# CAD Standards

***Virginia Division of Mined Land Reclamation***

***Electronic Permitting***

NAAMLP

2008 GEOSPATIAL CONFERENCE
& 2nd National Meeting of SMCRA Geospatial Data Stewards

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Virginia Department of Mines Minerals and Energy

# Why CAD Standards and Why now?

*"the wonderful thing about standards is that there are so many from which to choose"*

# Why CAD Standards and Why now?

The increasing frequency of electronic drawing exchange, especially in the Coal industry, is driving regulatory agencies to pay more attention to CAD standards.

# Why CAD Standards and Why now?

CAD sophistication has increased in the Coal industry and the regulatory agencies need to adapt to this trend.

# Why CAD Standards and Why now?

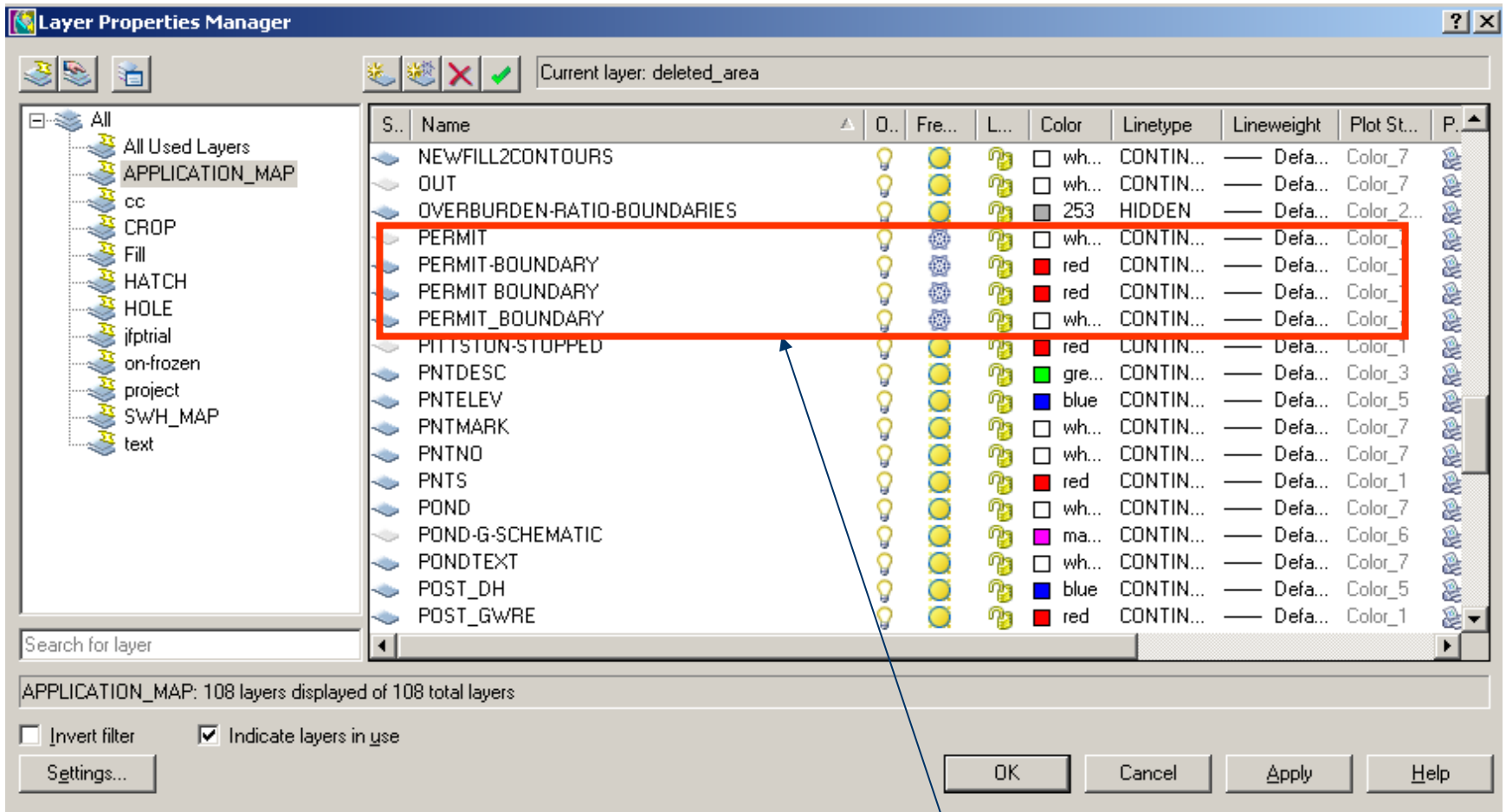
Coal & Consulting Companies Perspective

- Drawing Standards
- Quality Standards
- CAD Standards

# Why CAD Standards and Why now?

For VA DMME, the motivating factor was Electronic Permitting (EP)!!

