

Colorado School of Mines
42nd Intercollegiate Mining Competition
Competition Information and Registration Packet



Introduction

The Colorado School of Mines Mining Competition Team would like to invite you to the 42nd Intercollegiate Mining Competition. The competition is set to be held the 18th-21st of March 2020 in Central City, Colorado.

The Intercollegiate Mining Games began in 1978 as a commemorative event in memory of those who lost their lives in the Sunshine Mine disaster of 1972 in which 91 miners lost their lives. Working to ensure those who have lost their lives in the mining industry are never forgotten, the Intercollegiate Mining games hosts a friendly competition of historical mining events. We are proud to host the 42nd Intercollegiate Mining Games and welcome you to Central City, the "Richest Square Mile on Earth".

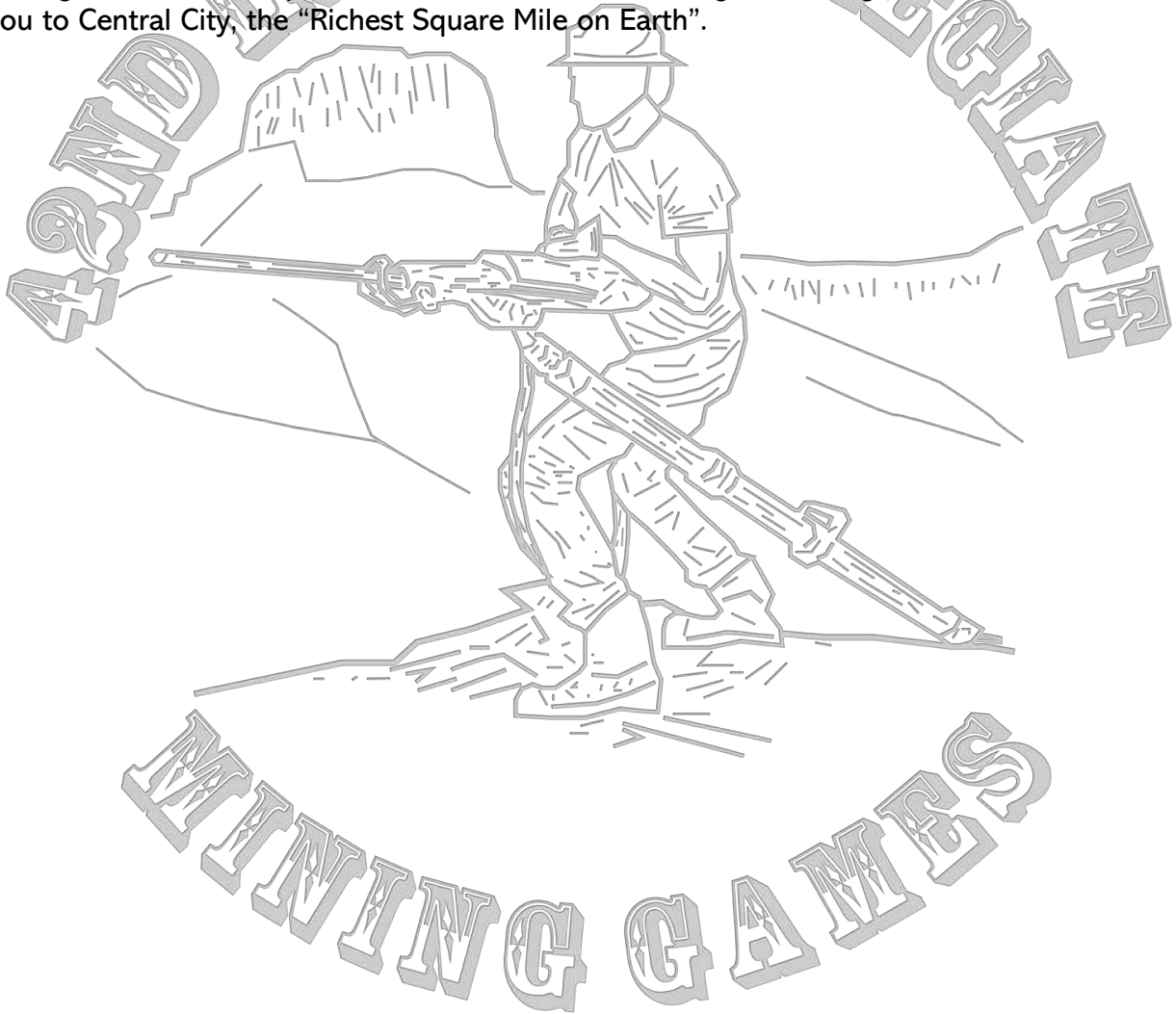
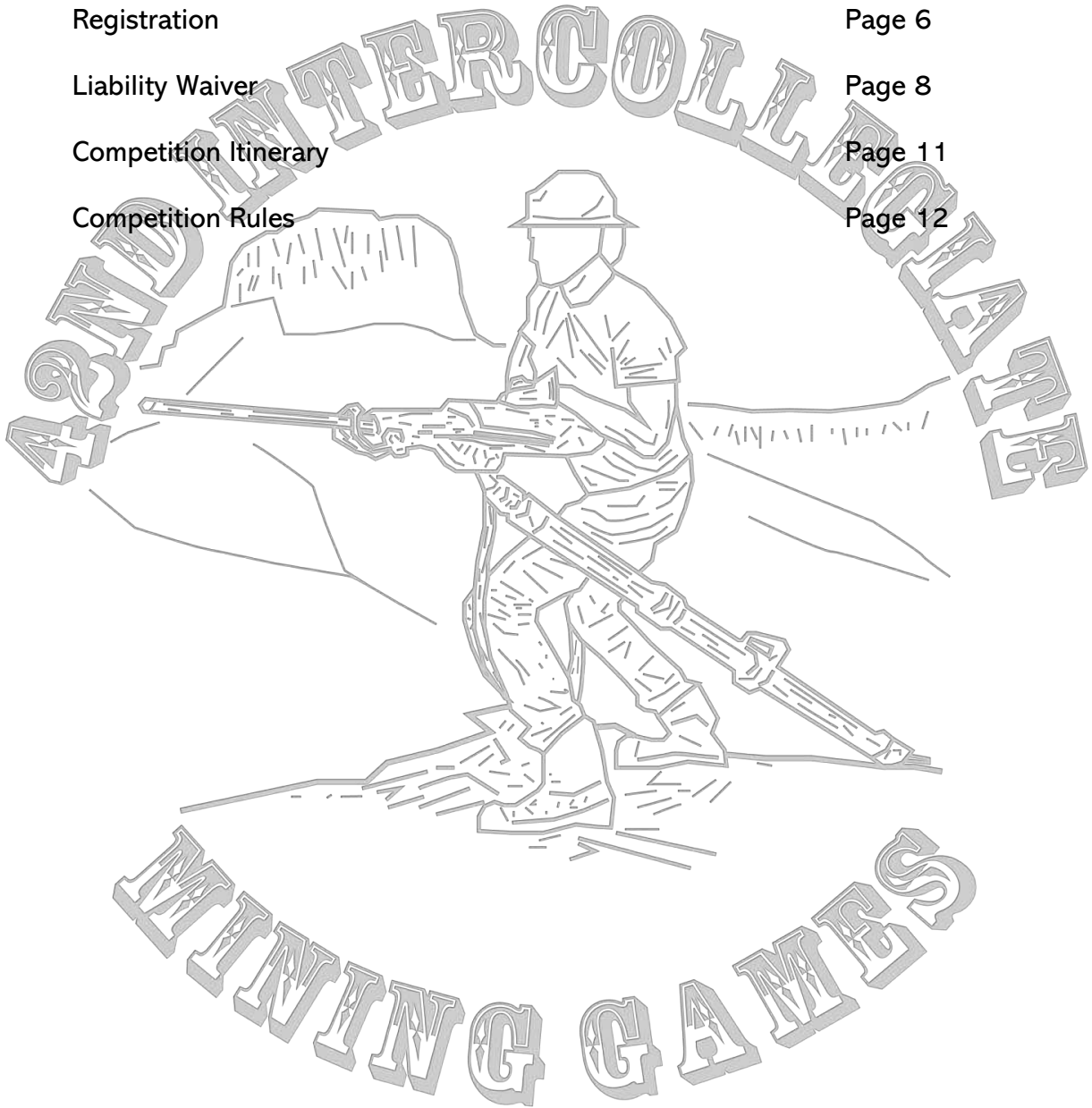


