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Energy Answers.

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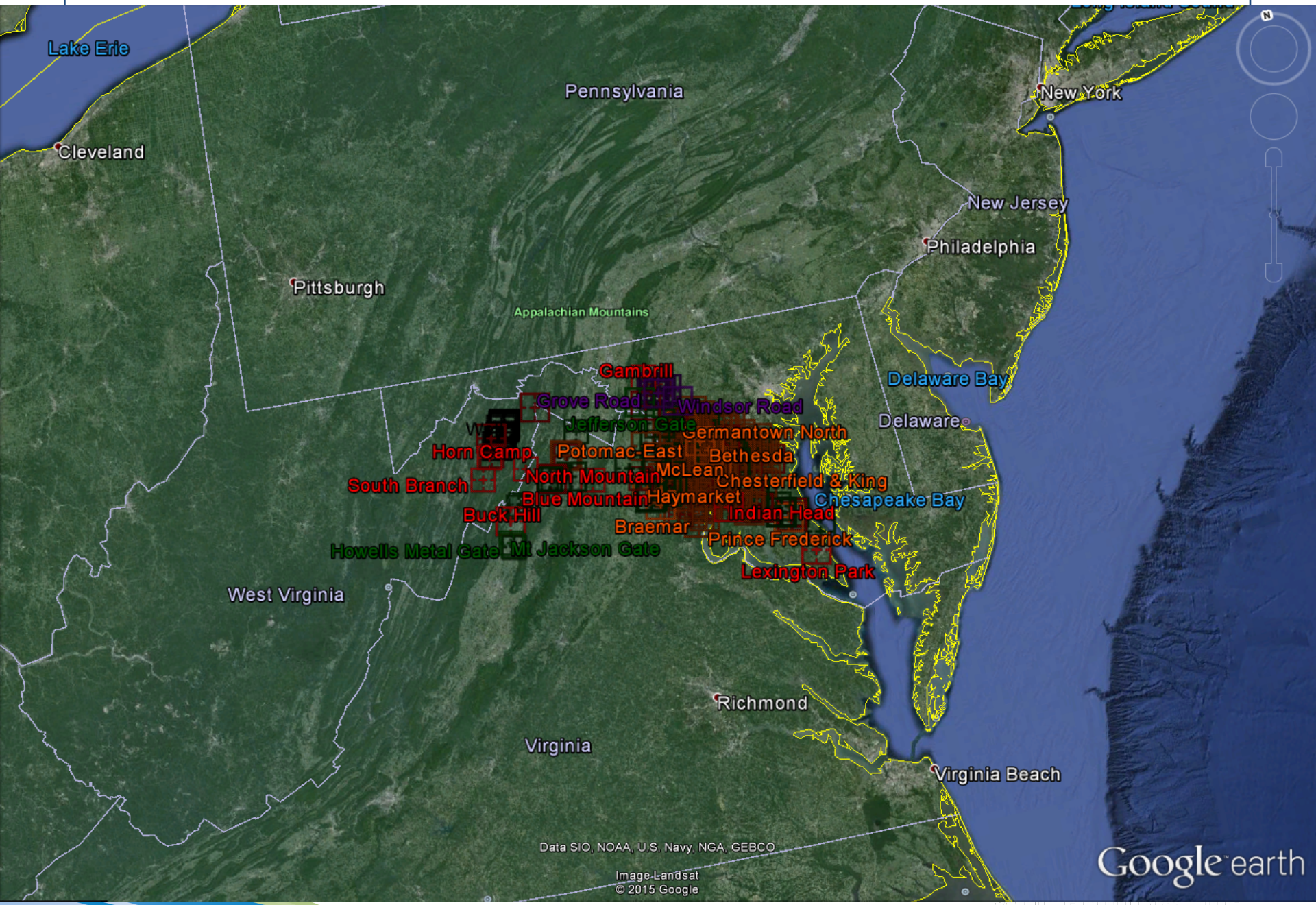
# CRAIG LIGHTNER