# Why CAD Standards and Why now?




**Take note of the 4 layers identifying a Permit boundary**

# Standards – a smooth transition is important

## CAD Layer Guidelines for EP section 21.5 GIS Map

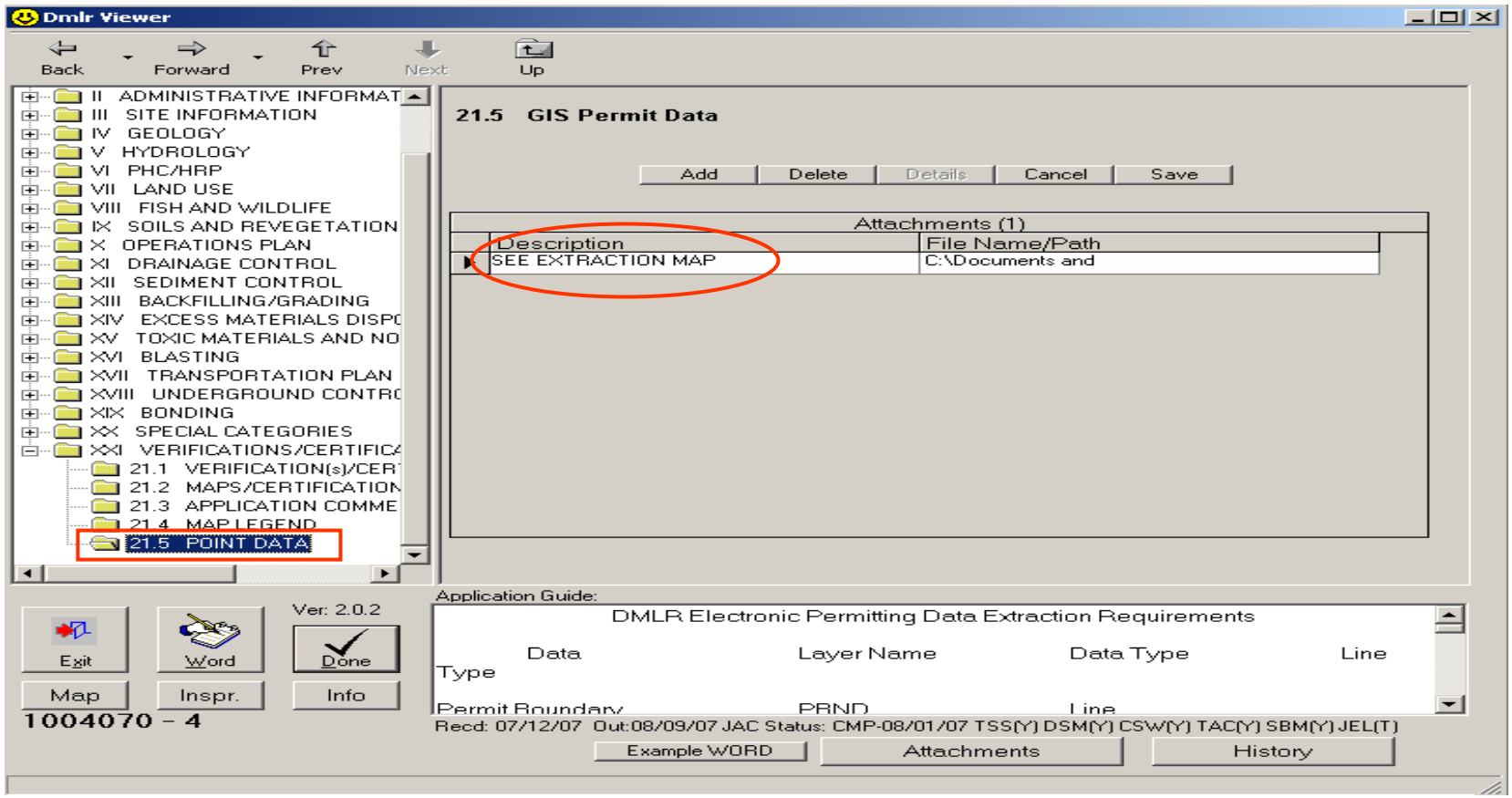
### DMLR Electronic Permitting Data Extraction Requirements

**The information required by DMLR shall be in the form of an AutoCad DWG file. The file name shall be Application Number_DMLR.dwg Example Name: 100XXXX_DMLR.dwg**

