

Summer 2024

# MSHA: SILICA FINAL RULE



## 30 CFR PART 60 RESPIRABLE CRYSTALLINE SILICA

- Establishes a uniform permissible exposure limit (PEL) and action level (AL) for all mines.
- Specifies methods of controlling respirable crystalline silica.
- Requires exposure monitoring for respirable crystalline silica.
  - Requires sampling and periodic evaluations.
  - Requires immediate reporting and corrective actions in the case of overexposure results.
- Updates the respiratory protection standards by incorporating by reference ASTM F3387-19 *Standard Practice for Respiratory Protection*.
- Requires medical surveillance at MNM mines.

## BACKGROUND - STATUTORY AUTHORITY

- Federal Mine Safety and Health Act of 1977 (as amended)
  - Sec. 101(a)(6)(A): “The Secretary [of Labor]...shall set standards which most adequately assure...that no miner will suffer material impairment of health or functional capacity...for the period of his working life.”
  - Sec. 101(a)(7): “...[the] mandatory standard shall also prescribe suitable protective equipment and control...and shall provide for monitoring or measuring miner exposure...to assure the maximum protection of miners. In addition...any such mandatory standard shall prescribe...medical examinations or other tests which shall be made available, by the operator at his cost, to miners...to most effectively determine whether the health of such miners is adversely affected by such exposure. ... [the] mandatory standard shall provide that where a determination is made that a miner may suffer material impairment of health or functional capacity by reason of exposure...that miner shall be removed from such exposure and reassigned.”

