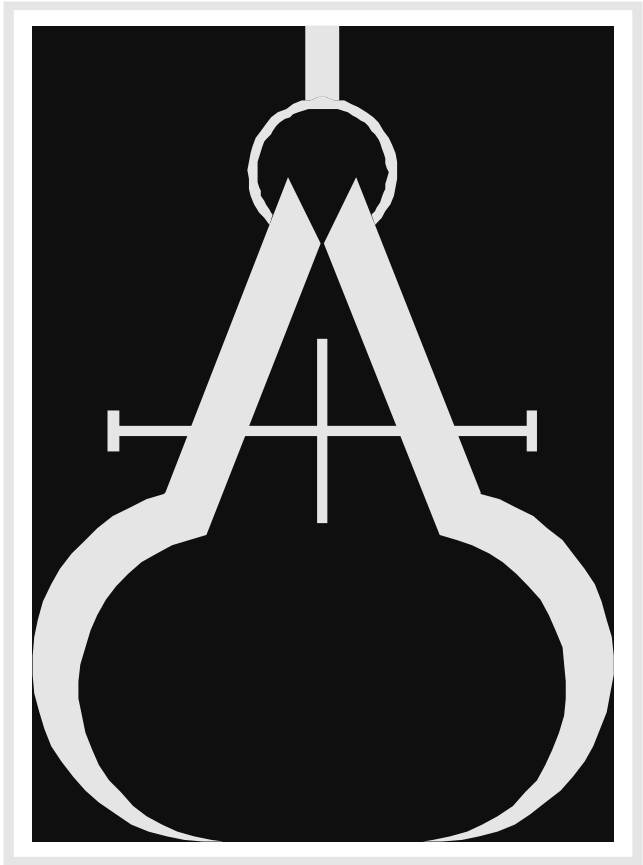
Module 4

- Dust Measurements
- Opacity Pictures
- Plans

How Do You Measure Dust?



Dust Is Measured Through...

- Visible Emissions Readings that Measure Opacity
  - Opacity is a measure (quantitative assessment) of the dust emitted into the air

How Do You Measure Opacity?

- USEPA Method 9

- If you see dust you can assume the visible emissions are above 10% opacity

Method 9 Requirements

- Sun at your back
- Wind perpendicular to line of sight
- Contrasting background
- No co-mingling of plumes
- Six minute averages

Opacity Pictures

PLEASE NOTE

- The following pictures are for discussion purposes only.
- Do not use these pictures to make opacity measurements
- Viewing of these pictures does not meet the requirements for passing visible emissions certification

Picture 1-Visible Emissions 0%

- Primary Crusher: Impactor
- Method 9 Wet (spray bar on crushing spread)
- Overall shot
- Haze in sky due to cumulus clouds

Picture 2-10% Visible Emissions

- Primary crusher
- Method 9 Wet
- Look for
  - **10% Visible Emissions obscuring grizzly at left**

Picture 3-20% Visible Emissions

- Primary with grizzly
- Method 9 Wet
- Loading Grizzly
  - **20% visible emissions just above hopper lid**
  - **Cumulus clouds to right**

Picture 4-Visible Emissions 30%

- Primary with grizzly
- Backlit, wet
- Mixture of grizzly loading dust, primary dust, and haul road dust

Picture 5-Visible Emissions 40%

- Primary
- Backlit, wet
- Backlit dust from primary

Picture 6-Visible Emissions 0%

- Screen
- Method 9, wet
- Conveyor transfer points shrouded

Picture 7-Visible Emissions 0%

- Screen
- Method 9, wet
- Detail of screen shows no Visible Emissions

Picture 8-Visible Emissions 0%

- Conveyor
- Method 9, wet
- Shrouding

Picture 9-Visible Emissions 40%

- Conveyor
- Method 9, wet
- Instantaneous

Picture 10-Visible Emissions 0%

- Tertiary Crusher
- Method 9, wet
- Haze in sky

Picture 11-Visible Emissions 5%

- Conveyor
- Method 9, wet

Picture 12-Visible Emissions 5%

- Tertiary Crusher
- Method 9, wet
- Visible emissions can be noticed against sky

Picture 13-Visible Emissions 40%

- Conveyor
- Backlit, wet
- Visible emissions obscure trees

Picture 14-Visible Emissions 20%

- Tertiary Crusher
- Backlit,wet
- Apparent 20% Opacity obscuring trees

Picture 15-Visible Emissions 30%

- Primary
- Backlit, wet

Picture 21-Visible Emissions 15%

- Conveyor
- Method 9, dry
- 15% Opacity at shaded area in lower right center of photograph

Picture 22-Visible Emissions 15%

- Tertiary Crusher
- Method 9, dry
- 15% Opacity at shaded area at bottom center of photograph

Picture 23-Visible Emissions 15%

- Screen
- Method 9, dry
- 15% Opacity at transfer point to screen at top of photograph

Picture 24-Visible Emissions 10%

- Screen
- Method 9, dry
- 10% Opacity at transfer point to screen at top of photograph