firmware Version: 0C-05.11
 Event Date: 09/30/2013 18:14:04 (UTC -05:00)
 Event number: 10
 Recording Time: 5 s
 Client: SAK
 Operation: MSD - LRFMPROJECT
 Location: Gas Main
 Distance:
 Operator: Vibra-Tech IP GSM
 Comment:
 Seismic Trigger: 0.05 m/s
 Sound Trigger: 127.8 dBI

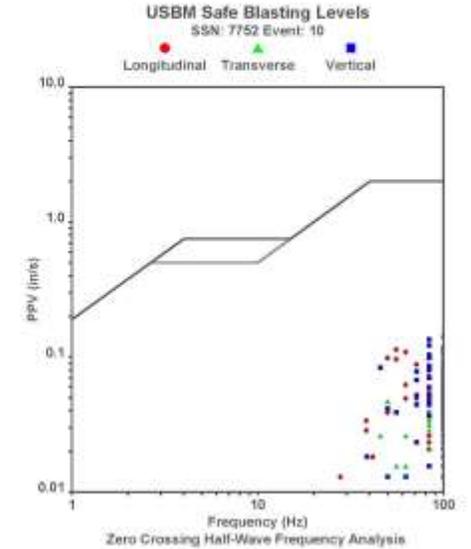
Additional Info:
 j-GEO-07486
 N38 22 07.6 W96 16 17.9

Summary Data

	L	T	V
PPV (in/s):	0.1375	0.0675	0.13
FREQ (HZ):	100	83.3	83.3
PD (.001"):	0.3575	0.145	0.26
PFA (g):	0.2214	0.1107	0.1888

Peak Vector Sum: 0.1475 in/s
 Peak Air Pressure: 129 dBI
 0.009468 psi @ 33.3 HZ

Shotable Calibrated
 On: 09/14/2013 (UTC -05:00)
 By: GeoSonics, Inc.
 339 Northgate Drive
 Warrenton, PA 15086 U.S.A.

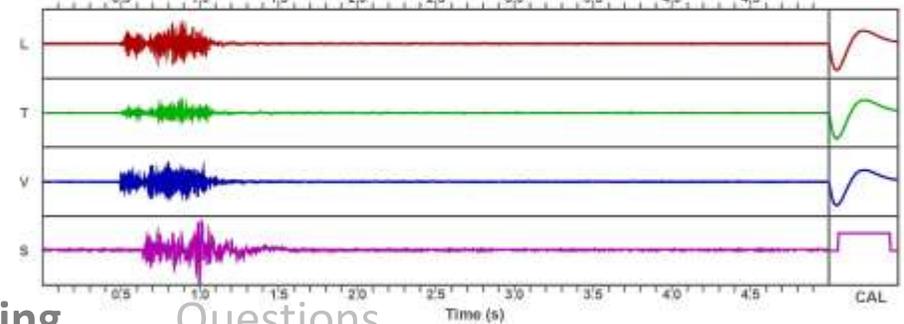


Waveform Graph Scale

Time Scale: 0.1 s
 Seismic Scale: +/- 0.20625 in/s
 Sound Scale: +/- 0.009468 psi

Velocity Waveform

SSN: 7752 Event: 10



Post-Blast Reporting

- Post-blast inspections will be performed in response to complaints, or claims made by property owners.
- Brent Duncan, SAK, is the contact person for blast complaints.



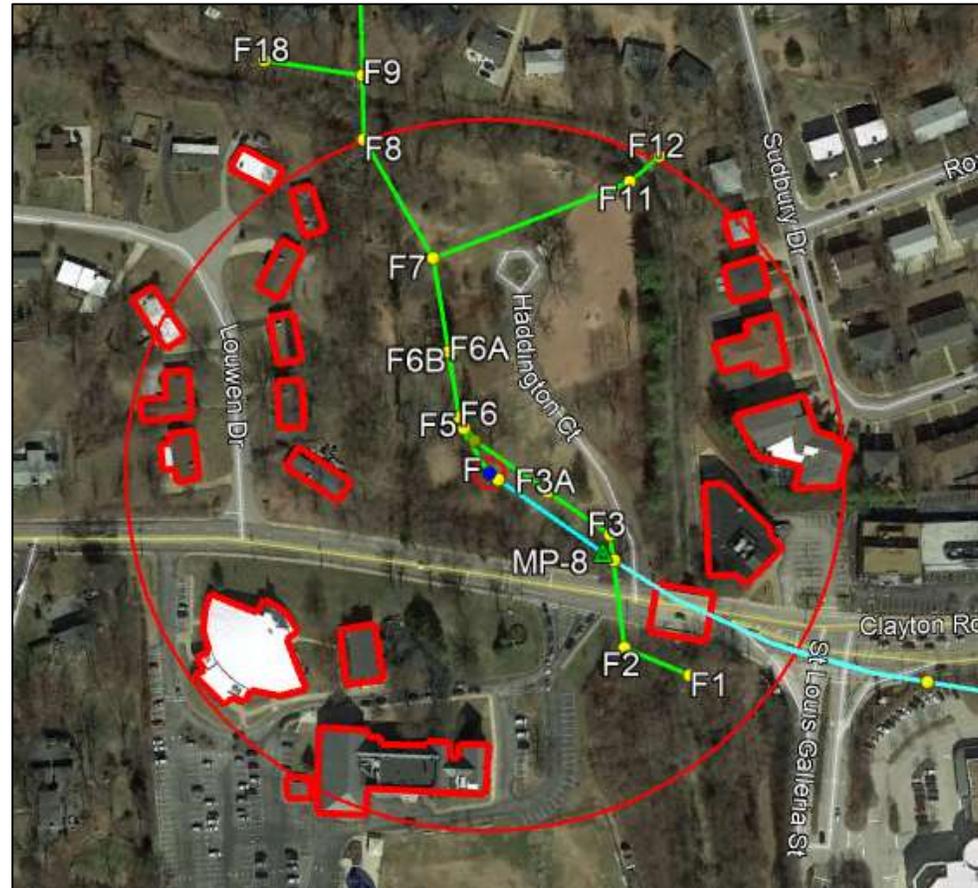
Construction Notifications

- Letters have been sent to:

City of Clayton	809 Sudbury Dr	8407 Louwen Dr
8225 Clayton Rd	8435 Louwen Dr	8401 Louwen Dr
8166 Whitburn Dr	8439 Louwen Dr	8400 Louwen Dr
833 Sudbury Dr	8433 Louwen Dr	8408 Louwen Dr
829 Sudbury Dr	8423 Louwen Dr	8416 Louwen Dr
821 Sudbury Dr	8415 Louwen Dr	8900 Clayton Rd



Results of Pre-Construction Surveys



Introduction

Project Overview

Blasting

Reporting

Questions



SAK[™]

Pipeline Infrastructure. Solved.[™]

Results of Pre-Blast Surveys

- Performed by Vibra-Tech Inc.
- Visual condition inspection of the exterior, and interior of the structures listed below. Inspection include audio description, digital photographs, and digital video.

MAP # on INSP Plan	Site	Segment	Exhibit A#	Street #	Street Name	Notified VI To Start	Expected Finish Date	Inspection Plan Submitted	Inspection Plan Approved	1st Letter Sent- Regular Mail	2nd Letter Sent- Certified Mail	Inspection Scheduled	Inspection Completed	Report Submitted
186	Haddington Shaft	4	40	8225	Clayton Road	5/21/2018	8/18/2018	Y	N	6/11/2018	7/10/2018	N	Refused	Y
187	Haddington Shaft	4	41	8225	Clayton Road Bridge	5/21/2018	8/18/2018	Y	N	N	N	8/10/2018	Y	Y
188	Haddington Shaft	4	N/A	822	Southside Drive	5/21/2018	8/18/2018	Y	N	6/11/2018	N	6/14/2018	Y	Y
189	Haddington Shaft	4	N/A	826	Southside Drive	5/21/2018	8/18/2018	Y	N	6/11/2018	N	7/19/2018	Partial (3 of 4 apartments)	Y
190	Haddington Shaft	4	N/A	833	Southside Drive	5/21/2018	8/18/2018	Y	N	6/11/2018	7/10/2018	10/9/2018	Y	Y
191	Haddington Shaft	4	N/A	8166	Whitman Drive	5/21/2018	8/18/2018	Y	N	6/11/2018	N	6/26-28, 7/5/18	Y	Y
192	Haddington Shaft	4	N/A	8400	Lowen Drive	5/21/2018	8/18/2018	Y	N	6/11/2018	7/10/2018	7/19/2018	Y	Y
193	Haddington Shaft	4	N/A	8401	Lowen Drive	5/21/2018	8/18/2018	Y	N	6/11/2018	7/10/2018	N	N	Y
194	Haddington Shaft	4	N/A	8402	Lowen Drive	5/21/2018	8/18/2018	Y	N	6/11/2018	7/10/2018	9/7/2018	Y	Y
195	Haddington Shaft	4	N/A	8403	Lowen Drive	5/21/2018	8/18/2018	Y	N	6/11/2018	7/10/2018	N	N	Y
196	Haddington Shaft	4	N/A	8413	Lowen Drive	5/21/2018	8/18/2018	Y	N	6/11/2018	7/10/2018	10/2/2018	Y	Y
197	Haddington Shaft	4	N/A	8416	Lowen Drive	5/21/2018	8/18/2018	Y	N	6/11/2018	7/10/2018	8/7/2018	Y	Y
198	Haddington Shaft	4	N/A	8417	Lowen Drive	5/21/2018	8/18/2018	Y	N	6/11/2018	N	6/26-27/18	Y	Y
199	Haddington Shaft	4	N/A	8423	Lowen Drive	5/21/2018	8/18/2018	Y	N	6/11/2018	7/10/2018	7/27/2018	Y	Y
200	Haddington Shaft	4	N/A	8510	Clayton Road	5/21/2018	8/18/2018	Y	N	6/11/2018	N	7/16-18/18	Y	Y
	Haddington Shaft	4	N/A	848-849	Southside Drive	5/21/2018	8/18/2018	NOT INCLUDED		6/7/2018	N	6/15/2018	Y	Y
	Haddington Shaft	4	N/A	848	Whitman Drive	5/21/2018	8/18/2018	NOT INCLUDED		6/7/2018	7/10/2018	N	N	Y
	Haddington Shaft	4	N/A	849	Lowen Drive	5/21/2018	8/18/2018	NOT INCLUDED		6/7/2018	7/10/2018	Called-will try	N	Y



Environmental Considerations

- Minimal, if any, impact to surrounding ecological systems



SAK Insurance Policy

- Amerisure Mutual Insurance Company
- Commercial General Liability Coverage, \$2 million each occurrence
- Umbrella Liability Coverage, \$5 million each occurrence



STL County Contact

Mike Burkemper

Commercial Land Disturbance and Blasting Inspections

41 South Central Avenue

Clayton MO 63105

Office 314-615-7130



SAK[™]

Pipeline Infrastructure. Solved.[™]

Questions?

Introduction

Project Overview

Blasting

Reporting

Questions



SAK[™]

Pipeline Infrastructure. Solved.™