



Coal Mining Datasets of National Significance

National Meeting
of
SMCRA Geospatial Data Stewards

Warwick Hotel
1776 Grant Street
Denver, CO 89293

Benny R. Wampler, Deputy Director
VA Dept. of Mines, Minerals and Energy

Tuesday, June 27, 2006



Overview

- ✦ Introduction to VA DMME
- ✦ Geospatial Activities and Achievements
- ✦ Importance of Geospatial Datasets
- ✦ Stewardship and Coal Mining Datasets of National Significance



DMME's Mission

"We enhance the development and conservation of energy and mineral resources in a safe and environmentally sound manner to support a more productive economy."



Who We Are

- DMME was created in 1985 to consolidate scattered and - at that time - ineffective activities for the mineral and energy businesses into one coordinated agency providing efficient and effective services that could be directed to the needs of our primary customers.



DMME Programs and Services

- ☀ Division of Mined Land Reclamation
- ☀ Division of Mines
- ☀ Division of Mineral Mining
- ☀ Division of Gas and Oil
- ☀ Division of Mineral Resources
- ☀ Division of Energy
- ☀ Administrative Support Group



Geospatial Activities at DMME Support Programs and Services

- 🚧 (SMCRA) Permitting Process
- 🚧 Field Inspection
- 🚧 AML
- 🚧 Complaint Investigations
- 🚧 Geologic Mapping
- 🚧 Renewable Energy Resources
- 🚧 Customer Information Request
- 🚧 Emergency Response
- 🚧 Economic Development Efforts





Importance of Geospatial Activity at DMME

Planning

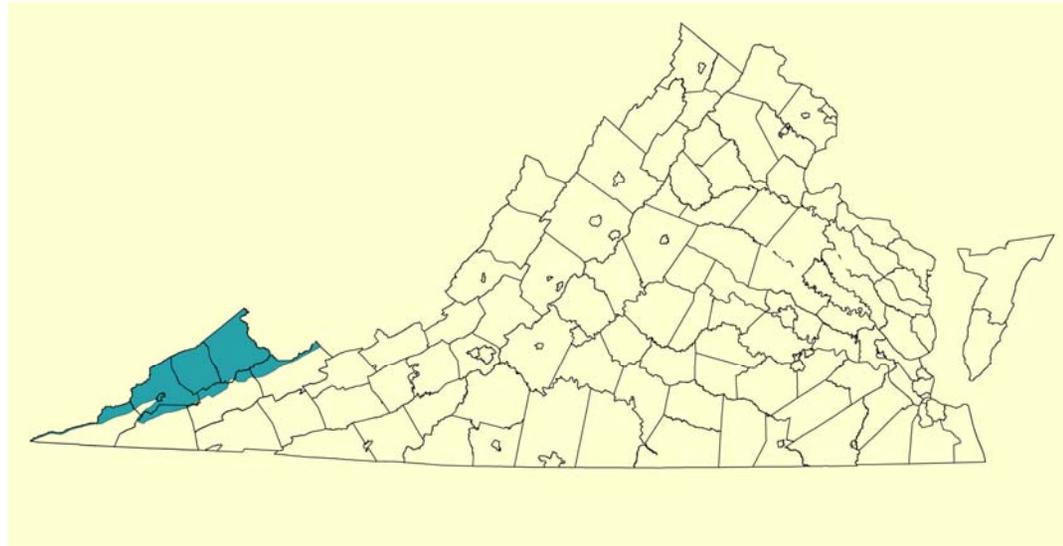
- Geospatial activities are included in strategic and operation planning
- Inclusion into business model
- Understanding the importance of creating, maintaining, and sharing spatial data

Digital Mapping Workgroup (DMWG)

- Consist of members from all Divisions of the agency
- Purpose is to coordinate agency geospatial development



Southwest Virginia Coalfield



- **The Southwest Virginia Coalfield includes an area of approximately 1,520 square miles and seven counties; Lee, Scott, Wise, Russell, Dickenson, Buchanan, and Tazewell.**
- **The Southwest Virginia Coalfield is presently the sole source of the state's coal production.**
- **Coal is Virginia's most valuable mineral resource.**



