

SCENE AWARENESS AND PROFESSIONAL COOPERATION

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Chief Deputy Fire Marshal
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&
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WHAT IS NATURAL GAS?

- A fossil fuel formed when layers of buried plants, gases and animals (Bio-Matter) are exposed to intense heat and pressure over thousands of years.
- A odorless flammable gas , consisting largely of methane and other hydrocarbons and used as a fuel.

WHATS THAT SMELL?

- BUTYL
MERCAPTAN
- First added to
gas in Germany
in the 1880's



WHAT IS AN EXPLOSION?

- The sudden conversion of potential energy (chemical or mechanical) into kinetic energy with the production and release of gases under pressure, or the release of gas under pressure.
- These high-pressure gases then do mechanical work, such as moving, changing, or shattering materials.

WHAT IS BLAST PRESSURE?

- The expanding leading edge of an explosion reaction.





5 BASIC GAS EMERGENCIES

- Major gas leak or line break
- Fires and Ignitions (Accidental or Human Act)
- Damage to gas equipment or facilities from compressors to pipe to meters to appliances
- Abnormal pressure
- Loss of service

WHAT LEADS TO EMERGENCIES?

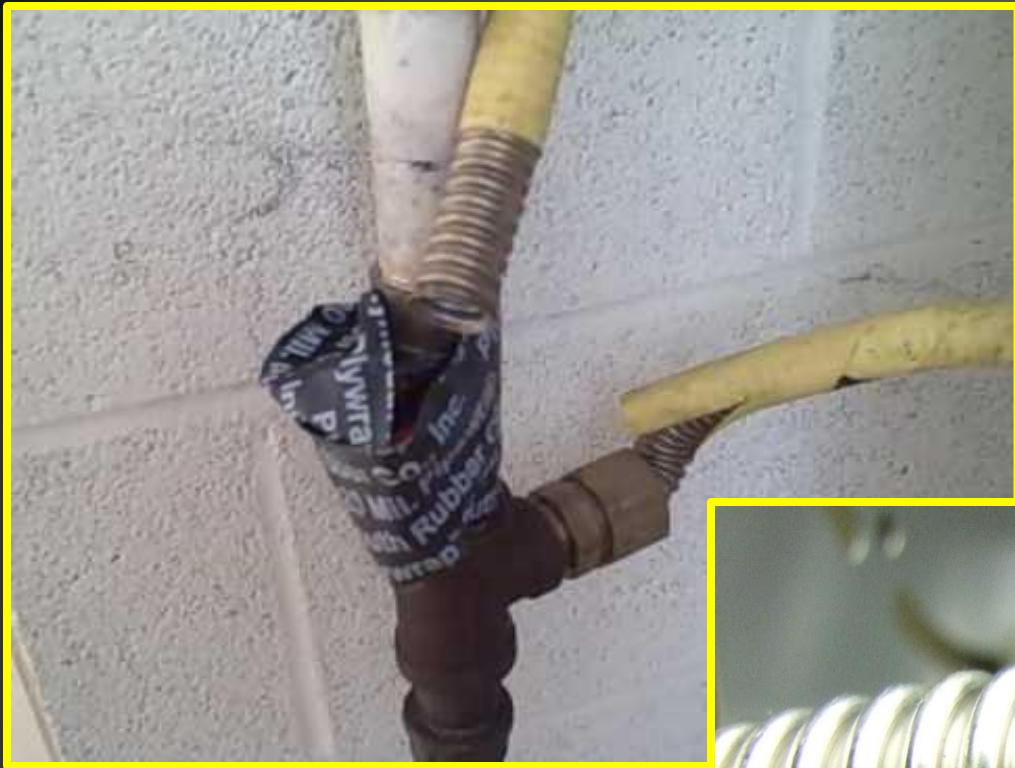
- Corrosion
- Line stress-pipe movement, improper installation, and earth movement, contractor
- Construction defects
- Mechanical failure
- Unsafe location for meter or regulator (i.e. vehicular damage)