# SUPERVISOR AUTOMATION AND CONTROL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New Jersey
Philadelphia
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Windsor Road
Jefferson Gate
Germantown North
Delaware Bay
Delaware
Horn Camp
Potomac-East
Bethesda
McLean
North Mountain
Chesterfield & King
South Branch
Blue Mountain
Haymarket
Chesapeake Bay
Buck Hill
Indian Head
Braemar
Prince Frederick
Howells Metal Gate
Mt Jackson Gate
Lexington Park
West Virginia
Richmond
Virginia
Virginia Beach
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image Landsat
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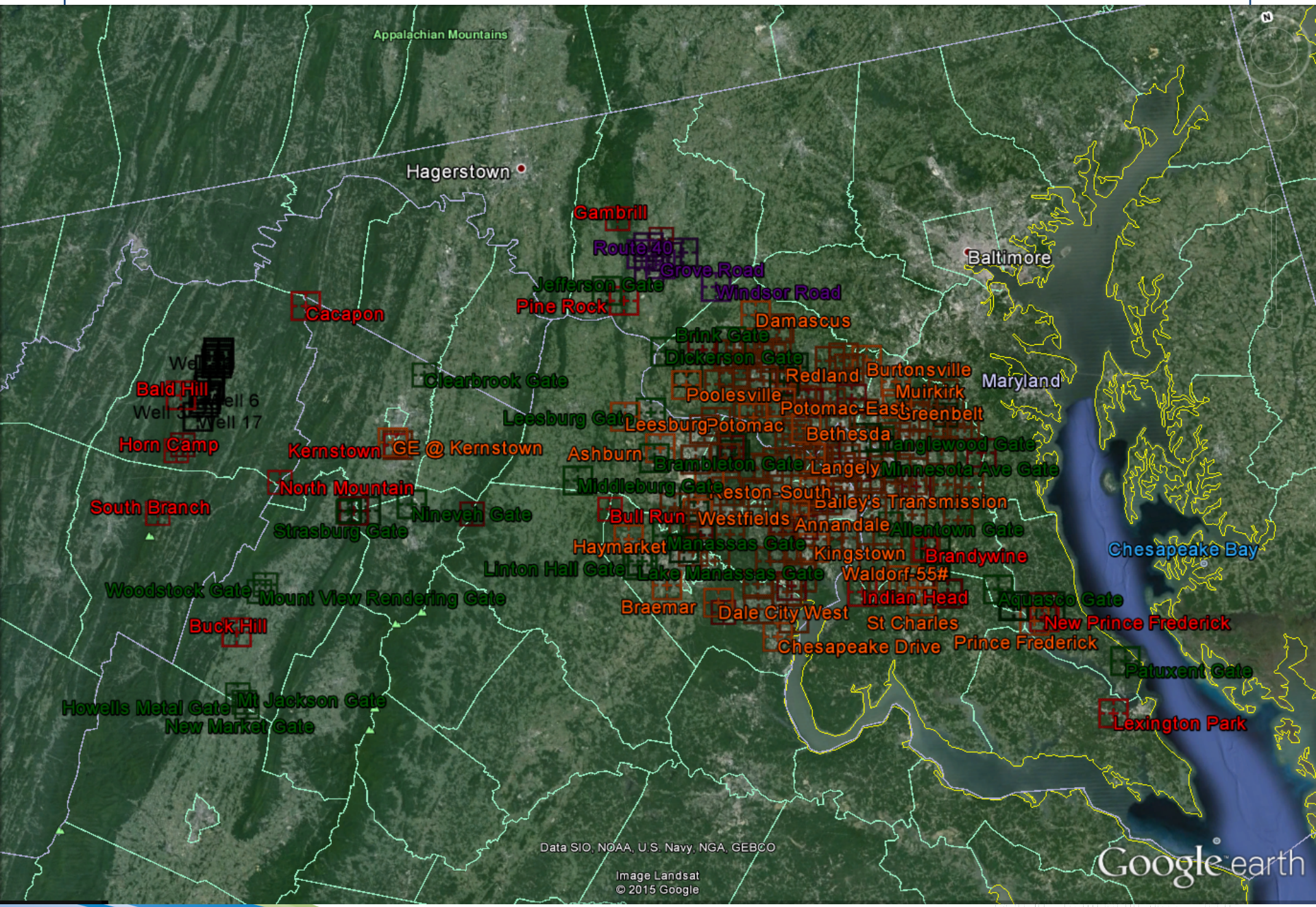
Appalachian Mountains
Hagerstown
Gambrill
Route 40
Grove Road
Windsor Road
Jefferson Gate
Pine Rock
Cacapon
Baltimore
Damascus
Brink Gate
Dickerson Gate
Clearbrook Gate
Redland
Burtonsville
Maryland