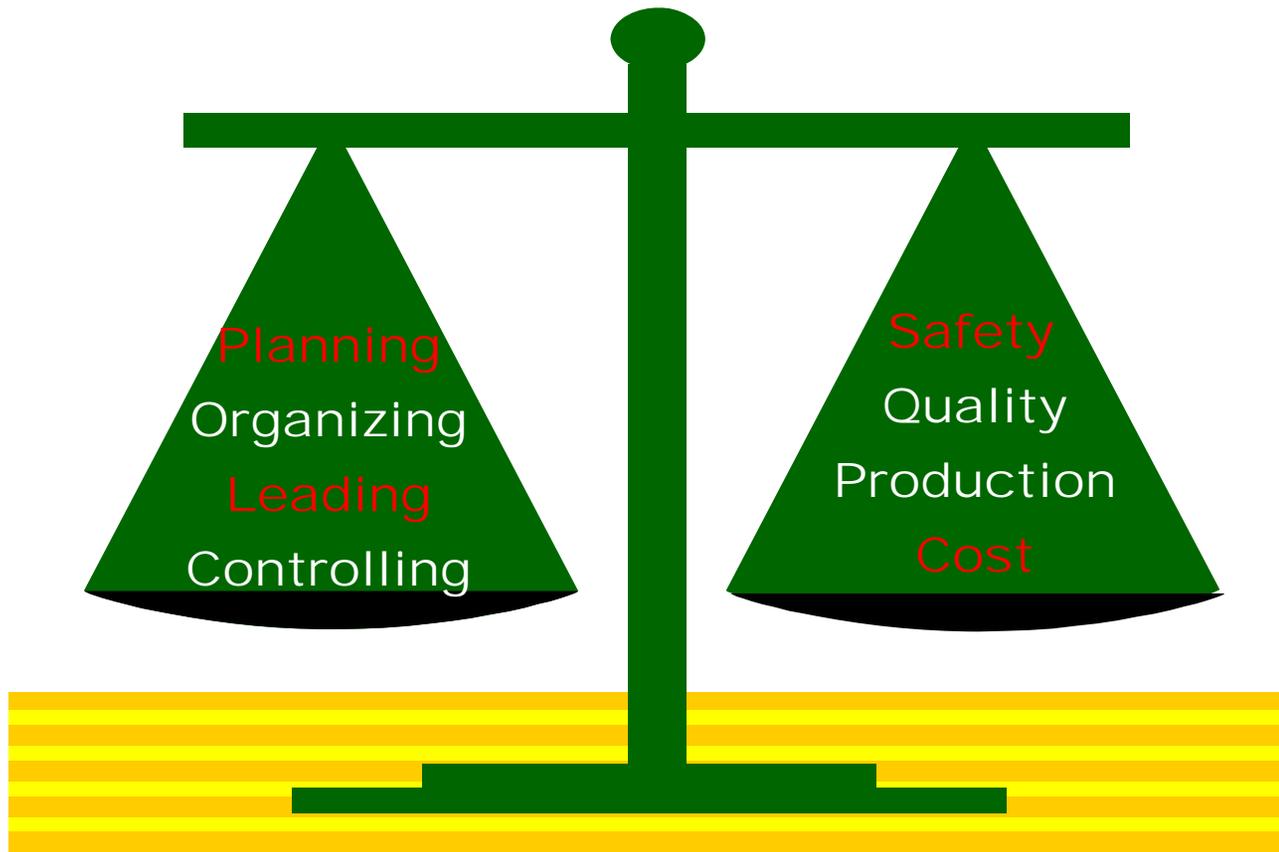
Coal & Geospatial Technology

Energy demands for coal and clean coal technology continue to impact public policy, resource development, enforcement, and operational processes.

Broad application, continued development, sharing and disbursement of Geospatial Data Technologies is key in sound policy for global competitiveness, public awareness, environmental compliance, worker safety, and wise development of our natural resources.



Geospatial Datasets Play a Key Role in a Balanced Business or Agency Environment



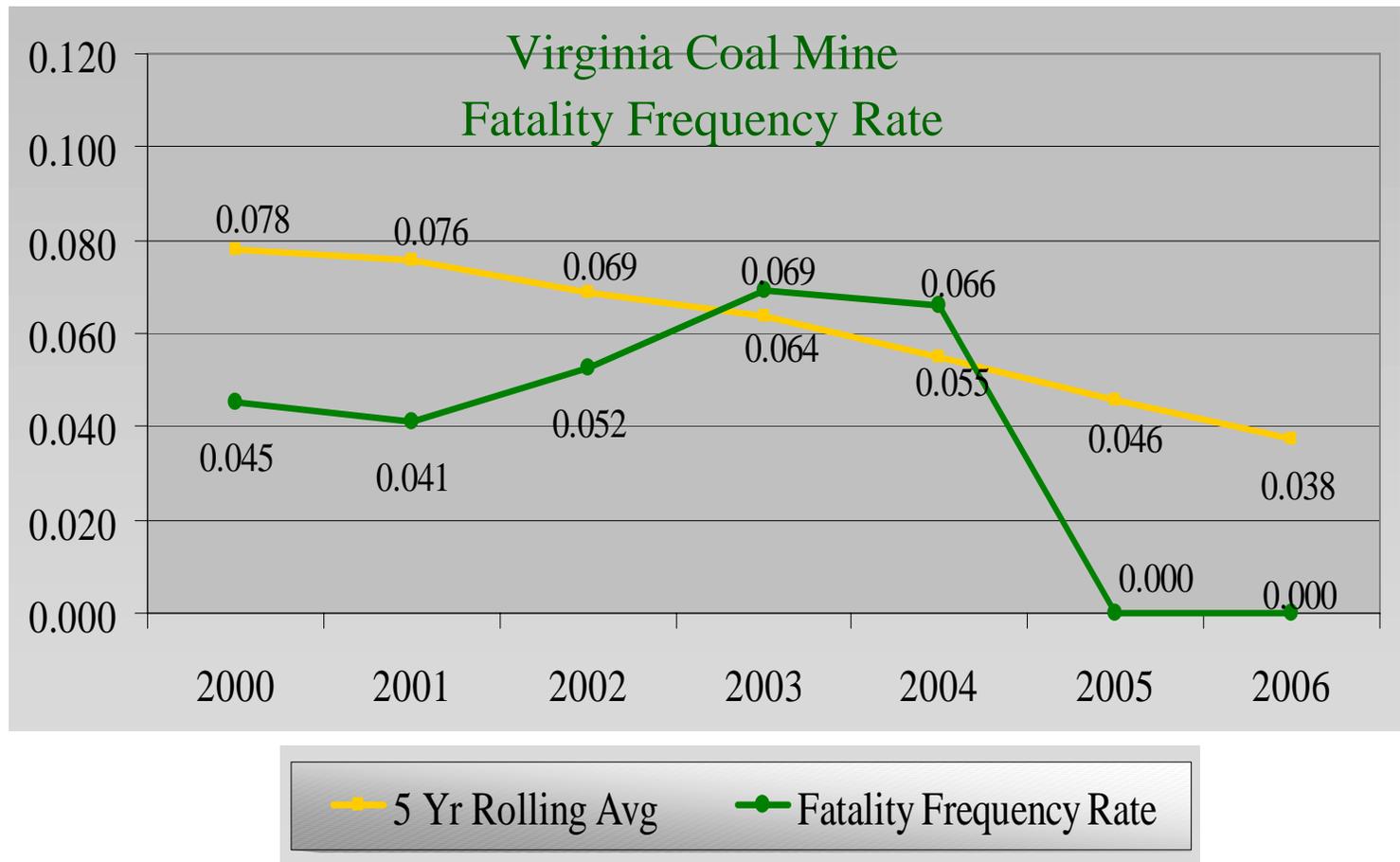


Continued development of Geospatial Datasets can promote:

- Public safety and the separation of public and private dwellings from mining activities.
- The prevention of mine inundations and water or natural gas blowouts.
- Mine subsidence issues.
- Mine specific and timely enforcement mapping and mine information.



Geospatial Datasets Support Mine Safety Efforts





Geospatial Datasets are utilized for evaluation and identification of viable resource development:

- Risk potential and assessments can be created
- Economic viability for development determined
- Infrastructure development within coalfield communities can be supported
- Agency resources can be efficiently and effectively allocated
- Support agency goals and objectives for the safe and productive mining of mineral resources