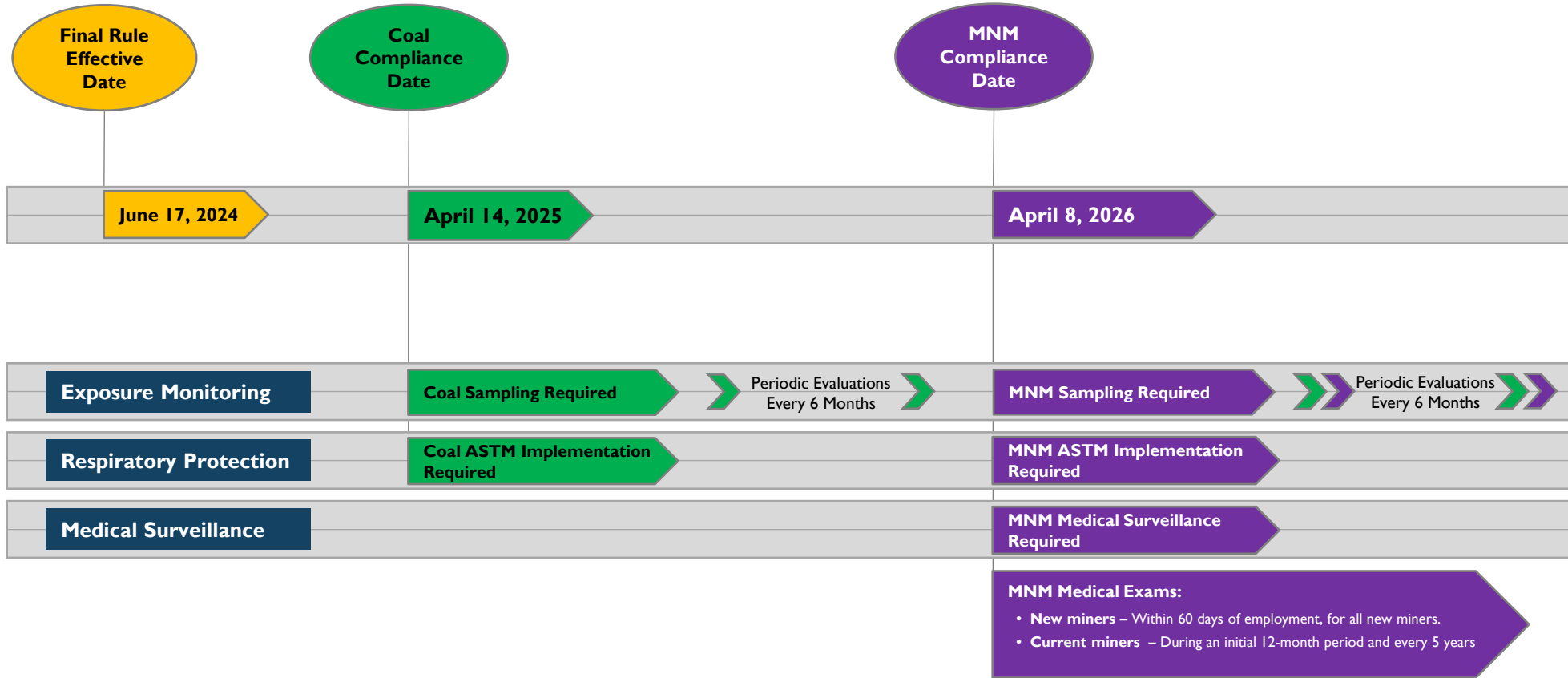
## IMPORTANT DATES

- Effective date: June 17, 2024
- Compliance date for coal mine operators: April 14, 2025
- Compliance date for MNM mine operators: April 8, 2026

## PART 60 RESPIRABLE CRYSTALLINE SILICA

- Section 60.1 – Scope; Compliance Dates
- Section 60.2 – Definitions
- Section 60.10 – Permissible Exposure Limit
- Section 60.11 – Methods of Compliance
- Section 60.12 – Exposure Monitoring
- Section 60.13 – Corrective Actions
- Section 60.14 – Respiratory Protection
- Section 60.15 – Medical Surveillance
- Section 60.16 - Recordkeeping

# SECTION 60.1- SCOPE; COMPLIANCE DATES



## SECTION 60.2 – DEFINITIONS

- *Action level* means an airborne concentration of respirable crystalline silica of 25 micrograms per cubic meter of air ( $\mu\text{g}/\text{m}^3$ ) for a full-shift exposure, calculated as an 8-hour time-weighted average (TWA).
  - *According to NIOSH research, wherever exposure measurements are above one-half the PEL, the employer cannot be reasonably confident that the employee is not exposed to levels above the PEL on days when no measurements are taken.*
  - *Further sampling is required when a sampling result is at or above the Action Level.*
  - *Sampling can be discontinued when two consecutive sampling results show miners' exposures below the Action Level.*
- *Respirable crystalline silica* means quartz, cristobalite, and/or tridymite contained in airborne particles that are determined to be respirable by a sampling device designed to meet the characteristics for respirable-particle-size-selective samplers that conform to the International Organization for Standardization (ISO) 7708:1995:Air Quality—Particle Size Fraction Definitions for Health-Related Sampling.
  - *This definition represents an international consensus, harmonizes with the standards used by the American Conference of Governmental Industrial Hygienists (ACGIH), the Occupational Safety and Health Administration (OSHA), the National Institute for Occupational Safety and Health (NIOSH) and the European Committee for Standardization (CEN), and eliminates inconsistencies in the former standards for MNM and coal mines.*

## SECTION 60.10 – PERMISSIBLE EXPOSURE LIMIT (PEL)

- Mine operators must ensure that no miner is exposed to a respirable crystalline silica concentration in excess of 50 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) of air for a full-shift exposure, calculated as an 8-hour TWA.
  - *Same as the previous calculation of silica concentration at MNM mines.*
  - *Uses a full-shift exposure (including extended shifts), calculated as an 8-hr TWA.*
  - *Starting from the coal compliance date, the reduced standard for respirable dust when quartz is present will no longer be applied at coal mines. (Conforming amendments to parts 70, 71, and 90.)*



## SECTION 60.11 – METHODS OF COMPLIANCE

Methods that operators can use to achieve compliance with the PEL:

- Mine operators are required to install, use, and maintain feasible engineering controls, supplemented by administrative controls when necessary.
  - *Engineering controls, as the primary means of control*
    - *Examples: ventilation systems, dust suppression devices, enclosed cabs or control booths with filtered breathing air, and changes in materials handling or equipment used*
    - *Administrative controls, as a supplement*
      - *Examples: housekeeping procedures; walking around the outside of a dusty process area rather than walking through it; cleaning of spills; and measures to prevent or minimize contamination of clothing to help decrease miners' exposure to respirable crystalline silica*
- Rotation of miners is prohibited as an acceptable administrative control for respirable crystalline silica, a carcinogen.

## SECTION 60.12 – EXPOSURE MONITORING

Two ways to monitor miners' exposures to respirable crystalline silica:

(A) Sampling airborne dust and (B) Periodic Evaluations of the mining environment

### A. Sampling

1. Requirements
2. Type/Sequence

### B. Evaluations

1. Evaluating what, how, and when
2. What to do after an evaluation

## SECTION 60.12 – EXPOSURE MONITORING (CONT'D)

### A.1 Sampling Requirements

- Personal breathing-zone air samples for MNM operations and occupational environmental samples in accordance with 70.201, 71.201, and 90.201, for coal operations.
- For the duration of a miner's regular full shift and during typical mining activities, including shaft and slope sinking, construction, and removal of overburden.
- May sample a representative fraction of miners (at least two miners) when several or more miners perform the same tasks on the same shift and in the same work area; must select the miners who are expected to have the highest exposure to respirable crystalline silica.

## SECTION 60.12 – EXPOSURE MONITORING (CONT'D)

### A.1 Sampling requirements (cont'd)

- Use respirable-particle-size selective samplers that conform to ISO 7708:1995(E).
  - *A number of models available in the market for purchase or for rental*
  - *Industrial hygienists, Safety professionals*
- Have the samples analyzed by a laboratory that: (1) is ISO-accredited by an (ISO-compliant) accreditation body and (2) analyzes the samples using one of the analytical methods specified by MSHA, NIOSH, or OSHA.
  - *30 commercial labs in the US as of fall 2023*
- Make a record of: the sampling date, occupations sampled, and the concentrations of respirable crystalline silica and respirable dust.
- Post the record and the lab report on the mine bulletin board and share them electronically, if applicable, for 31 days upon receipt.