**Please submit in NAD 27 Virginia South State Plane Coordinates**

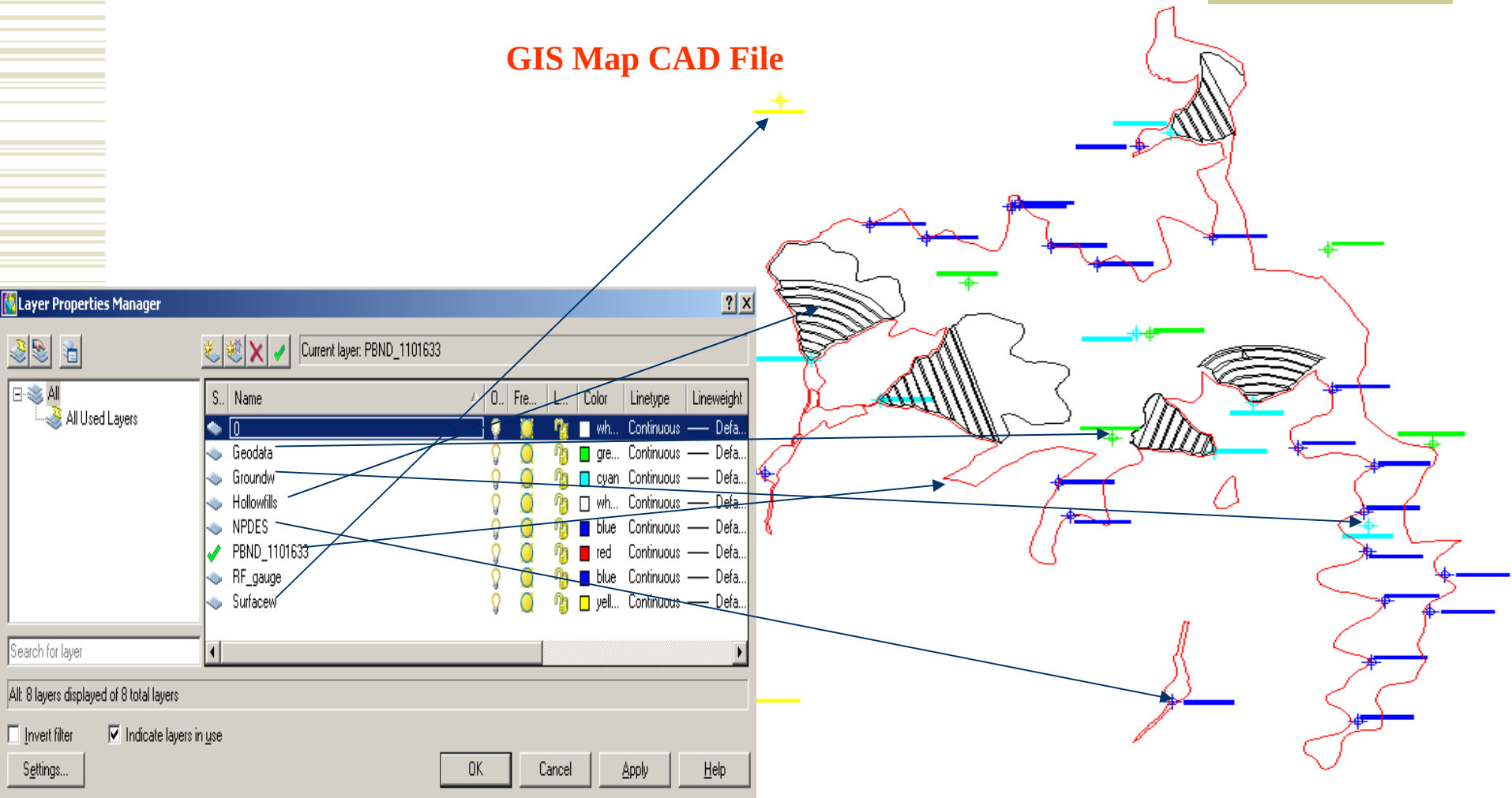
| Data | Layer Name | Data Type | Line Type |
|---|---|---|---|
| Permit Boundary | PBND | Line | Polyline |
| Relinquishment | Permit#_relinq | Line | Polyline |
| NPDES Monitoring Point | NPDES | Point | N/A |
| Surface water (In-Stream) Monitoring Point | Surfacew | Point | N/A |
| Groundwater Monitoring Point | Groundw | Point | N/A |
| Rainfall Gauge | RF | Point | N/A |
| PMU | PMU_(SeamName) | Line | Polyline |
| Geologic Sampling Points | Geodata | Point | N/A |
| Hollowfill | Hollowfill | Line | Polyline |

# Standards – a smooth transition is important



# Standards – a smooth transition is important

**GIS Map CAD File**



# How to develop a CAD Standard

- **Implementing a standard has its difficulties**
- **Obtain implementation support from upper management**
- **Identify personnel to lead the effort**
- **Develop step by step process—do the easy stuff first**
- **Make sure that industry and their consultants are fully onboard and are part of the process**
- **Or you could just let some other state program do most of the work for you and then steal their ideas**

# CAD Standards Workgroup

- VA DMLR Technical Reviewer's (by discipline)
  - A. Engineering
  - B. Hydrology
  - C. Geology
  - D. Soils
  - E. Mapping
- Coal Industry Representatives
  - A. Coal Company's
  - B. Consultant's

# Coal Industry and CAD Standards

**Most companies and their consultants already have in-house established CAD Standards**

**In Virginia, coal companies and their consultants are positive about establishing CAD Standards in regards to Electronic Permitting submittals**