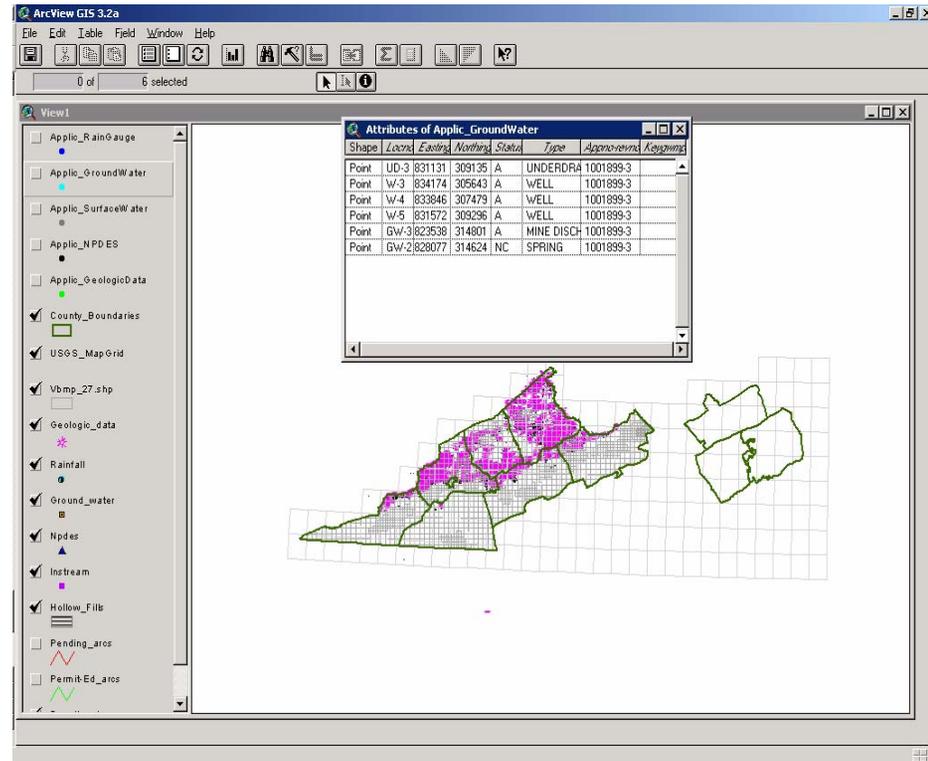
Division of Mines current utilization of Geospatial Datasets:

- Emergency Response Plans for Mine Emergencies
- Emergency Notification and Evacuation-impoundments
- Gas Well and Transmission Lines
- Refuse, Impoundments, and Slurry Cells
- Abandoned Works and Mine Mapping
- Off-Site Impacts from Mining



SMCRA Geospatial Datasets at Virginia DMME/DMLR

- 1994 TIPS ArcInfo Workstation – began digitizing of permit boundaries
- Other datasets followed – proposed mining limits, underground mine outlines, geo-referenced mine maps, water monitoring, geology, hollow fills, digital basemaps, orthophotography, etc.





Sharing of Geospatial Datasets at DMME

- ✦ Multi-functioning geo-datasets used across divisions and agency-to-agency
- ✦ Past and present extraction activities and their spatial relationships – gas wells, surface mining, underground mining
- ✦ Electronic submittal of maps and mapping features (DMLR's Electronic Permitting Application)



Mapping Systems and Applications

- ✦ Electronic Permitting (EP) Mapping Application
- ✦ Laptop Systems – Field Inspector Mapping and Information Systems
- ✦ Underground Mine Mapping – VAMAP & the Virginia Coal Mine and Mine Map Inventory System
- ✦ Web-Based Map Information Delivery (MapGuide Application)
- ✦ Mapping for Safety – Spatial relationship of past and present extraction activities (gas wells & pipelines, underground mines, surface mines)



EP Mapping

- ✚ Facilitates decision-making and expedites review process
- ✚ Increases analytical capabilities of reviewer
- ✚ Provides a platform for direct comparison of applicant and agency data
- ✚ Location-based information
 - Coordinate pairs to map features
- ✚ Historic record keeping of geographic information associated with each permit
- ✚ Enhanced data exchange capabilities
- ✚ Provides opportunity to incorporate information otherwise impossible to use with hardcopy maps



Electronic Application

The screenshot displays the Dmlr Viewer application window. The title bar reads "Dmlr Viewer". The interface includes a navigation toolbar with "Back", "Forward", "Prev", "Next", and "Up" buttons. A file tree on the left lists folders for application 1001899, including "Appl 1001899 - P1" and "Appl 1001899 - E1". The "Appl 1001899 - E1" folder is expanded, showing a list of sections from I to XXI, such as "GENERAL INFORMATION", "ADMINISTRATIVE INFORMATION", "SITE INFORMATION", "GEOLOGY", "HYDROLOGY", "PHC/HRP", "LAND USE", "FISH AND WILDLIFE", "SOILS AND REVEGETATION", "OPERATIONS PLAN", "DRAINAGE CONTROL", "SEDIMENT CONTROL", "BACKFILLING/GRADING", "EXCESS MATERIALS DISPOSAL", "TOXIC MATERIALS AND NON-C", "BLASTING", "TRANSPORTATION PLAN", "UNDERGROUND CONTROL", "BONDING", "SPECIAL CATEGORIES", and "VERIFICATIONS/CERTIFICATION". The main content area is currently empty. At the bottom, there is an "Application Guide:" section with a scrollable area. Below this are buttons for "Exit", "Word", "Done", "Map", "Insp.", and "Info". The version number "Ver. 2.0.2" is displayed. The footer contains the application ID "1001899 - 3" and a record status string: "Recd: 9/21/2004 Out:10/20/2004 JAC Status: TR5-9/22/2004 TSS() PRB() CJS() DXK() SBM(N) GFB(N)". At the bottom right, there are buttons for "Attachments" and "History".



Applicant Data

- 👉 Monitoring Points
- 👉 Maps –Application, Revision, Renewal, Geology, SWH, etc.
- 👉 Map Features
- 👉 Data Formats – flexibility
- 👉 Required Layers
- 👉 Application Guide & Help
- 👉 Data Consistency
- 👉 Viewers



Monitoring Point Locations

Dmlr Viewer

Back Forward Prev Next Up

- Appl 1001899 - P1
 - Appl 1001899 - E1
 - I GENERAL INFORMATION
 - II ADMINISTRATIVE INFORMAT
 - III SITE INFORMATION
 - IV GEOLOGY
 - V HYDROLOGY
 - 5.1 WATERSHED/RECEIVII
 - 5.2 PROPOSED PERMIT AF
 - 5.3 LOCATIONS OF GROUND**
 - 5.4 GROUND WATER INVE
 - 5.5 GROUND WATER BASE
 - 5.6 GROUND WATER MON
 - 5.7 LOCATIONS OF SURFAI
 - 5.8 SURFACE WATER INVE
 - 5.9 SURFACE WATER BASI
 - 5.10 SURFACE WATER MO
 - 5.11 CLIMATOLOGICAL BAS
 - 5.12 CLIMATOLOGICAL MO
 - 5.13 REFERENCE DATA
 - 5.14 ALTERNATE WATER S
 - 5.15 POLLUTION DISCHAR
 - 5.16 ALTERNATE PROPOS.
 - VI PHC/HRP
 - VII LAND USE
 - VIII FISH AND WILDLIFF

5.3 LOCATIONS OF GROUND WATER MONITORING POINTS

Add Delete Details Cancel Save

Action	MPID No.	Loc. No.	Code	Type	Frequency	Elevation
A	0005010	UD-3	UD	UNDERDRAIN	6	1770
A	0005011	W-3	WE	WELL	6	1660
A	0005012	W-4	WE	WELL	6	1670
A	0005013	W-5	WE	WELL	6	1720
A	0005015	GW-3	MD	MINE DISCH	6	1770
A		GW-2	SP	SPRING	6	1700

Add Delete Details Cancel Save

Attachments (0)

Description	File Name/Path

Application Guide:
The data download will list points for an existing permit.