## SECTION 60.12 – EXPOSURE MONITORING (CONT'D)

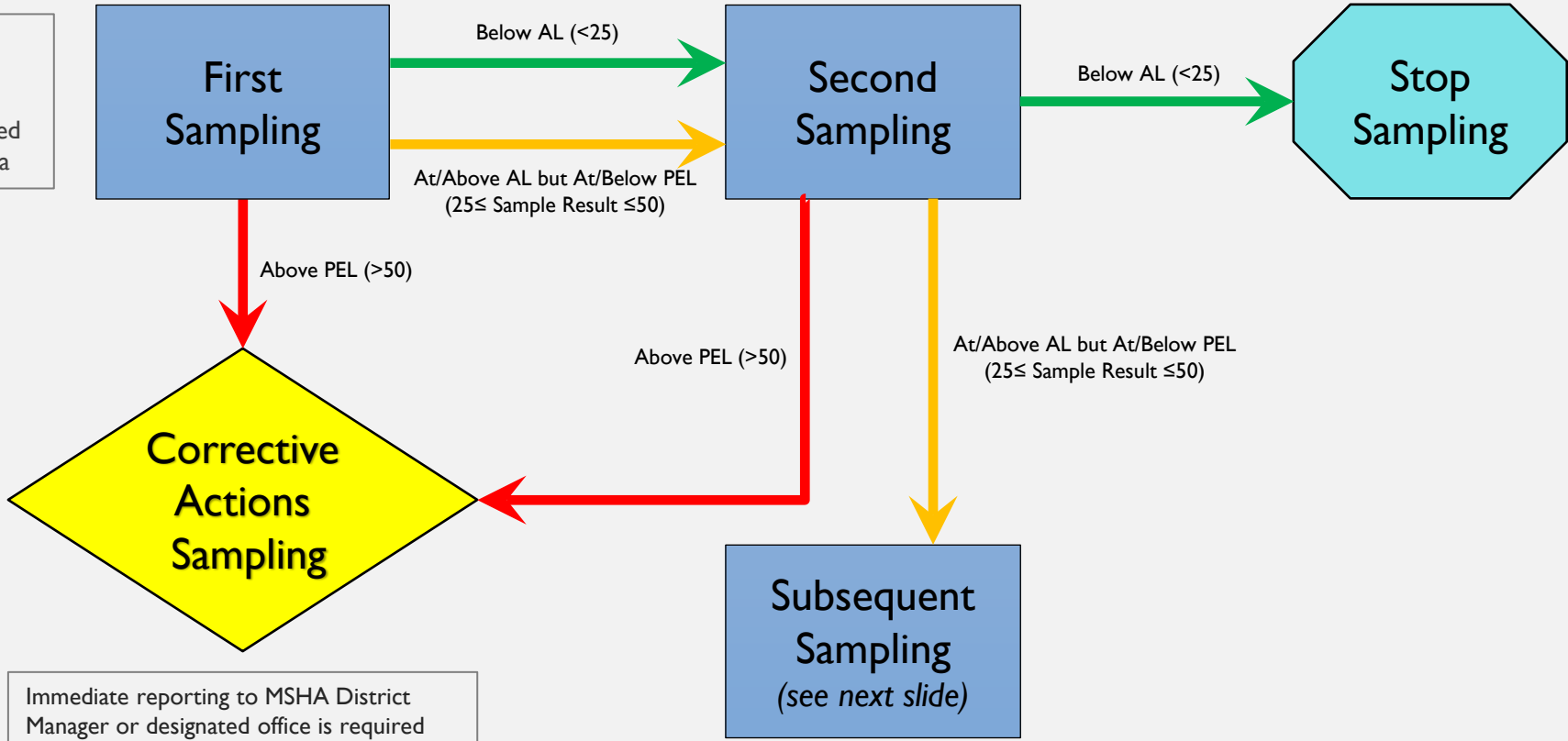
### A.2 Sampling Type/Sequence

- Initial samplings (first sampling and second sampling):
  - For any miner who is exposed or may reasonably be expected to be exposed to silica.
  
- Subsequent samplings are required when:
  - Sampling result is at or above the AL but at or below the PEL. ( $25 \leq$  miner's exposure  $\leq 50$ )
  
- Sampling can be stopped when:
  - Two consecutive samplings indicate that miner exposures are below the AL.
  - (The second of these samplings must be taken after the operator receives the results of the prior sampling but no sooner than 7 days after the prior sampling was conducted.)
  
- Corrective actions sampling is required when:
  - Sampling result is above the PEL. (More corrective actions on later slides)