**In fact, VA DMLR has adopted many of the standards being used by the coal companies and their consultants**

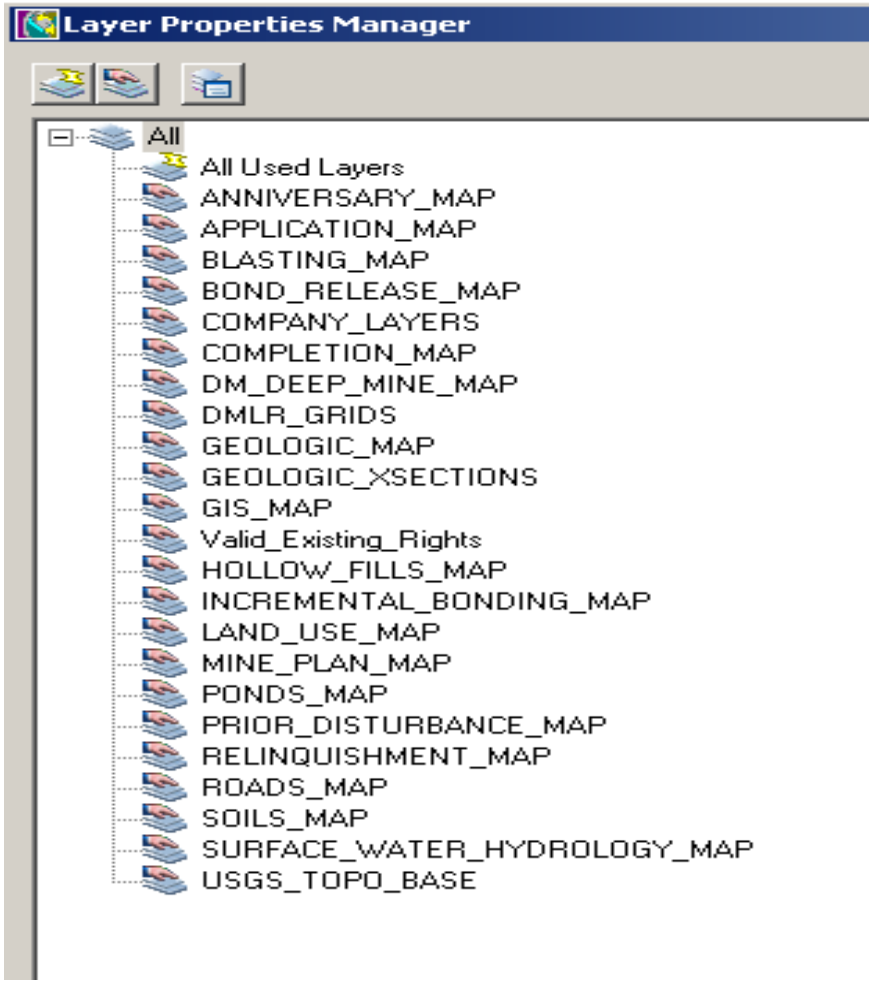
# CAD Standards Workgroup

## Mapping Protocols

- Map Types
- File Naming Conventions
- Layer Naming Guidelines
- Layer Property Guidelines
- Standard Templates