Utilizing the Details screen note any Action taken (**A = add, C = change, D = delete**) and list the location number, elevation, VA South State Plane Northing and Easting Coordinates (NAD 27) for all monitoring points.

Ver. 2.0.2

Exit Word Done

Map Inspr. Info

1001899 - 3

Recd: 9/21/2004 Out:10/20/2004 JAC Status: TRS-9/22/2004 TSS() PRB() CJS() DXK() SBM(N) GFB(N)

Example WORD Attachments History



Applicant Data Entry

Locations of Ground Water Monitoring Points

Action	MPID No	Type - UD	Frequency
<input type="button" value="A"/>	0005010	UNDERDRAIN	6
Loc. No.	Elevation	Facility Location	Status
UD-3	1770	FILL 3	A
Quad Name - 0510	Northing	Easting	
POUND	309135	831131	
Comment	<input type="text"/>		



Digital Maps in Application

Dmlr Viewer

Back Forward Prev Next Up

21.2 MAPS/CERTIFICATIONS History

Add Delete Details Cancel Save

Attachments (21)

Description	File Name/Path
CORPS ENVIRNMENTAL RESOURCES MAP	C:\unzipped\POWERDEEP3\ENVIRONMENT
STREAM RE-CONSTRUCTION POWERS	C:\unzipped\POWERDEEP3\POWERSTREA
▶ APPLICATION MAP	C:\unzipped\POWERDEEP3\POWDPAPP.dwg
RELINQUISHMENT MAP(1101822)	C:\unzipped\POWERDEEP3\1822RELMAP.d
GEOLOGY AND MONITORING MAP	C:\unzipped\POWERDEEP3\POWDMGEOM
GEOLOGY SECTIONS A_B	C:\unzipped\POWERDEEP3\GEODECAB.dwg
SURFACE WATER HYDROLOGY MAP	C:\unzipped\POWERDEEP3\POWDPSPWH.d
POND NO. 1	C:\unzipped\POWERDEEP3\POWERP1.dwg
POND NO. 2	C:\unzipped\POWERDEEP3\POWERP2.dwg
POND NO. 3	C:\unzipped\POWERDEEP3\POWERP3.dwg
SITE PLAN AND SECTIONS	C:\unzipped\POWERDEEP3\POWDMSITE.d
EXISTING FILL NO.3'S DRAWING	C:\unzipped\POWERDEEP3\POWERF3.dwg
ROAD DRAWING_DETAILS	C:\unzipped\POWERDEEP3\POWERDRMOA

Application Guide:
Attach appropriate maps and certifications in (or immediately following if paper) this section as Attachment(s) 21.2. The original signed maps should be submitted hard copy with an electronic version attached in this section.

MAP REQUIREMENTS

1001899 - 3

Recd: 9/21/2004 Out:10/20/2004 JAC Status: TRS-9/22/2004 TSS() PRB() CJS() DXK() SBM(N) GFB(N)

Example WORD Attachments History

Exit Word Done

Map Inspr. Info

Ver: 2.0.2



GIS Permit Data Provided by Applicant

Dmlr Viewer

Back Forward Prev Next Up

- II ADMINISTRATIVE INFORMATION
- III SITE INFORMATION
- IV GEOLOGY
- V HYDROLOGY
- VI PHC/HRP
- VII LAND USE
- VIII FISH AND WILDLIFE
- IX SOILS AND REVEGETATION
- X OPERATIONS PLAN
- XI DRAINAGE CONTROL
- XII SEDIMENT CONTROL
- XIII BACKFILLING/GRADING
- XIV EXCESS MATERIALS DISPOSAL
- XV TOXIC MATERIALS AND NOISE
- XVI BLASTING
- XVII TRANSPORTATION PLAN
- XVIII UNDERGROUND CONTROL
- XIX BONDING
- XX SPECIAL CATEGORIES
- XXI VERIFICATIONS/CERTIFICATIONS
- XXII VERIFICATION(S)/CERTIFICATION
- 21.1 VERIFICATION(S)/CERTIFICATION
- 21.2 MAPS/CERTIFICATION
- 21.3 APPLICATION COMMENTARY
- 21.4 MAP LEGEND
- 21.5 POINT DATA**

21.5 GIS Permit Data

Add Delete Details Cancel Save

Attachments (1)	
Description	File Name/Path
SEE EXTRACTION MAP	C:\unzipped\POWDERDEEP3\EXTRACTION

Application Guide:

DMLR Electronic Permitting Data Extraction Requirements

Type	Data	Layer Name	Data Type	Line
------	------	------------	-----------	------

1001899 - 3

Recd: 9/21/2004 Out:10/20/2004 JAC Status: TRS-9/22/2004 TSS() PRB() CJS() DXK() SBM(N) GFB(N)

Example WORD Attachments History



Technical Reviewer Access to Custom Mapping Application with Applicant Data

Dmlr Viewer

Back Forward Prev Next Up

- Appl 1001899 - P1
- Appl 1001899 - E1
 - I GENERAL INFORMATION
 - II ADMINISTRATIVE INFORMATION
 - III SITE INFORMATION
 - IV GEOLOGY
 - V HYDROLOGY
 - VI PHC/HRP
 - VII LAND USE
 - VIII FISH AND WILDLIFE
 - IX SOILS AND REVEGETATION
 - X OPERATIONS PLAN
 - XI DRAINAGE CONTROL
 - XII SEDIMENT CONTROL
 - XIII BACKFILLING/GRADING
 - XIV EXCESS MATERIALS DISPOSAL
 - XV TOXIC MATERIALS AND NON-C
 - XVI BLASTING
 - XVII TRANSPORTATION PLAN
 - XVIII UNDERGROUND CONTROL
 - XIX BONDING
 - XX SPECIAL CATEGORIES
 - XXI VERIFICATIONS/CERTIFICATI

Exit Word Ver: 2.0.2 Done

Map Insp. Info

1001899 - 3

Application Guide:

Recd: 9/21/2004 Out:10/20/2004 JAC Status: TRS-9/22/2004 TSS() PRB() CJS() DXX() SBM(N) GFB(N)