HOLE

CLASSIFIED
CVD US



RECOGNIZING NATURAL GAS LEAKS

Warning signs can be seen, smelled, or heard

- Dead or dying vegetation over buried gas lines
- Unusual changes to soil –blackening, mildew, etc.
- Dry, blowing dirt near a gas line
- Bubbling water over a gas line
- Extensive corrosion on the meter set
- Unusual swarms of insects or piles of dead insects that may have been attracted to and killed by leaking gas



RECOGNIZING NATURAL GAS LEAKS

- Any suspected gas leak must be reported immediately
- **Call 911**



KC ALERTS

11/30/2017 07:34 EST -- (Allegheny, Bridgeville Borough - Low) Gas Line Struck / Active Leak, ID 77631,

Utility Emergency :: Underground utility

Chess St at Murray Ave in Bridgeville Borough a gas line was struck by a contractor & is leaking. Fire Department on scene, Peoples Gas notified. No unmet needs. #F170098204 West F Ops 3

08/02/2018 19:59 EST -- (Allegheny, Bridgeville Borough - Low) Natural Gas Leak w/Illness, ID 85910,

Hazardous Materials :: Natural gas release

119 Prestley Rd, Bridgeville PA 15017

The fire department is on scene at 119 Prestley Rd, Bridgeville, with an odor of natural gas in the residence that was called in direct to the fire station. Fire command is confirming a gas leak inside and they are in the process of isolating the source. EMS has been requested to evaluate 4 people with general sickness/vomiting. Columbia Gas has been notified and is enroute. No unmet needs. #F180064969 - West F Ops 3 #E180139213 - West EMS Disp #P180730235 - West PD Disp 1

Allegheny County 911 Center Stats

	FIRE								Total
	2012	2013	2014	2015	2016	2017	2018	Total	
08B1G	91	77	104	74	91	102	65	604	604
NGASCOM	294	296	348	340	328	330	182	2,118	2,118
NGASOUT	1,162	998	1,189	1,205	1,030	1,066	728	7,378	7,378
NGASRES	611	574	813	651	550	584	389	4,172	4,172
Total	2,158	1,945	2,454	2,270	1,999	2,082	1,364	14272	14272

08B1G = Gas Odor with Symptoms

NGASCOM = Natural Gas Odor Commercial Structure

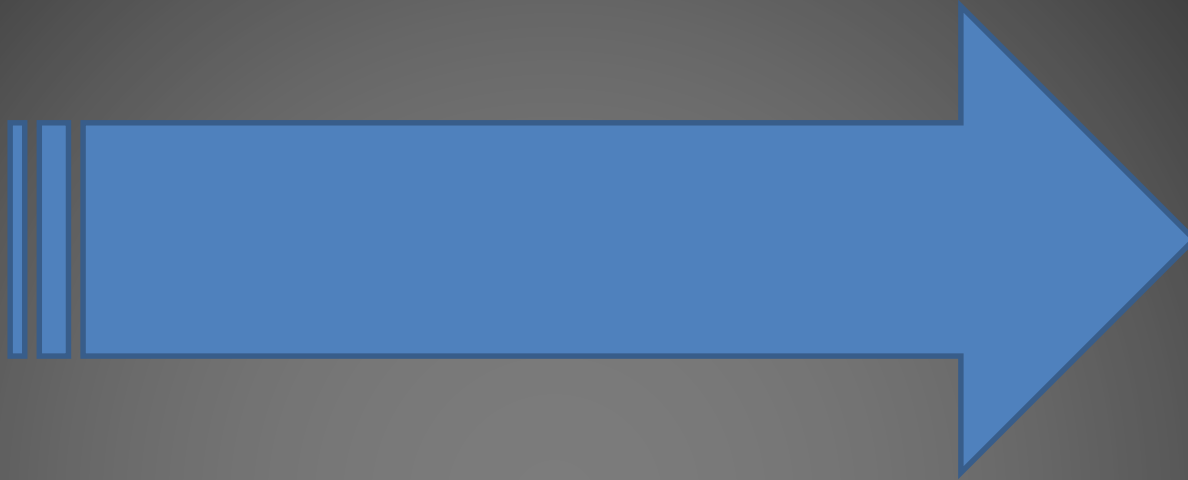
NGASOUT = natural Gas Odor Outside

NGASRES = Natural Gas Odor Residential Structure

RECOGNIZING NATURAL GAS LEAKS

- Recognizing gas leaks by sound
- If a gas leak is large enough, there may be a hissing sound coming out of the meter, connections, or from the ground.
- But hissing sounds at high-capacity sites could be normal due to the sound of gas going through the system.