# EXPOSURE MONITORING: INITIAL SAMPLINGS

**For Initial Samplings:**

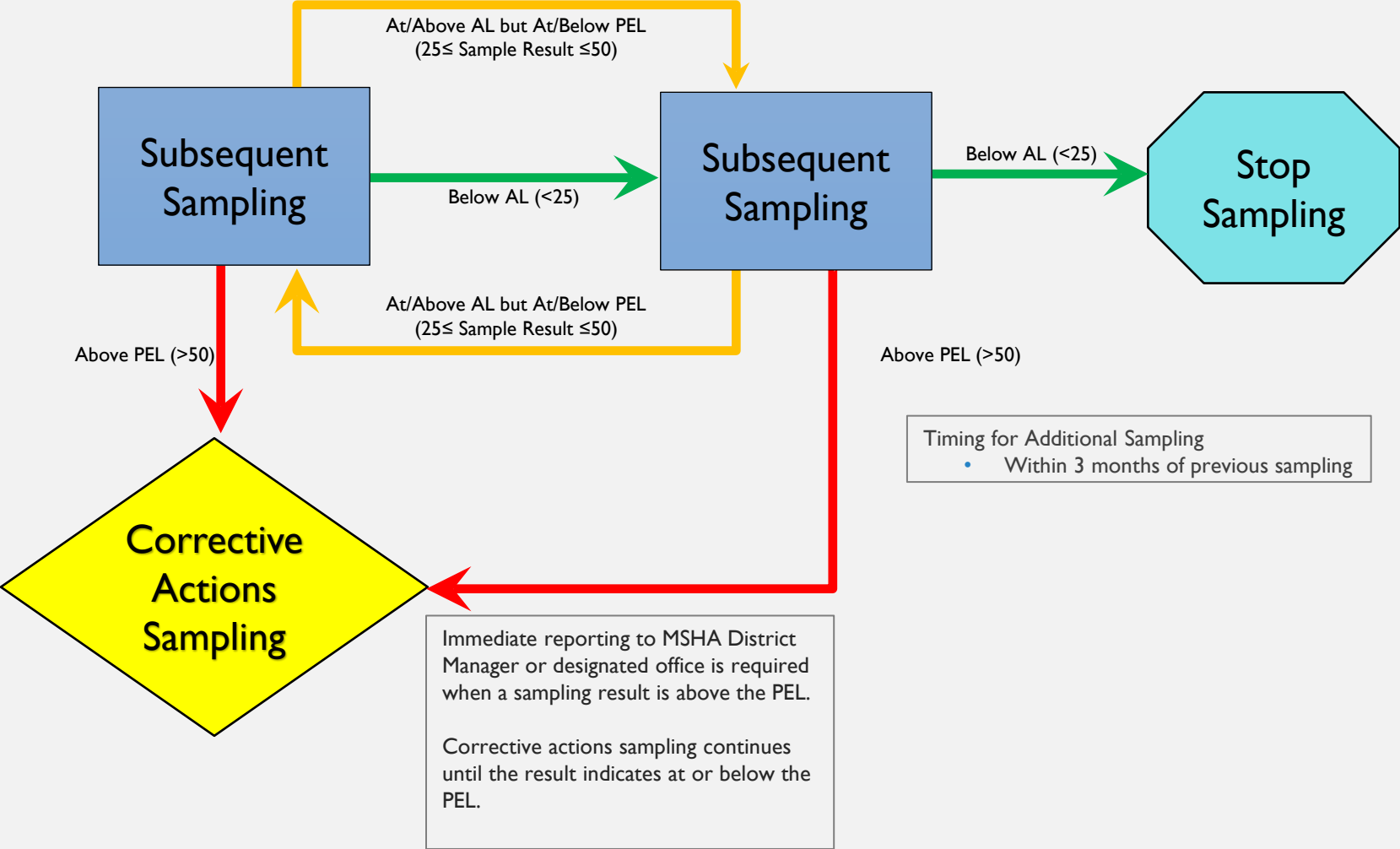
- Any miner who is exposed or may reasonably be expected to be exposed to silica



Immediate reporting to MSHA District Manager or designated office is required when a sampling result is above the PEL.

Corrective actions sampling continues until the result indicates at or below the PEL.

# EXPOSURE MONITORING: SUBSEQUENT SAMPLINGS



## SECTION 60.12 – EXPOSURE MONITORING (CONT'D)

### B. Periodic Evaluations

- Evaluate a change in production, processes, installation or maintenance of engineering controls, installation or maintenance of equipment, administrative controls, or geological conditions and determine whether the change may reasonably be expected to result in new or increased exposure to respirable crystalline silica.
- Conduct sampling if the change may result in miners being exposed at or above the AL.
  - *Post-evaluation sampling must be conducted when the operator determines based on an evaluation that the change may reasonably be expected to result in new or increased exposure so that miners may be exposed at or above the AL.*
- Make a record of the evaluation -- evaluated change, the impact on respirable crystalline silica exposure, and the date of the evaluation.
- Post the record on the mine bulletin board, and if applicable, by electronic means, for the next 31 days.
- At least every 6 months or whenever there is a change in production, processes, etc.