Attachments History



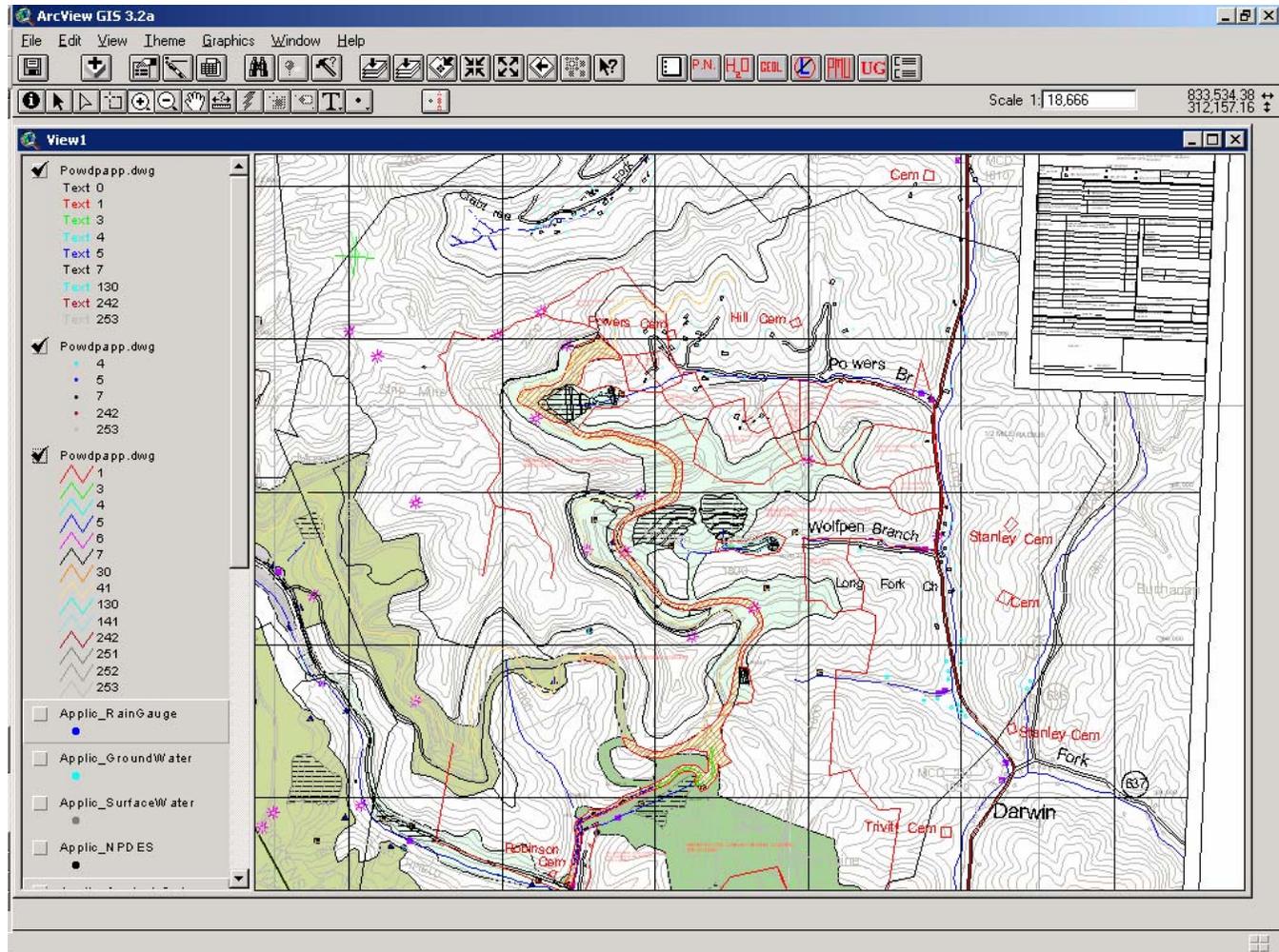
Application Data with Attributes

The screenshot shows the ArcView GIS 3.2a interface. The main map area displays a grid overlay on a map of Virginia, with several areas highlighted in pink. The left sidebar shows a list of data layers, including 'Applic_RainGauge', 'Applic_GroundWater', 'Applic_SurfaceWater', 'Applic_NPDES', 'Applic_GeologicData', 'County_Boundaries', 'USGS_MapGrid', 'Vbmp_27.shp', 'Geologic_data', 'Rainfall', 'Ground_water', 'Npdes', 'Instream', 'Hollow_Fills', 'Pending_arcs', and 'Permit_Ed_arcs'. The 'Attributes of Applic_GroundWater' table is open, showing the following data:

Shape	Locnd	Eastng	Northng	Status	Type	Appno-revnd	Keygwmd
Point	UD-3	831131	309135	A	UNDERDRA	1001899-3	
Point	W-3	834174	305643	A	WELL	1001899-3	
Point	W-4	833846	307479	A	WELL	1001899-3	
Point	W-5	831572	309296	A	WELL	1001899-3	
Point	GW-3	823538	314801	A	MINE DISCH	1001899-3	
Point	GW-2	828077	314624	NC	SPRING	1001899-3	



Using Applicant's Digital Maps in GIS





From Paper to Digital

- 🔦 Applicant submittal of digital data has led to:
 - More efficient extraction of permittee geospatial data
 - Capturing more data with same manpower
 - More accurate data in shorter turn-around time





VAMAP

- ❖ Completing a comprehensive digital collection of an estimated 43,000 mine maps of southwestern Virginia's 54 mineable coal seams by collecting, scanning, digitally cataloging, and geo-referencing all available mine maps and digitizing extents of the mine works
- ❖ Establish web-based information delivery targeted to coal mining companies, gas well operators, DMME staff, and other state and federal regulatory agencies