# CAD Standards Workgroup

## Map Types



# CAD Standards Workgroup

## File Names

New Permit: *Application#*_applicmap.dwg / 1004648_applicmap.dwg

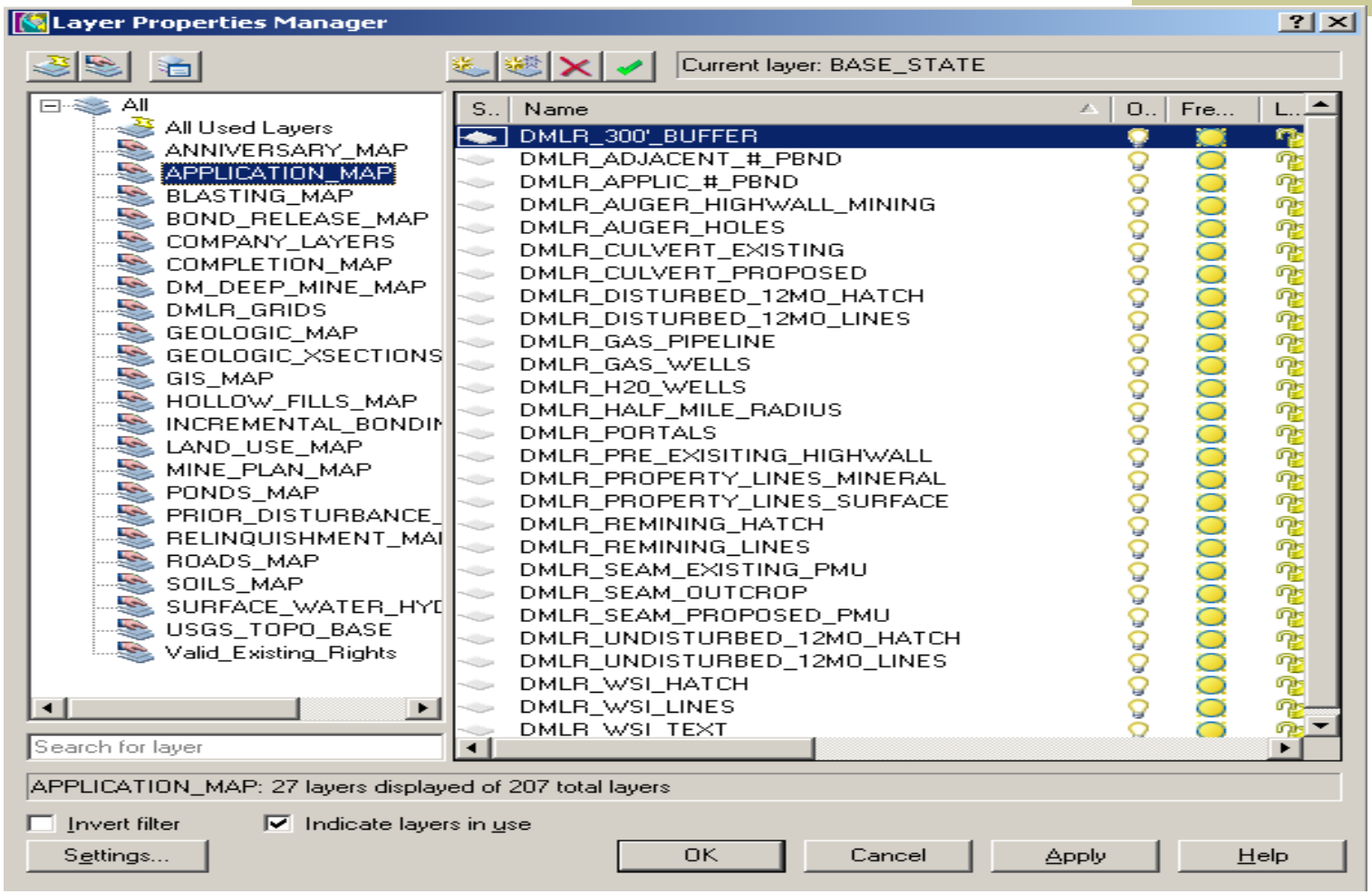
*Application#*_swhmap.dwg / 1004648_swhmap.dwg

Existing Permit: *Revision#*_revmap.dwg / 1007825_revmap.dwg

*Revision#*_geomap.dwg / 1007825_geomap.dwg

# CAD Standards Workgroup

## Layer Naming Guidelines



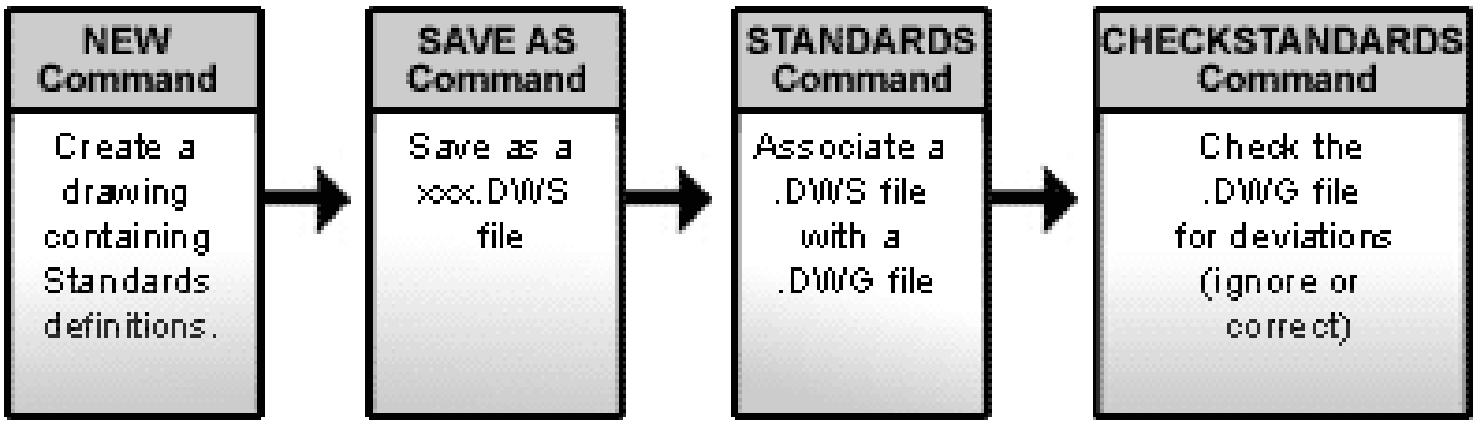
# CAD Standards Workgroup

## Layer Property Guidelines

- Dimension Styles
- Text Styles
- Hatch Styles
- Line Color
- Line Type
- Line Width