Bald Hill
Well 6
Well 17
Poolesville
Muirkirk
Potomac-East
Greenbelt
Leesburg Gat
Leesburg
Potomac
Bethesda
Horn Camp
Kernstown
GE @ Kernstown
Ashburn
Brambleton Gate
Langely
Minnesota Ave Gate
North Mountain
Middleburg Gate
Reston-South
Bailey's Transmission
South Branch
Nineveh Gate
Bull Run
Westfields
Annandale
Allentown Gate
Strasburg Gate
Haymarket
Manassas Gate
Kingstown
Brandywine
Chesapeake Bay
Linton Hall Gate
Lake Manassas Gate
Waldorf-55#
Woodstock Gate
Mount View Rendering Gate
Indian Head
Aquasco Gate
Braemar
Dale City West
St Charles
New Prince Frederick
Buck Hill
Chesapeake Drive
Prince Frederick
Patuxent Gate
Howells Metal Gate
Mt Jackson Gate
New Market Gate
Lexington Park
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image Landsat
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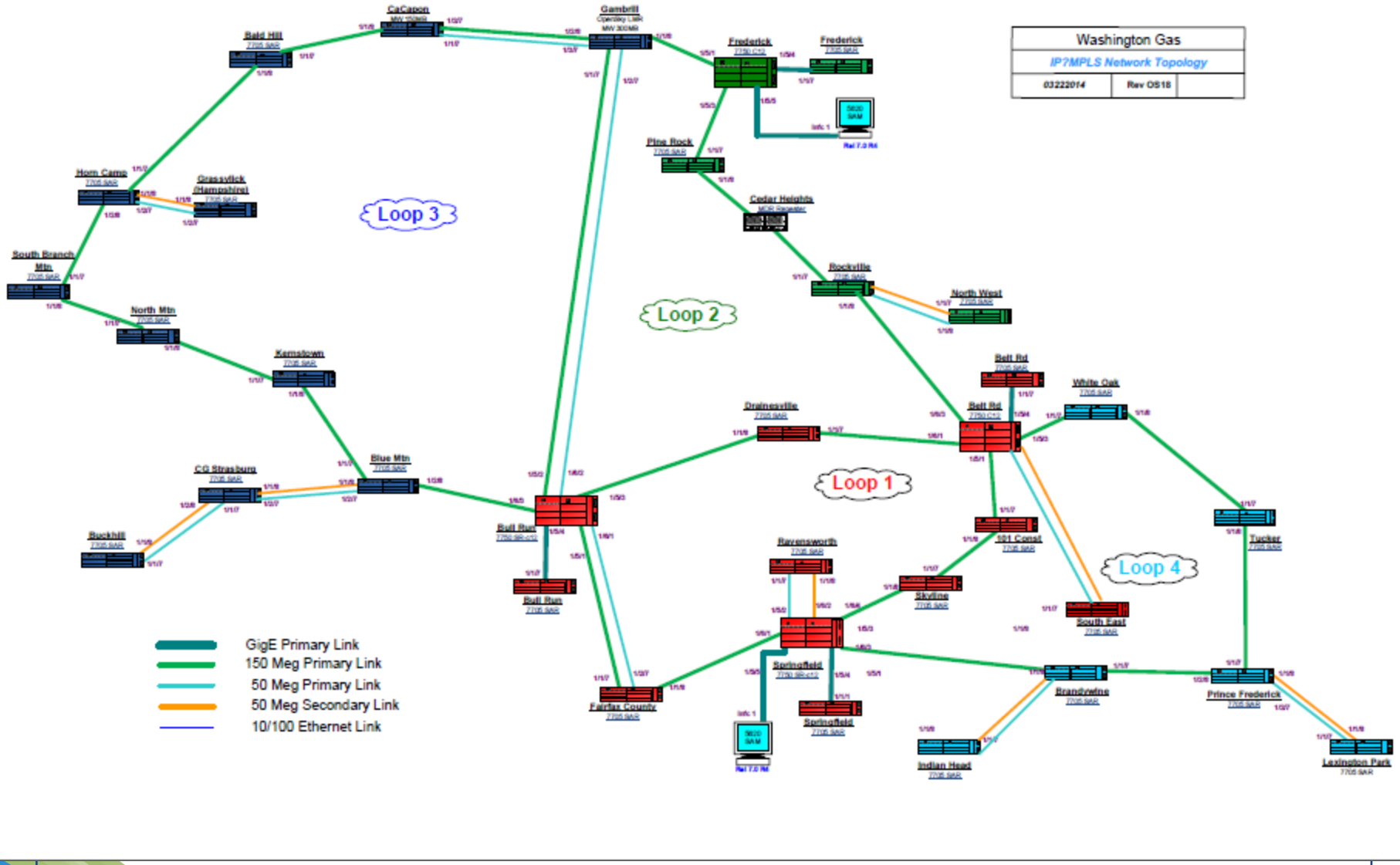