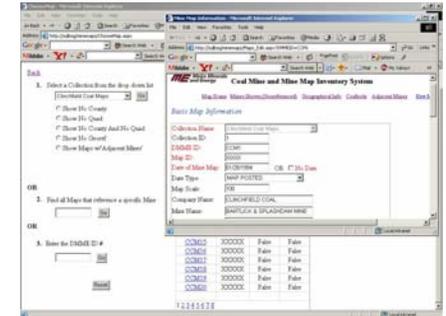
VAMAP Process



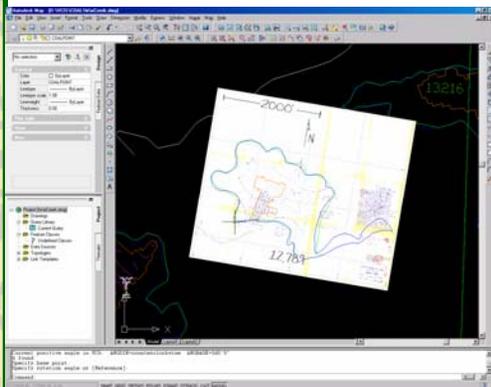
Collect



Scan



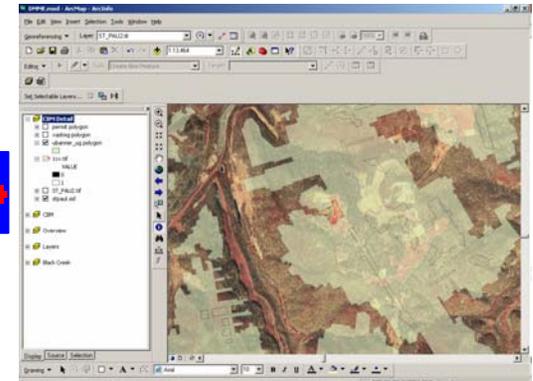
Catalog



Geo-Reference



Mine-Info

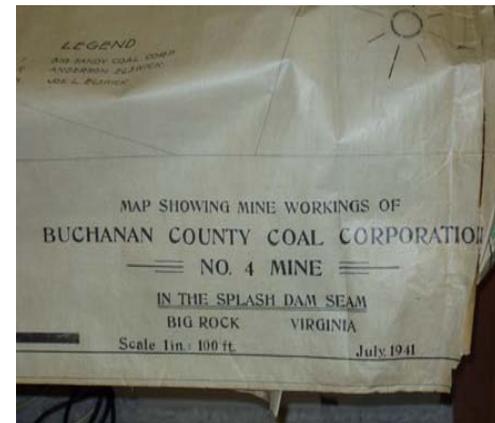


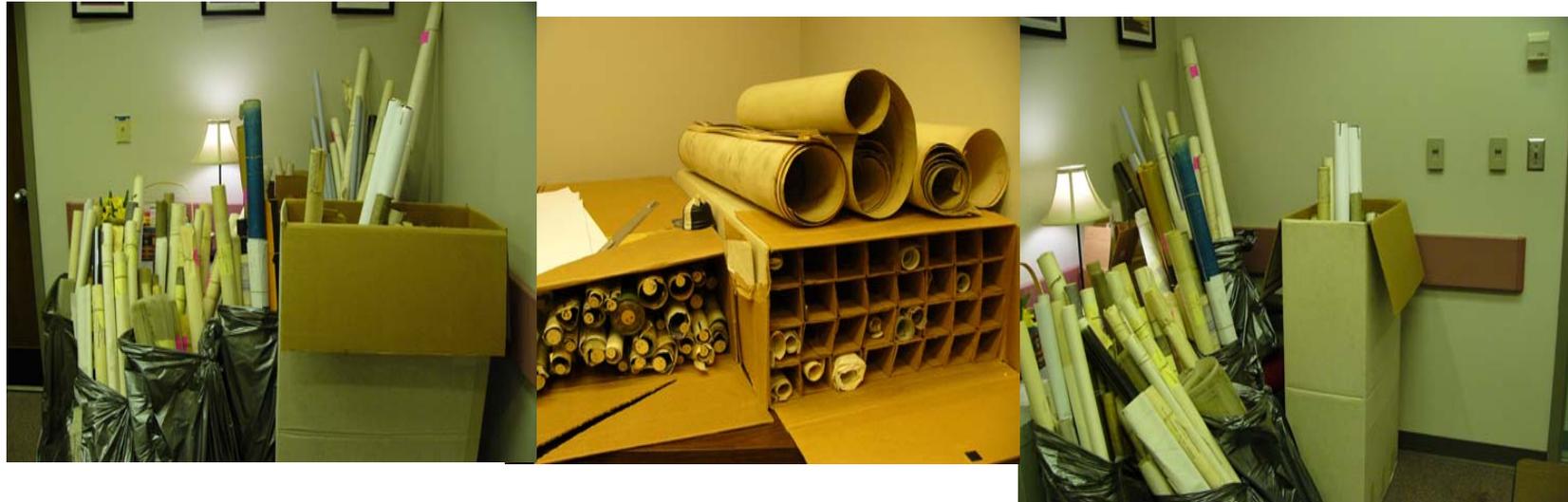
GIS and Web-Based Delivery



Collecting Maps

- DMME appealed to the mining industry and private individuals for contribution of mine maps
- Finding mine maps – physical location and ownership
- Hardcopy acquisition – off-site and on-site scanning
- The archive is comprised of mine maps from the mining industry, private collections, engineering firms, land offices, OSM mine map repository, along with existing DMME mine map collections





Hardcopy maps are in various conditions, sizes, scales, and media. Careful evaluation and precautions are taken to prevent damage to maps and scanners.



Scanning at DMME meets the recommended standards established by a National Map standards committee. Maps of all ages and conditions are scanned and digitally enhanced with the original design integrity uncompromised.

Image Detail

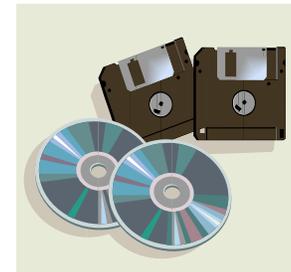


Maps are scanned with two large format 54 inch scanners



Map contributors have benefited by loaning DMME maps. Once the scanning and cataloging is complete, the maps are returned along with a digital archive, searchable spreadsheet, and map inventory of their collection. The digital archive is delivered on DVD, CD, or digital download.

1	A	B	C	D	E	F	G
MAP. NO	DMR NO	DM NO.	FEDERAL ID NO.	MAP DATE	COAL SEAM	COMPANY NAME	
2	RAP1000		XXXXX	XXXXX	7/1/1936		Rapoca Coal
3	RAP1001		XXXXX	XXXXX			Jewell & Vansant Coal Operations
4	RAP1002		XXXXX	XXXXX			Rapoca Coal Property Owners
5	RAP1003		XXXXX	XXXXX	9/30/1970	Pond Creek	Western Pocahontas
6	RAP1004		XXXXX	XXXXX			Rapoca
7	RAP1005		XXXXX	XXXXX			Rapoca
8	RAP1006		XXXXX	XXXXX			Rapoca
9	RAP1007		XXXXX	XXXXX			Rapoca
10	RAP1008		XXXXX	XXXXX			Rapoca
11	RAP1009		XXXXX	XXXXX			Rapoca
12	RAP1010		XXXXX	XXXXX	1/24/1981	Blair	Thompson Belcher
13	RAP1011		XXXXX	XXXXX	12/31/1976		United Coal
14	RAP1012		XXXXX	XXXXX			Bull Creek
15	RAP1013		XXXXX	XXXXX			
16	RAP1014		XXXXX	XXXXX	8/7/1972		James T. Justice Heirs
17	RAP1015		XXXXX	XXXXX			
18	RAP1016_1		XXXXX	XXXXX	10/1/1987	Hagy	Harman Mining
19	RAP1016_2		XXXXX	XXXXX	10/1/1987	Hagy	Harman Mining
20	RAP1017_1		XXXXX	XXXXX	10/1/1987	Eagle	Harman Mining
21	RAP1017_2		XXXXX	XXXXX	10/1/1987	Eagle	Harman Mining
22	RAP1018_1		XXXXX	XXXXX	10/1/1987	Blair	Harman Mining
23	RAP1018_2		XXXXX	XXXXX	10/1/1987	Blair	Harman Mining
24	RAP1019_1		XXXXX	XXXXX	10/1/1987	Glamorgan	Harman Mining
25	RAP1019_2		XXXXX	XXXXX	10/1/1987	Glamorgan	Harman Mining
26	RAP1020_1		XXXXX	XXXXX	2/1/1991		Pocahontas
27	RAP1020_2		XXXXX	XXXXX	2/1/1991		Pocahontas
28	RAP1020_3		XXXXX	XXXXX	2/1/1991		Pocahontas
29	RAP1021		XXXXX	XXXXX	4/4/2003		
30	RAP1022		XXXXX	XXXXX	12/31/1977		Island Creek Coal
31	RAP1023		05926	44-01520	9/30/1979	Pocahontas No 3	Island Creek Coal
32	RAP1024		XXXXX	XXXXX			
33	RAP1025		XXXXX	XXXXX	5/22/1980		
34	RAP1026		XXXXX	XXXXX			Elkhorn Coal
35	RAP1027		XXXXX	XXXXX	4/30/1970		National Shawmut Bank of Boston