# CAD Standards Workgroup

## Standard Templates



United States

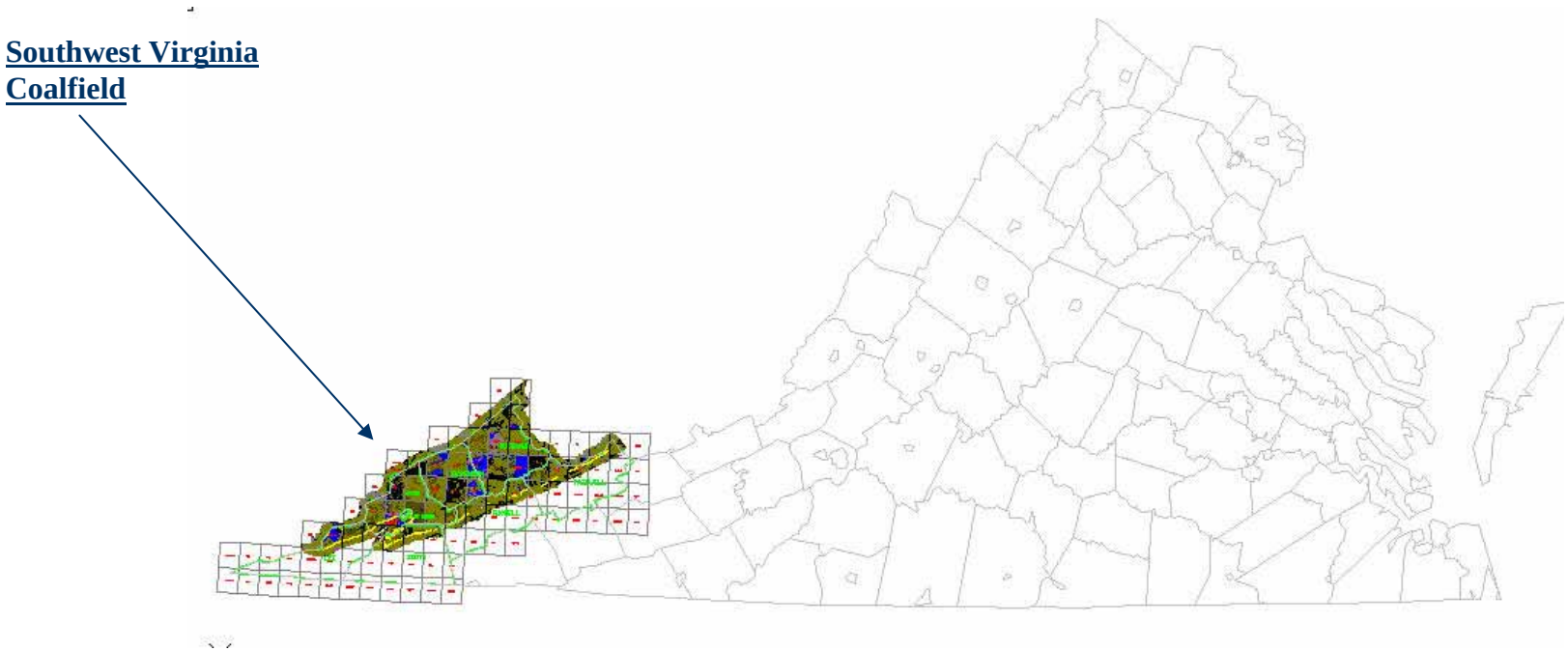
# National CAD Standard®

A Consensus Standard Incorporating Industry Publications

The U.S National CAD Standard (NCS) is the only comprehensive U.S. CAD Standard for the design, construction and facility management industries. The program's goal is broad voluntary adoption of the CAD Standard by the building design, construction and operation sectors, thereby establishing a common language for the building design and documentation process.