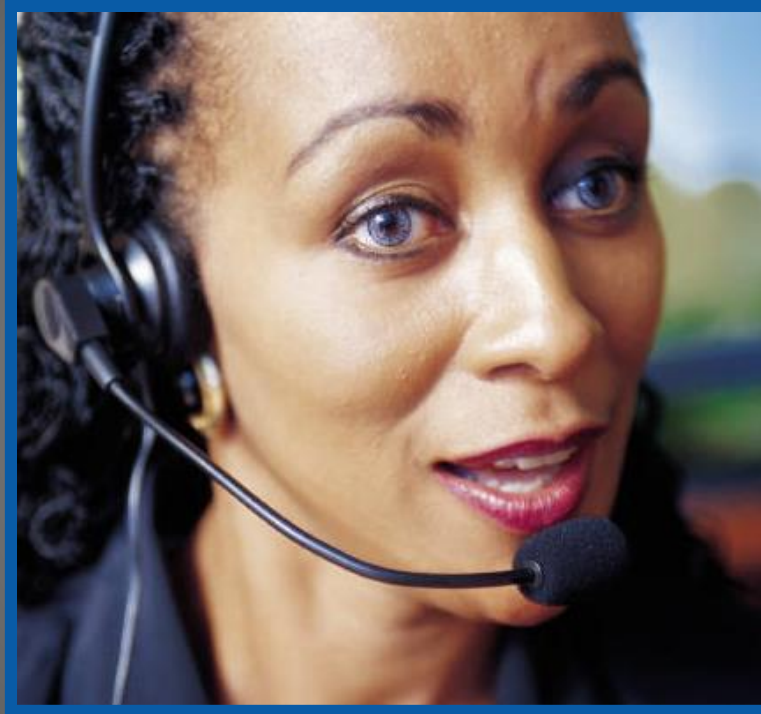




MOVING FORWARD

SCENE RESPONSE TO AN INCIDENT

A CALL TO 911



WAS IT A FIRE OR AN EXPLOSION?



WHO IS IN CHARGE OF THE SCENE? (Authority Having Jurisdiction - AHJ)

- When arriving to ANY emergency incident scene, you MUST make direct contact with the public official in charge
- Typically the Fire Chief (also referred to as the Incident Commander or I.C.)
- ALL responders report to the I.C.

WHO IS IN CHARGE OF THE INVESTIGATION AND WHERE?

- **ALLEGHENY COUNTY** = COUNTY FIRE MARSHAL & COUNTY POLICE
- **CITY OF PITTSBURGH** = PITTSBURGH FIRE/ARSON UNIT & CITY POLICE
- **STATE** = PENNSYLVANIA STATE POLICE FIRE MARSHAL

WE ALL REPORT TO THE I.C.