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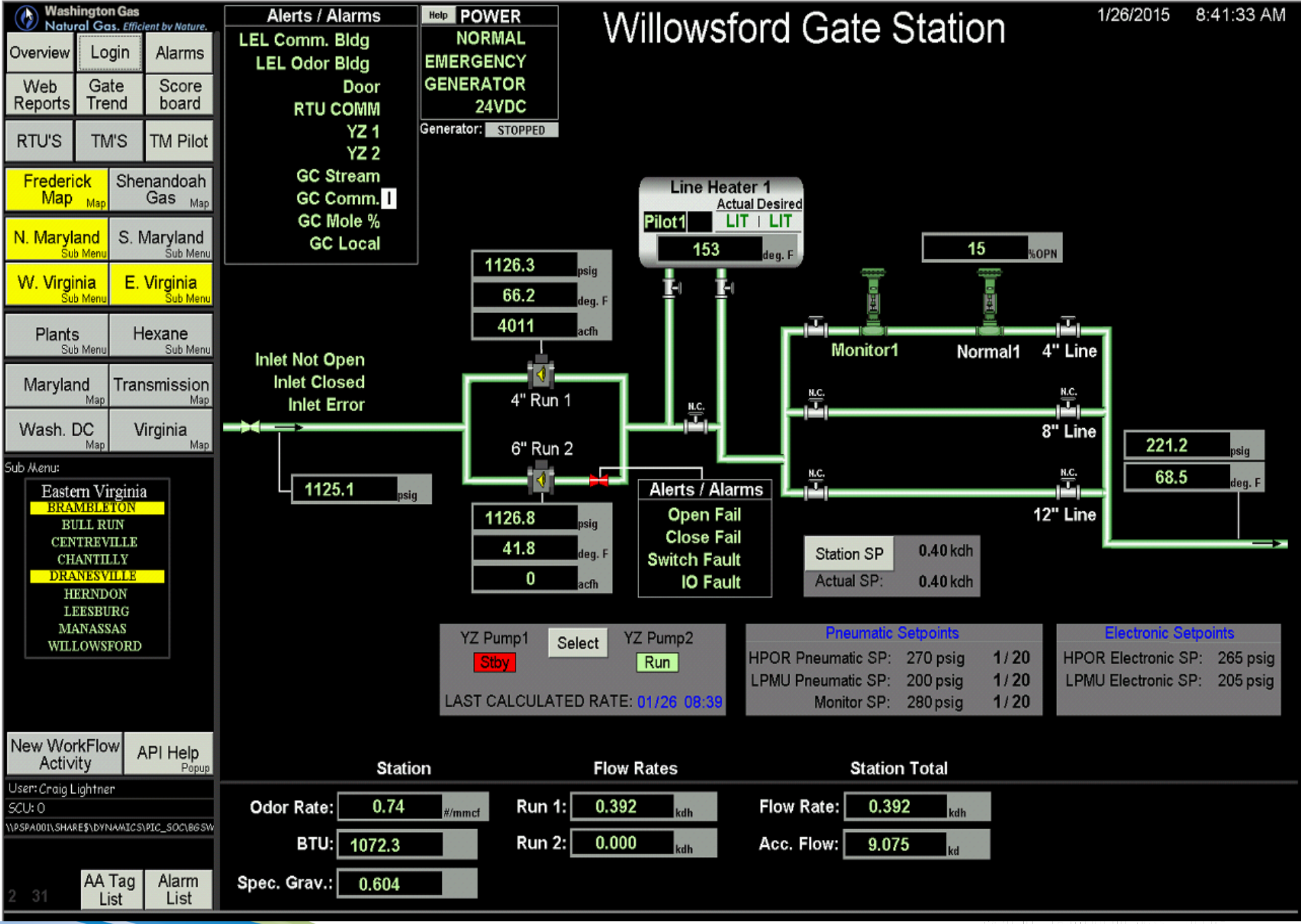
# Types of Natural Gas Companies