**Waste of time for developing standards related to Coal Mining Permits**

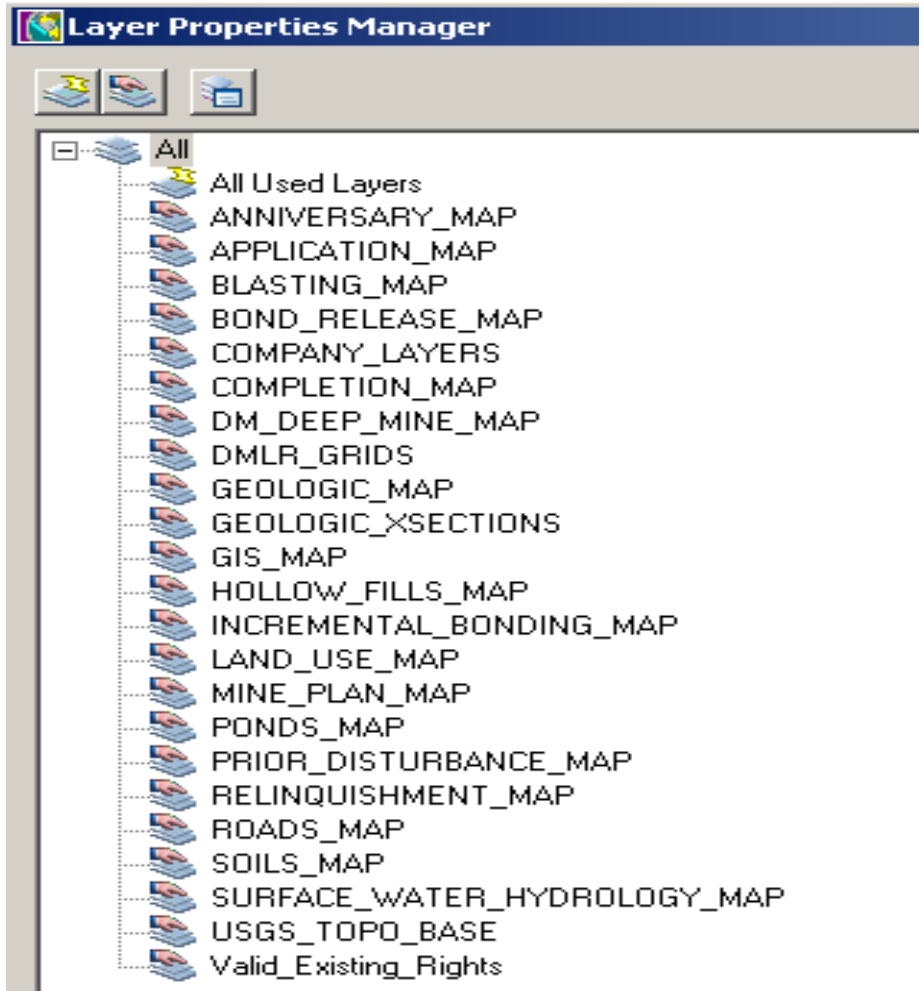
# Virginia Standards and where they apply



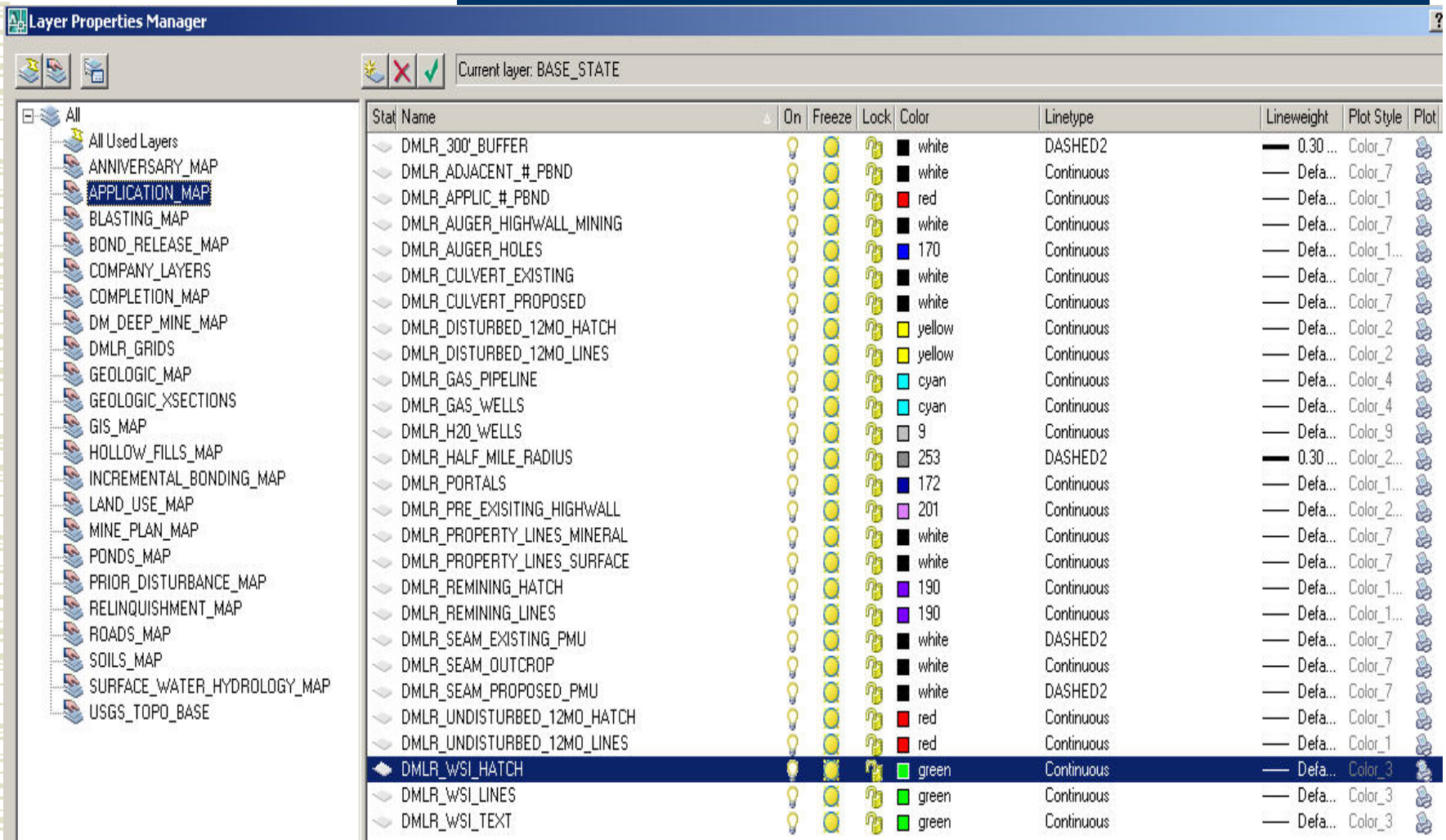
# CAD Standard (files)