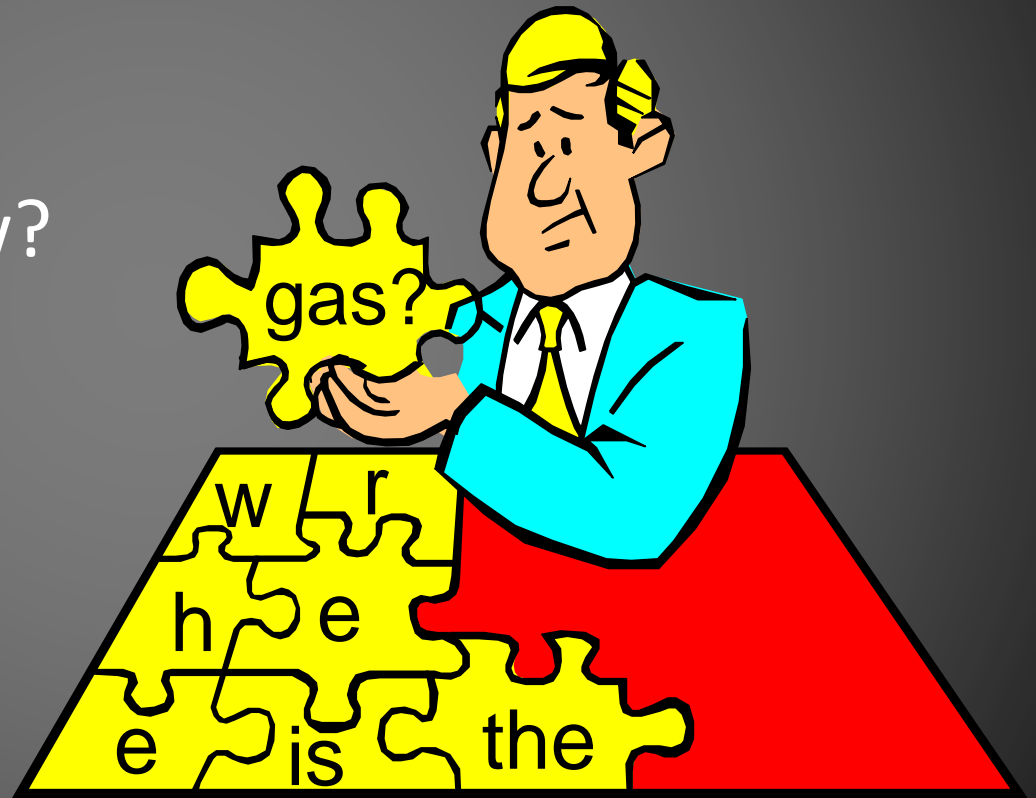
- LOCAL OFFICIALS (FIRE, POLICE & EMS)
- COUNTY FIRE MARSHAL & COUNTY POLICE
- PUBLIC UTILITY COMMISSION INVESTIGATORS
- ALL UTILITY COMPANY RESPONDERS

COMMUNICATION

- You must keep in direct communication with the Incident Commander & Fire Investigators
- Meet with Incident Commander and on scene fire investigators to review known facts
- Report back to the fire officials routinely

INFORMATION GATHERING

- Where is the gas?
- What do we know?
- Any injuries?
- Who reported?



SCENE SAFETY

- IS THE SCENE SECURED
- IS THE GAS FLOW SECURED
- IS THE ELECTRIC POWER SECURED
- ARE OTHER SOURCES OF IGNITION SECURED
- FIRE DEPARTMENT AIR MONITORING

SECURE IGNITION SOURCES

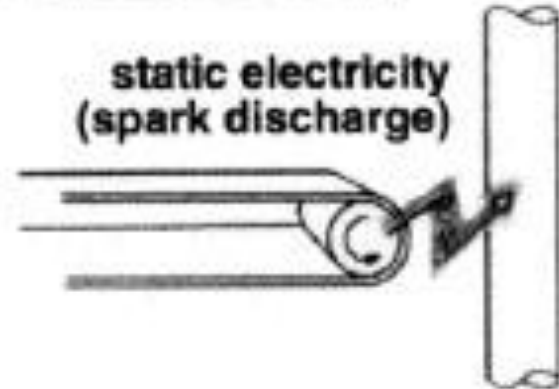
**fire, flames,
smoldering material**



hot surfaces



**static electricity
(spark discharge)**



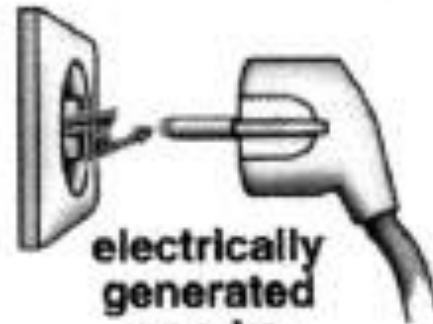
**mechanically
generated
sparks**



**static
electricity
(brush
discharge)**



**electrically
generated
sparks**



Static Electricity Concern



Fire Department Hose Clamp



From $\frac{3}{4}$ " up
to 12"