- Gas Production
  - Well Head Production, Landfill Production, Fracking Production
- Gas Transportation
  - Interstate Pipelines
- Gas LDC
  - Local Distribution Company


Washington Gas
Natural Gas. Efficient by Nature.
Overview
Login
Alarms
Web Reports
Gate Trend
Score board
RTU'S
TM'S
TM Pilot
Frederick Map
Shenandoah Gas
N. Maryland Sub Menu
S. Maryland Sub Menu
W. Virginia Sub Menu
E. Virginia Sub Menu
Plants Sub Menu
Hexane Sub Menu
Maryland Map
Transmission Map
Wash. DC Map
Virginia Map
Sub Menu:
Eastern Virginia
BRAMBLETON
BULL RUN
CENTREVILLE
CHANTILLY
DRANESVILLE
HERNDON
LEESBURG
MANASSAS
WILLOWSFORD
New WorkFlow Activity
API Help Popup
User: Craig Lightner
SCU: 0
\\PSPA001\SHARE$\DYNAMICS\PIC_SOC\BGSW
2 31
AA Tag List
Alarm List
Alerts / Alarms
LEL Comm. Bldg
LEL Odor Bldg
Door
RTU COMM
YZ 1
YZ 2
GC Stream
GC Comm.
GC Mole %
GC Local
Help
POWER
NORMAL
EMERGENCY
GENERATOR
24VDC
Generator: STOPPED
Willowsford Gate Station
1/26/2015 8:41:33 AM
Line Heater 1
Actual Desired
Pilot1
LIT LIT
153 deg. F
15 %OPN
1126.3 psig
66.2 deg. F
4011 acfh
Inlet Not Open
Inlet Closed
Inlet Error
4" Run 1
6" Run 2
1125.1 psig
1126.8 psig
41.8 deg. F
0 acfh
N.C.
Monitor1
Normal1
4" Line
8" Line
12" Line
221.2 psig
68.5 deg. F
Alerts / Alarms
Open Fail
Close Fail
Switch Fault
IO Fault
Station SP 0.40 kdh
Actual SP: 0.40 kdh
YZ Pump1
Stby
Select
YZ Pump2
Run
LAST CALCULATED RATE: 01/26 08:39
Pneumatic Setpoints
HPOR Pneumatic SP: 270 psig 1/20
LPMU Pneumatic SP: 200 psig 1/20
Monitor SP: 280 psig 1/20
Electronic Setpoints
HPOR Electronic SP: 265 psig
LPMU Electronic SP: 205 psig
Station
Odor Rate: 0.74 #/mmcf
BTU: 1072.3
Spec. Grav.: 0.604
Flow Rates
Run 1: 0.392 kdh
Run 2: 0.000 kdh
Station Total
Flow Rate: 0.392 kdh
Acc. Flow: 9.075 kd