| Name | Size | Type |
|---|---|---|
| DMLR_EP_STANDARDS.dwg | 175,362 KB | AutoCAD Drawing |
| DMLR_EP_STANDARDS.dws | 177,378 KB | AutoCAD Drawing Standards File |
| DMLR_EP_STANDARDS.dwt | 177,035 KB | AutoCAD Template |
| DMLR_CAD_Standard.xls | 510 KB | Microsoft Excel Worksheet |

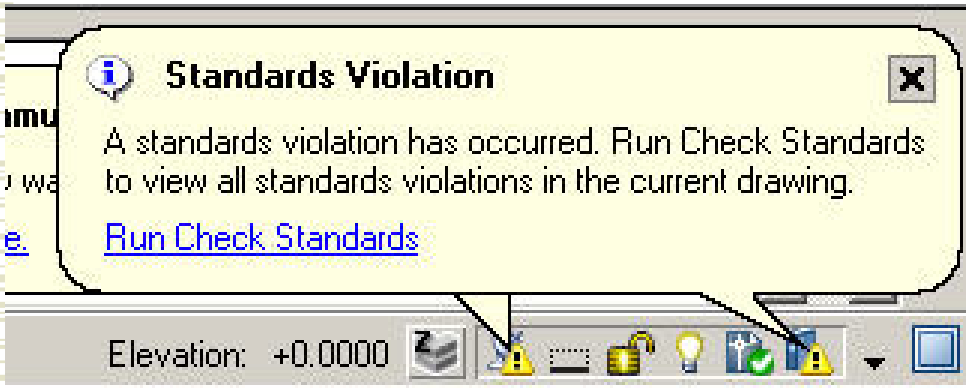
# Identify what Permit Maps require standards

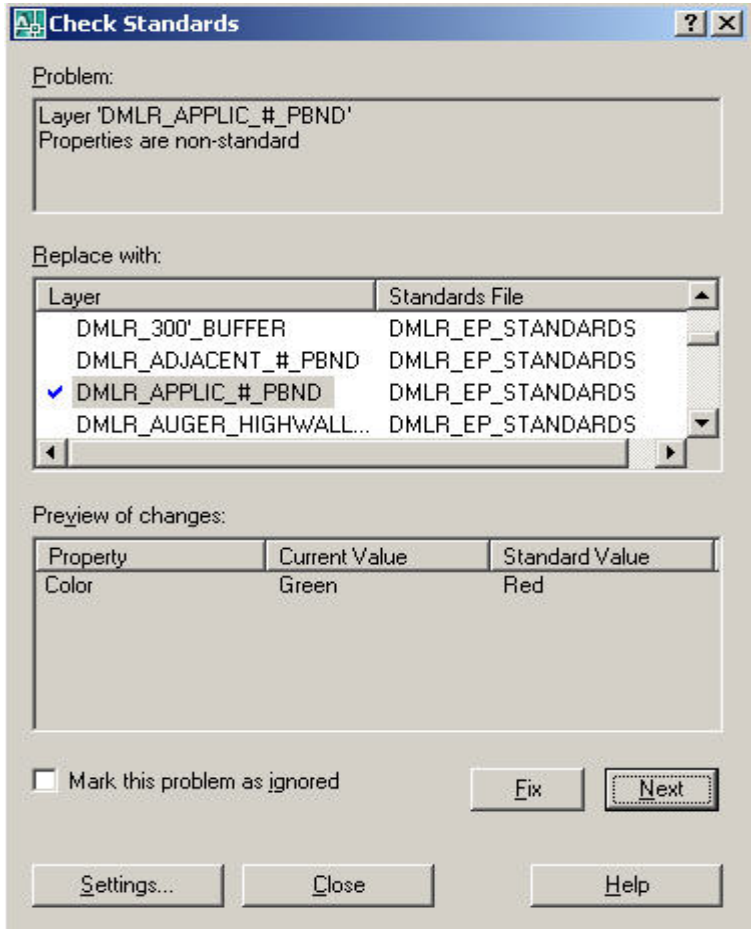


# Establish one drawing template for each permit map that requires a Standard



# Check Drawings for Standard Violations



# One last thought….

***You cannot make a vulgar offensive cad conduct himself as a gentlemen.***

***-A.K.H. Boyd, Lessons of Middle Age, 1868.***