Neighborhood Meeting Agenda May 11, 2016

- GRLA Visual screening
- GRL and GRLA Sound mitigation
- Lighting
- Heating Plant
- Agreement
GRLA Visual Screening

- **Painting**
  
  *As an alternative to screening, Mines may paint the mechanical equipment to blend with the background colors.*

  - Outcome: Mines will paint the mechanical equipment a color that blends with background colors for most of the year.

- **Landscaping**
  
  *Mines is considering planting dense conifer trees (pine or spruce) on the perimeter of the site.*

  - Outcome: Mines will plant a mixture of large conifers and deciduous trees to screen the building and mechanical equipment.

- **Fence Screening**
  
  *In conjunction with acoustic recommendations, Mines is considering erecting a screen if it will mitigate sound.*

  - Outcome: Screening of the mechanical deck imposes a large mass on the backdrop that makes the building appear larger and taller and per the acoustic engineer, the noise impact to the neighborhood is minimal.
Landscape Screening Summer 2016
Landscape Screening Summer 2021
An acoustic engineer is engaged to study the source noise coming from the mechanical deck, GRL and provide recommendations for sound mitigation.

- Outcome: Study is complete.

Early data shows the source of sound that may be the most bothersome comes from a high frequency sound emitted from an air control device and not from the exhaust fans.

- Outcome: VFD was adjusted and the high frequency noise appears to have been eliminated.

The acoustic engineer will provide sound level readings around the neighborhood and compare them to levels with the mechanical equipment off.

- Outcome: Sound levels were measured in the neighborhood on two different nights; March 25\textsuperscript{th} and April 22\textsuperscript{nd} between 12:30 a.m. and 3:30 a.m. Measurements were taken with all equipment off to establish a baseline and different options were measured with mechanical equipment off and on. On March 29\textsuperscript{th} measurements were taken during the day with the equipment \textit{all on} to measure the effect of the GRL fan speed reduction.

Early testing by CPC suggests the levels with the mechanical equipment running are \textit{\sim}50 dB along Maple Street and 12\textsuperscript{th} Street compared to readings taken at 3:00 a.m. which were \textit{\sim}47 dB.

- Outcome: The acoustic study supports these early tests.
Preliminary observations suggest that a reduction of the high frequency noise may mitigate the problem.

Outcome: The VFD was adjusted and the reduction of the high frequency noise appears to have eliminated the objectionable sound

Measures taken:
- Lowered the fans speeds on GRL and GRLA
- Adjusted the VFD which appears to have eliminated the high frequency sound
- Measured sound levels and reduction of sound levels
The equipment scenarios for the early morning March 25 measurements are identified as follows.

**All off)** all rooftop equipment on GRL and GRLA turned off. This condition is used to determine the background noise levels

**Scenario 3a)** GRLA small Lab exhaust fan & MAU on, GRL rooftop equipment off

**Scenario 3b)** GRLA Gen Exh fan & MAU on, GRL rooftop equipment off

**Scenario 3c)** GRLA Gen Exh fan, small Lab Exhaust fan & MAU on, GRL rooftop equipment off

**Scenario 4d)** GRL Gen Lab Exh Fans on, MAU on, Lab Exhaust fan off, GRLA rooftop equipment off

**Scenario 4f)** GRL Gen Lab Exh Fans on, MAU on, Lab Exhaust fan on, GRLA rooftop equipment off

**All on)** all rooftop equipment on GRL and GRLA was on.
3 dBA is the threshold of noticeable sound change
Sound Mitigation

**Outcomes from sound level readings**

- **March 25** baseline was established with *all equipment off* between 36 dBA – 39 dBA
  - The difference with *all equipment on* ranged from 3 dBA (quieter) to 11 dBA

- **March 29** measurements were taken during the day to determine effect of fan speed reduction to the GRL fans. These readings were taken at location 2 & 7. At location 2 there was no change. This indicates that the GRL exhaust fan does not add to the level of sound at this location. At location 7 the sound was reduced by 3 dBA.

- **April 22** baseline was established with *all equipment off between* 38 dBA to 43 dBA
  - The difference with *all equipment on* ranged from -1 dBA (quieter) to 7 dBA
  - 3 dBA is threshold at which the human ear can discern a change in volume.

**Exhaust silencers recommended for GRL and GRLA fans** – initial review of silencers shows that they will raise the height of the stacks by 7 feet. Mines continues to look for other options.
Lighting

Measures taken:

- Shrouds on all LED parking and street lights.
- Reduced field light levels on May 5th. Testing planned for week of May 8th.
- Turned off stadium parking lot lights after 10 p.m.
- Looking at feasibility of deeper shrouds for southeast stadium parking lot.
Heating Plant

- Complete acoustic study – May 23rd
- Address noise sources
  - Building
    - Evaluate sound levels to determine if mitigation is required.
  - Generator
    - Evaluate sound levels to determine if mitigation is required.
    - Generator will only run during electrical outages and during tests
    - Tests once per week, schedule during the day
Mines/City Agreement

- Initial meeting held with Mines, City Manager, and staff.
- Second meeting scheduled to bring together concepts/content for agreement.
- Drafting will take place.
- Input will be sought from the Golden community.
Next Steps

- Install landscaping and paint stacks summer 2016
- Look at further options to mitigate noise
- Evaluate reduced field lighting
- Evaluate Heating Plant acoustic study, once complete
- Draft Mines/City agreement