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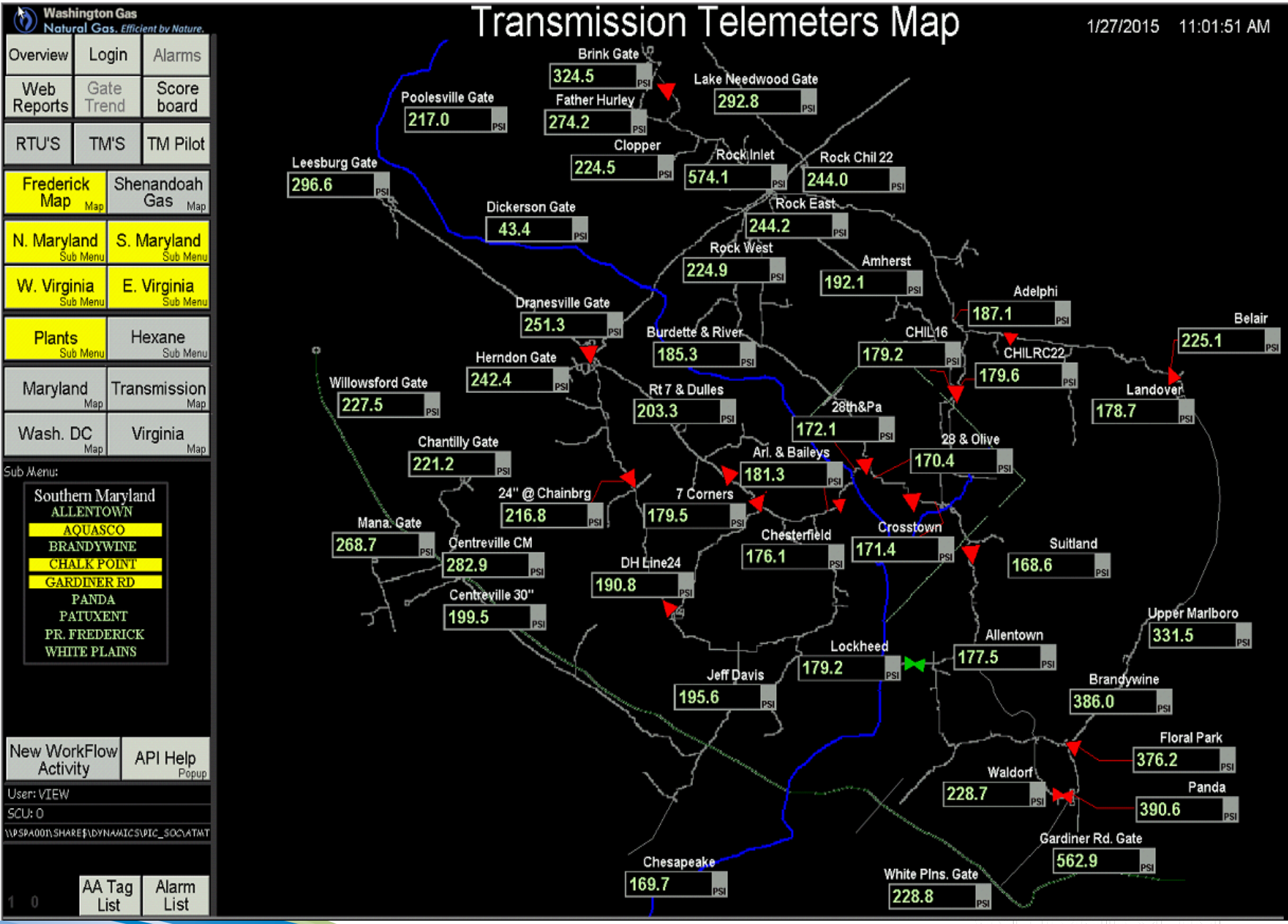
# Redundancy of Service

- Our product is our energy source
  - It powers our generators
  - It powers our pneumatic backup systems
- Pipes are looped much like a communication ring network
- We maintain an independent pressure monitoring system not connected to our ICS network