SCENE CONSIDERATIONS

- HOW MANY STRUCTURES ARE INVOLVED
- EVACUATION
- MIGRATION
- CHECKING UNDERGROUND VAULTS/SEWERS AND OTHER STRUCTURES

TYPES OF NATURAL GAS EXPLOSIONS

- High Order Explosion - a rapid pressure rise or high-force explosion characterized by shattering effect of the confining structure or container and long missile distance i.e. ripping & shredding.
- Low Order Explosion - a slow rate of pressure rise or low force explosion characterized by pushing or dislodging effect on the confining structure and short missile distance i.e. pushing & shoving.

HIGH ORDER = 3200 FT. PER SEC.+



LOW ORDER EXPLOSION = LESS THAN
3200 FT. PER SEC.



DO NOT TOUCH

- KEEPS HANDS OFF ANY ITEM OR EQUIPEMENT UNTIL PERMISSION IS GIVEN
- JUST BECAUSE YOU OWN IT DOES NOT MAKE IT YOURS
- IF IT NEEDS TOUCHED, WEAR GLOVES



ISOLATING THE PROBLEM AS A TEAM

- BAR HOLE TESTING
- AIR MONITORING
- SHUT OFF GAS METER
- SECURE CURB BOX
- LINE PRESSURE TESTING

CASE STUDY #1 – Moon Twp.

- MARCH 16, 2005 @ 3:14PM
- SUNNY / COOL 45 DEGREES
- SUBCONTRACTOR DIRECTIONAL BORING NEAR DRIVEWAY CONTACTED PLASTIC GAS LINE
- GAS COMPANY OFFICIAL ON SCENE PRIOR TO EXPLOSION
- EXPLOSION RESULTING IN TWO CRITICAL INJURIES

AERIAL VIEW



EFFORTS MADE TO CONTROL GAS FLOW FLOW – LINE PINCH



INVOLVED DRILL RIG



GATHERING INFORMATION



LOOKING FOR THE LEAK



FINDING THE LEAK



DOCUMENT THE LEAK



MIGRATION PATH



CONCLUSION

- THOROUGH INVESTIGATION
- GOOD TEAMWORK
- GREAT DOCUMENTATION & INTERVIEWS
- SUCCESSFUL CIVIL LITIGATION
- IMPORTANCE OF NOTIFYING PA-ONE-CALL (811)

CASE STUDY #2 – Plum Borough

- MARCH 5, 2008 @ 1:39PM
- CLOUDY / COLD 35 DEGREES
- GRANDFATHER AND GRANDDAUGHTER RETURN HOME FROM PRE-SCHOOL
- EXPLOSION RESULTING WITH ONE CRITICAL INJURY AND ONE FATALITY