With thousands of mine maps, a queriable database needed to be established.

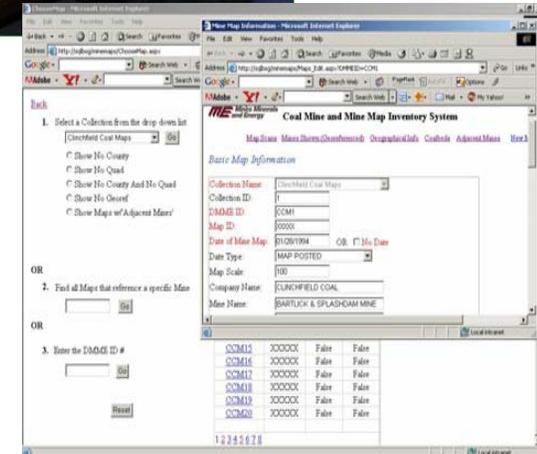


The Coal Mine and Mine Map Inventory System



Cataloging Maps

- Over 40 Unique Fields Collected
- Examples of key data collected:
 - License Numbers
 - Map Date
 - Company
 - Mine Hazards
 - Coalbed Name
 - Coordinate System



- *Coal Mine and Mine Map Inventory System* – a robust SQL database with a web form interface for data entry and retrieval
- Dual monitor workstations



Virginia's Coal Mine and Mine Map Inventory System



Coal Mine and Mine Map Inventory System

Map Processing

New Map Record

View/Edit Map Record(s)

Mine Processing

New Mine Record

View/Edit Mine Record

Miscellaneous

Edit Features/Location Table

Collections Maintenance

Adjacent Mines Entry

Verify Scanned Files

New!

Search!



Coal Mine and Mine Map Inventory System

[Back](#) [Map Scans](#) [Mines Shown \(Georeferenced\)](#) [Geographical Info](#) [Coalbeds](#) [Adjacent Mines](#) [New Map Entry](#) [Home](#)

Basic Map Information

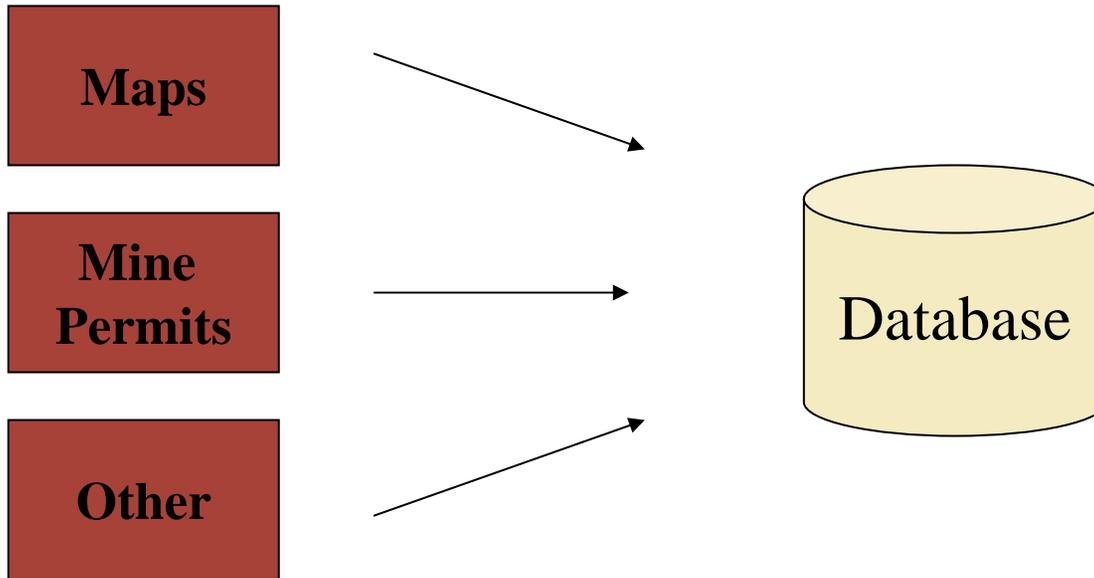
Collection Name:	<input type="text" value="DM Current"/>
Collection ID:	<input type="text" value="462"/>
DMME ID:	<input type="text" value="DMC462"/>
Map ID:	<input type="text" value="62914"/>
Date of Mine Map:	<input type="text" value="09/12/1976"/> OR <input type="checkbox"/> No Date
Date Type:	<input type="text" value="OTHER"/>
Map Scale:	<input type="text" value="100"/>
Company Name:	<input type="text" value="GRASSHOPPER ENTERPRISE"/>
Mine Name:	<input type="text" value="K 1 MINE"/>
Certified Engineer:	<input type="text"/>
Map Type:	<input type="text" value="HAND-DRAFTED"/>
Map Quality:	<input type="text" value="GOOD"/>
Vault Location:	<input type="text"/>
Entry Date:	<input type="text" value="10/18/2004"/>
Entry Initials:	<input type="text" value="RJK"/>

<input checked="" type="checkbox"/> Thickness Data	<input type="checkbox"/> Water
<input checked="" type="checkbox"/> Elevation Data	<input checked="" type="checkbox"/> Roof Falls
<input type="checkbox"/> Surface Mines	<input type="checkbox"/> Final Map
<input type="checkbox"/> Adjacent Mines	<input type="checkbox"/> Drains
<input type="checkbox"/> Auger Mines	<input checked="" type="checkbox"/> Crop Line
<input type="checkbox"/> Coreholes Present	<input type="checkbox"/> Other Portals
<input type="checkbox"/> Gas Wells Present	<input type="checkbox"/> VVHs

- Data Entry
- Extensive Search Capabilities
- Collection Maintenance
- Hyperlinks to Map Images



Define the Sources of Data



Collect and Distill these Data Elements



Basic Map Information

Basic Map Information

ANY ALSO BY THE LAWS OF THIS STATE, AND COVERS
THE PERIOD ENDING 8/27/97

Henry C. Murray P.E.
(EITHER CIVIL OR MINING ENGINEER OR LAND SURVEYOR)

SEAL

CLOSURE MAP
GARDNER, INC.