Washington Gas
Natural Gas. Efficient by Nature.
Transmission Telemeters Map
1/27/2015 11:01:51 AM
Overview
Login
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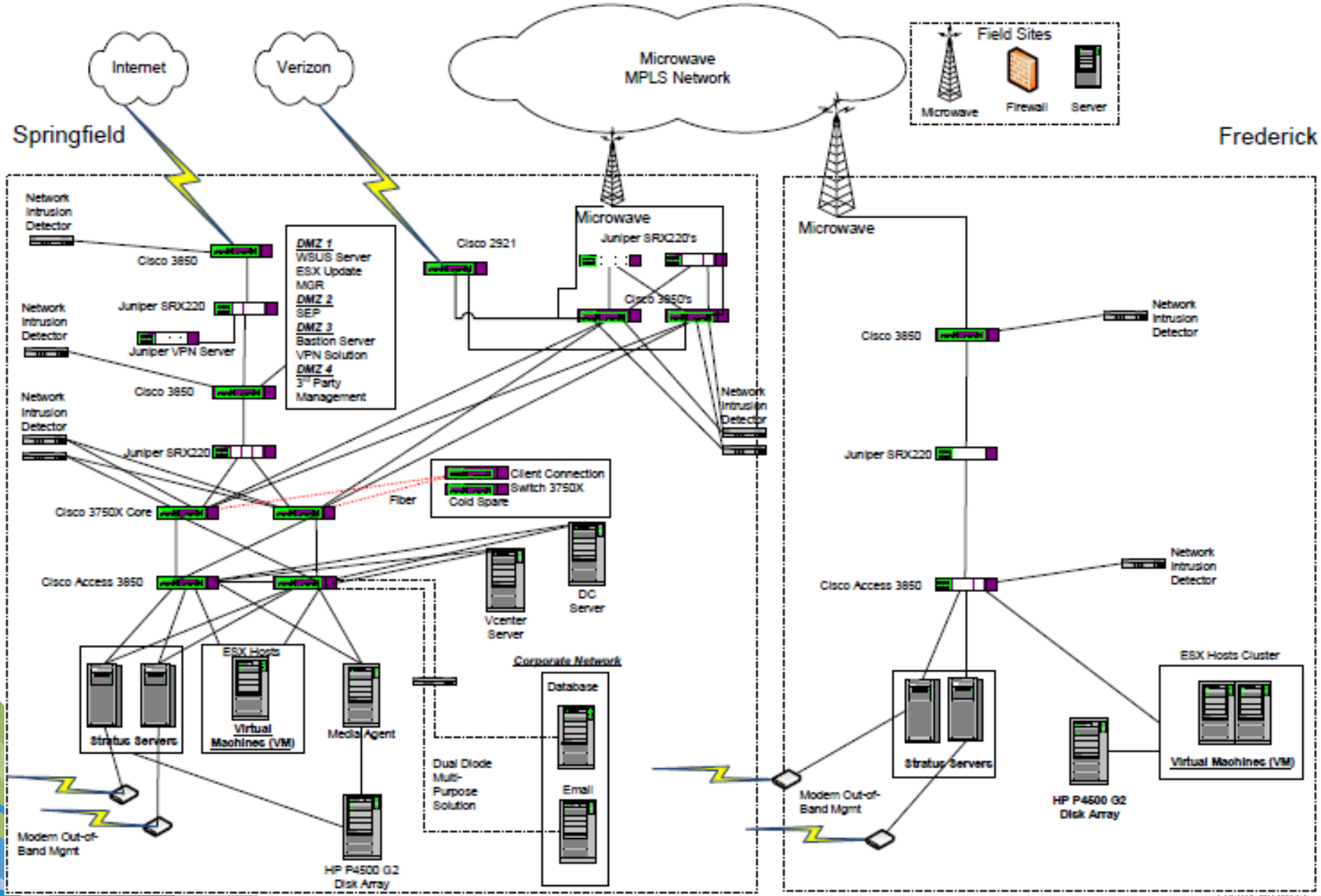
TM'S
TM Pilot
Frederick Map Map
Shenandoah Gas Map
N. Maryland Sub Menu
S. Maryland Sub Menu
W. Virginia Sub Menu
E. Virginia Sub Menu
Plants Sub Menu
Hexane Sub Menu
Maryland Map
Transmission Map
Wash. DC Map
Virginia Map
Sub Menu:
Southern Maryland
ALLENTOWN
AQUASCO
BRANDYWINE
CHALK POINT
GARDINER RD
PANDA
PATUXENT
PR. FREDERICK
WHITE PLAINS
New WorkFlow Activity
API Help Popup
User: VIEW
SCU: 0
\\PSPA001\SHARE$\DYNAMICS\PIC_SOC\ATMT
AA Tag List
Alarm List
Brink Gate 324.5 PSI
Lake Needwood Gate 292.8 PSI
Poolesville Gate 217.0 PSI
Father Hurley 274.2 PSI
Clopper 224.5 PSI
Rock Inlet 574.1 PSI
Rock Chil 22 244.0 PSI
Leesburg Gate 296.6 PSI
Dickerson Gate 43.4 PSI
Rock East 244.2 PSI
Rock West 224.9 PSI
Amherst 192.1 PSI
Adelphi 187.1 PSI
Belair 225.1 PSI
Dranesville Gate 251.3 PSI
Burdette & River 185.3 PSI
CHIL16 179.2 PSI
CHILRC22 179.6 PSI
Herndon Gate 242.4 PSI
Willowsford Gate 227.5 PSI
Rt 7 & Dulles 203.3 PSI
28th&Pa 172.1 PSI
Landover 178.7 PSI
Chantilly Gate 221.2 PSI
Arl. & Baileys 181.3 PSI
28 & Olive 170.4 PSI
24" @ Chainbrg 216.8 PSI
7 Corners 179.5 PSI
Mana. Gate 268.7 PSI
Centreville CM 282.9 PSI
Chesterfield 176.1 PSI
Crosstown 171.4 PSI
Suitland 168.6 PSI
DH Line24 190.8 PSI
Centreville 30" 199.5 PSI
Upper Marlboro 331.5 PSI
Allentown 177.5 PSI
Lockheed 179.2 PSI
Jeff Davis 195.6 PSI
Brandywine 386.0 PSI
Floral Park 376.2 PSI
Waldorf 228.7 PSI
Panda 390.6 PSI
Gardiner Rd. Gate 562.9 PSI
Chesapeake 169.7 PSI
White Plns. Gate 228.8 PSI
Diversity
Innovation
Service
Sustainability
Performance