PRE INCIDENT PHOTOGRAPH



1238K00177000000

POST INCIDENT PHOTOGRAPH



POST INCIDENT PHOTOGRAPH



UNSECURED GAS FLOW

AERIAL VIEW



LOCATING THE LEAK



DOCUMENTING THE LEAK



SECURING LEAK SITE ON PIPE



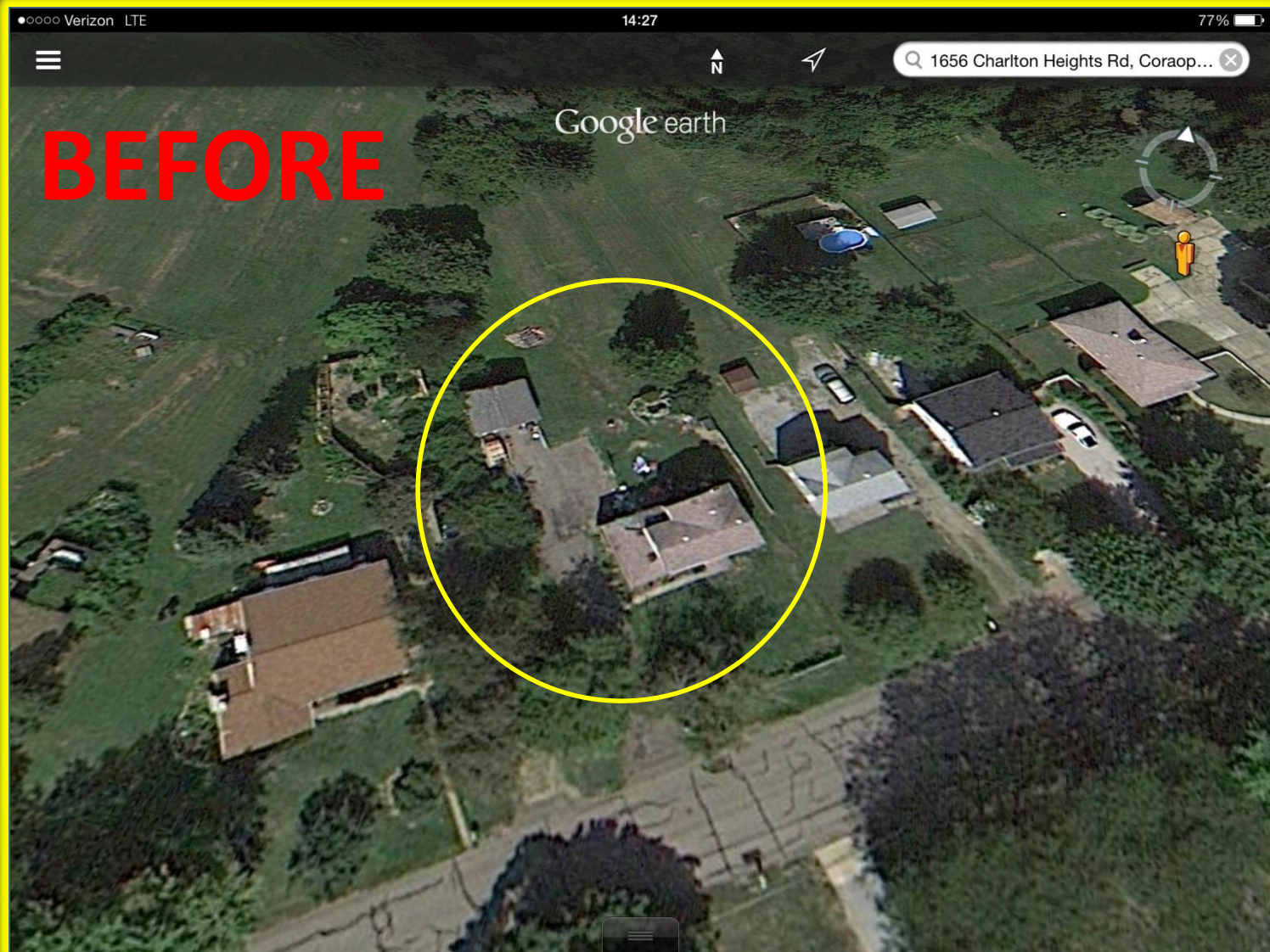
CONCLUSION

- THOROUGH INVESTIGATION
- SEWER LINE WORK CONDUCTED 4 YEARS PRIOR TO INCIDENT
- DIRECT CONTRACTOR INVOLVEMENT
- SUCCESSFUL CIVIL LITIGATION

CASE STUDY #3 – Moon Twp.

- OCTOBER 12, 2013 @ 6:44PM
- CLEAR / MILD 60 DEGREES
- OCCUPIED BY ONE MALE

MOON TWP. EXPLOSION



MOON TWP. EXPLOSION



AFTER DEBRIS REMOVAL



F.D. ASSISTANCE



LOCAL D.P.W. ASSISTANCE



GAS COMPANY ASSISTANCE



INVESTIGATION

- HOMEOWNER CRIMINALLY CHARGED
- 13 HOMES DAMAGED
- FOUND GUILTY OF ARSON – 10 YEARS IN PRISON

*Communication is the key
to a successful outcome.*

*Our positive action
combined with positive
thinking results in success.*



**Know what's below.
Call before you dig.**

QUESTIONS