## SECTION 60.13 – CORRECTIVE ACTIONS

- When miners' exposures are above the PEL, mine operators must:
  - Make NIOSH-approved respirators available to affected miners before the start of the next work shift;
  - Ensure that affected miners wear respirators properly for the full shift or during the period of overexposure until miner exposures are at or below the PEL;
  - Immediately take corrective actions to lower the concentration of respirable crystalline silica to at or below the PEL.
- Once corrective actions have been taken, mine operators must conduct sampling and implement additional or new corrective actions until a subsequent sampling result indicates miner exposures are at or below the PEL.

## SECTION 60.14 – RESPIRATORY PROTECTION

- At MNM mines, operators must use respiratory protection as a temporary measure when miners must work in concentrations of respirable crystalline silica above the PEL while:
  - Engineering control measures are being developed and implemented; or
  - It is necessary by the nature of work involved (for example, occasional entry into hazardous atmospheres to perform maintenance or investigation).
  
- Upon written determination by a physician or other licensed health care professional (PLHCP) that an affected miner is unable to wear a respirator, the miner must be temporarily transferred: either to work in a separate area of the same mine; or to an occupation at the same mine where respiratory protection is not required.
  - The affected miner must continue to receive compensation no less than the regular rate of pay prior to the transfer; and may be transferred back to the miner's initial work area or occupation when temporary use of respirators is no longer required.

## SECTION 60.14 – RESPIRATORY PROTECTION (CONT'D)

### Respiratory Protection Requirements at All Mines

- Affected miners must be provided with a NIOSH-approved atmosphere-supplying respirator or NIOSH-approved air purifying respirator.
  - Particulate protection classified as 100 series or High Efficiency (HE) [Examples: half mask elastomeric respirator with N-, R-, P-100 series filtration or powered air purifying respirators with HE filter.
- When approved respirators are used, mine operators must have a written respiratory protection program that meets the following requirements in accordance with ASTM F3387-19 Standard Practice for Respiratory Protection:
  - Written standard operating procedures;
  - Medical evaluation;
  - Respirator selection;
  - Training;
  - Fit testing;
  - Maintenance, inspection, and storage

## SECTION 60.15 – MEDICAL SURVEILLANCE

### MNM Medical Surveillance Program

- Mine operators must provide medical exams at no cost to miners.
- Medical exams by a physician or other licensed health care professional (PLHCP) or specialist must include:
  - Medical and work history
  - Physical exam with special emphasis on the respiratory system
  - Chest X-Ray
  - Occupational history and symptom assessment
  - Pulmonary function test

## SECTION 60.15 – MEDICAL SURVEILLANCE (CONT'D)

### Timing of MNM Medical Surveillance

- Provide medical exams to new miners who start work after the effective date, within 60 days of beginning employment.
  - 1st follow-up exam no later than 3 years.
  - 2nd follow-up no later than 2 years if the 1st follow-up exam at 3 years shows evidence of decreased lung function.
  
- Provide medical exams to current miners (who are already employed and working).
  - During an initial 12-month period and every 5 years thereafter.

## SECTION 60.16 – RECORDKEEPING

- Mine operators must retain:
  - Sampling, periodic evaluations, and corrective actions records for at least 5 years.
  - Written records of a PLHCP's determination that an affected miner is able or unable to wear a respirator, for the duration of a miner's employment plus 6 months.
  - Written records of medical opinions by the PLHCP or specialist that include: the date of the medical examination performed for a miner; a statement that the examination has met the requirements of section 60.15; and any recommended limitations on the miner's use of respirator, for the duration of a miner's employment plus 6 months.
- Operators must promptly provide access to any of these records, upon request from an authorized representative of the DOL Secretary, from miners, or from an authorized representative of miners.