Internet
Verizon
Microwave
MPLS Network
Field Sites
Microwave
Firewall
Server
Springfield
Frederick
Network Intrusion Detector
Cisco 3850
DMZ 1
WSUS Server
ESX Update MGR
DMZ 2
SEP
DMZ 3
Bastion Server
VPN Solution
DMZ 4
3rd Party Management
Juniper SRX220
Juniper VPN Server
Cisco 2921
Microwave
Juniper SRX220's
Cisco 3850's
Network Intrusion Detector
Juniper SRX220
Client Connection Switch 3750X
Cold Spare
Fiber
Cisco 3750X Core
Cisco Access 3850
Vcenter Server
DC Server
ESX Hosts
Virtual Machines (VM)
Stratus Servers
Media Agent
Corporate Network
Database
Email
Dual Diode Multi-Purpose Solution
Modem Out-of-Band Mgmt
HP P4500 G2 Disk Array
Microwave
Network Intrusion Detector
Cisco 3850
Juniper SRX220
Cisco Access 3850
ESX Hosts Cluster
Virtual Machines (VM)
Stratus Servers
Modem Out-of-Band Mgmt
HP P4500 G2 Disk Array

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23

# Entities Vying to Regulate the Natural Gas Industry

DHS – Department of Homeland Security

CFATS - Chemical Facility Anti-Terrorism Standards (DHS Subcommittee)

DOE – Department of Energy

DOT – Department of Transportation (Regulates transportation pipelines)

FERC – Federal Energy Regulatory Commission (Regulates transportation pipelines, an Administration under DOT)

# Entities Vying to Regulate the Natural Gas Industry

PHMSA – Pipeline and Hazardous Material Safety Administration (Regulates ALL Natural Gas Control Rooms, an Administration under DOT)

NERC - North American Electric Reliability Corporation (Regulates the Electric Industry, CIP standards)

TSA – Transportation Security Administration

PSC – Public Service Commissions

AGA – American Gas Association

# Methods Employed for Security

1. Network Isolation
2. Staff Support (On Site, Vetted)
3. NO Unescorted Remote Access
4. NO file transport into the infrastructure
5. Sanitized transport out of the infrastructure
6. NO Wireless communications
7. Daily virus signatures

# Methods Employed for Security

8. Monthly OS patching
9. Quarterly ICS patching
10. Encrypted MW and RF traffic
11. VPN tunnel and Certified Application Traffic
12. Event and traffic logging with analysis
13. Failover to the backup system monthly
14. Practice ICP quarterly

# Methods Employed for Security

15. Practice BCP annually
16. Practice Regional Simulations with External Resources (Fire, Police, Other Gas Companies, FBI, DHS, Vendors, etc.) semi-annually

# Challenges

1. We have a Large Territory with exposed infrastructure
2. We are concerned about the supply chain
3. We are concerned about insider capabilities
4. We are concerned about penetration testing of the production network

# Questions