SEAM: RED ASH MINE NO.: 1

LOCATION: 3 MILES EAST ON ROUTE 638
FROM INTERSECTION OF ROUTES 638 AND
& 641 AT PATTERSON, BUCHANAN CO. VA.

M.S.H.A ID NO.: 44-06850

VA MINE INDEX NO.: 14429 AA

SCALE: 1" = 200' DATE: 8/27/97

COMMONWEALTH OF VIRGINIA
HENRY C. MURRAY
No. 11259
PROFESSIONAL ENGINEER

APPROVED
FILE COPY
- 5 1997
DIVISION OF MINES

Collection Name:	DM Current
Collection ID:	99
DMME ID:	DMC99
Map ID:	14429
Date of Mine Map:	08/27/1997 OR <input type="checkbox"/> No Date
Date Type:	MAP POSTED
Map Scale:	200
Company Name:	GARDNER INC
Mine Name:	# 1
Certified Engineer:	HENRY C. MURRAY
Map Type:	COMPUTER-DRAFTED
Map Quality:	GOOD
Vault Location:	
Entry Date:	07/16/2004
Entry Initials:	EXQ



- Thickness Data
- Elevation Data
- Surface Mines
- Adjacent Mines
- Auger Mines
- Coreholes Present
- Gas Wells Present
- Water
- Roof Falls
- Final Map
- Drains
- Crop Line
- Other Portals
- VVHs

Comments:

Empty text box for comments.

Company Coalbed(s)

<input checked="" type="checkbox"/> Scanned	<input type="checkbox"/> Vectorized
<input type="checkbox"/> Georeferenced	Map Status: <input type="text" value=""/>
<input type="checkbox"/> Unsuccessful GeoRef Attempt	<input type="text" value=""/>

Georeferencing Method

State Plane <input type="checkbox"/>	Northing <input type="text" value=""/>	Easting <input type="text" value=""/>
Lat/Long Point <input type="checkbox"/>	Latitude Deg <input type="text" value=""/> Min <input type="text" value=""/> Sec <input type="text" value=""/>	
	Longitude Deg <input type="text" value=""/> Min <input type="text" value=""/> Sec <input type="text" value=""/>	
Company Coordinates <input checked="" type="checkbox"/>		



Quality Control

- Data Entry Constraints
 - Drop-down lists
 - Required fields
- Standardized Stratigraphy
- Periodic Data Integrity Checks



Search Capabilities

- **Ability to do text searches**
- **Ability to do spatial searches**
- **Search tool accessible to all users**



Multiple Search Field and Conditions



Coal Mine and Mine Map Inventory System

[Home](#)

Search Field	Search Condition	Search Value	And/Or	Search Value	And/Or
County	=	BUCHANAN	And		
Coal Bed - Standard	=	HAGY	And		
Map Scale	=	400			

Rows shown per page

165 records

1 [2](#) [3](#) [4](#) [5](#) [6](#) [7](#) [8](#) [9](#) [10](#) ...

Map #	Adjacent Mines, etc.	Map Date	Mine #	Mine Name	Company	Final Map?	Georef?	Adjacent Mines?	Latitude	Longitude	Co. Coalbed
CBM1060	<input type="button" value="View"/>	8/1/1981	12419		PAGE FORK COAL	False	True	False			SPLASHDAM
CBM120	<input type="button" value="View"/>	4/7/1988	09279		HARMAN MINING	True	True	True			HAGY
CBM1262	<input type="button" value="View"/>	12/26/1995	11703		DOMINION COAL	False	True	True			HAGY
CBM1356	<input type="button" value="View"/>	6/21/1991	11371		DOMINION COAL	False	True	True			HAGY
CBM1402	<input type="button" value="View"/>	7/1/1995	12831		KEY WEST MINING	False	True	False			HAGY



Types of Analysis

- ✚ Direct map feature comparison
- ✚ Potential for imagery verification
- ✚ Acreage calculations
- ✚ Potential for more complex analysis (CHIA's & TMDL)
- ✚ Identify potential conflicts with other permits and past mining activities
- ✚ Easy query and navigation capabilities
- ✚ Discipline specific analysis, i.e. geology, water monitoring, engineering etc.



Achievements and Recognition

- ✦ Integrated systems linked together
 - Field Staff Mapping Applications
 - EP Mapping Application
 - Intranet Mapping applications
 - Underground Mine Mapping Applications

These efforts have resulted in DMME being awarded the Commonwealth of Virginia's Innovative Technology Symposium's (COVITS) Governor's Technology Award and the Southwest Virginia's Technology Council's High Tech in Government Award



So Why Use Geospatial datasets?

- ✦ Mining information *is* location-based
- ✦ Predictive, preventive, and informative analysis
- ✦ Trends in mining activity
- ✦ Historic tracking and record keeping of geographic information
- ✦ Easily retrieve information for decision-making



Geospatial Dataset Sharing - Where to Start?

- ✦ SMCRA requirements are the “common” bond
- ✦ Geospatial datasets that impact the national coal mining geospatial infrastructure
- ✦ Enable the broad understanding of coal mining activities on a national scale
- ✦ Under the guidelines established by the SMCRA – permit boundary geo-datasets are the most likely place to start



National Significance of Sharing Coal Mining Geospatial Datasets with NCMGC

- ✦ National energy strategies and coal in energy policies
- ✦ Expertise and information sharing among common interest groups
- ✦ Potential shared cost benefits
- ✦ The advantage of TIPS software, hardware, and training opportunities for the benefit of the coal mining geospatial community (technology sharing)



“It’s a Marathon... Not a Sprint”

- 🐛 Establish metrics and standard methodologies
- 🐛 Build upon IT infrastructure – merging of traditional IT and geospatial technologies
- 🐛 Pursue new technologies as they develop
- 🐛 Fund the effort at all levels
- 🐛 Customer service! Understand the customer dynamics. Remember the citizens, industry, shareholders and stakeholders that are being served
- 🐛 Stay the course... when it leads in the right direction





**THANK
YOU**