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Instructions

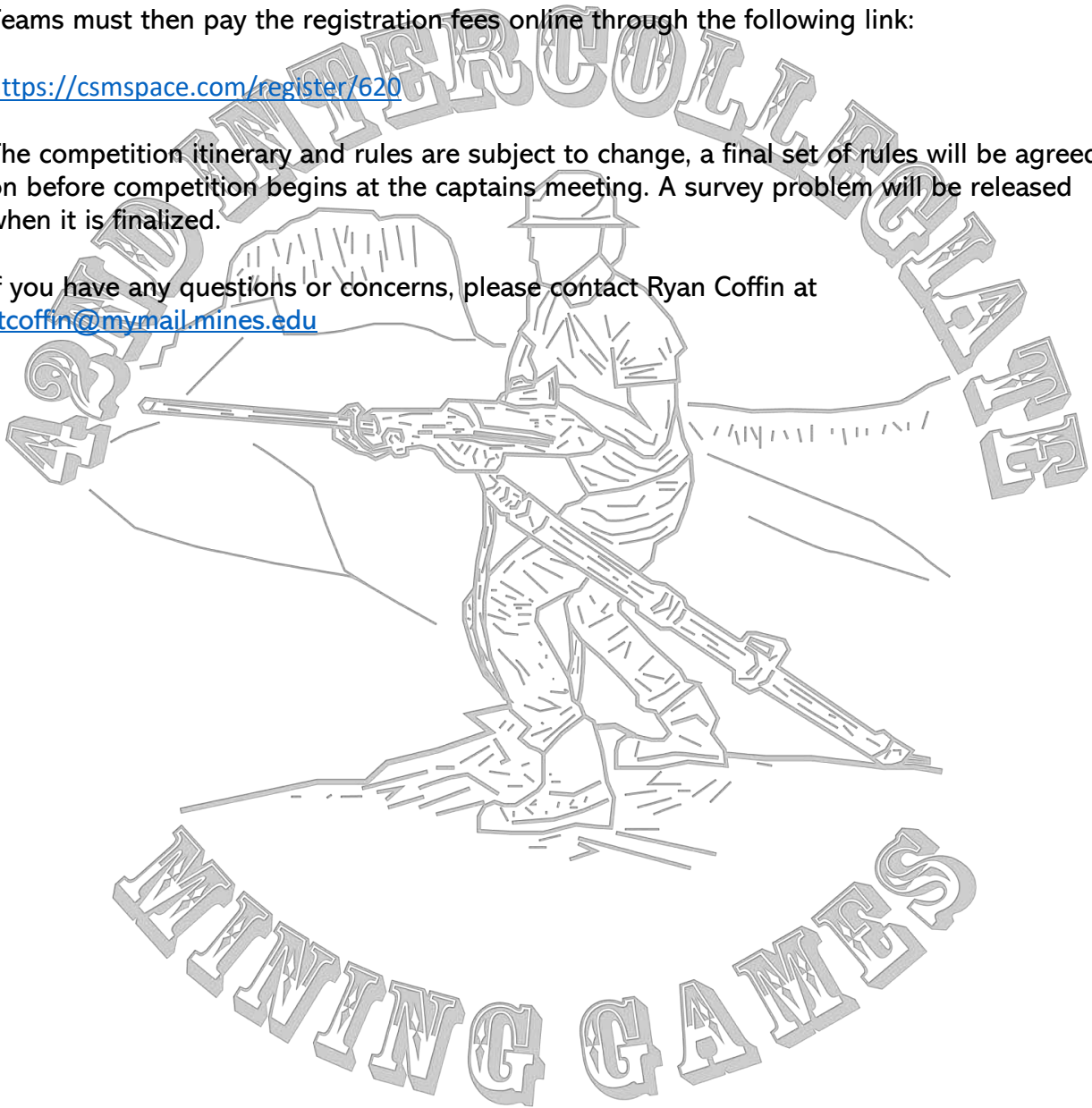
This packet includes information pertaining to the 42nd Intercollegiate Mining Competition, for teams participating in the competition. The registration packet is to be completed for each team a school/organization sends. Once completed the registration packet should be scanned and emailed to rtcoffin@mymail.mines.edu.

Teams must then pay the registration fees online through the following link:

<https://csm.space.com/register/620>

The competition itinerary and rules are subject to change, a final set of rules will be agreed on before competition begins at the captains meeting. A survey problem will be released when it is finalized.

If you have any questions or concerns, please contact Ryan Coffin at rtcoffin@mymail.mines.edu



About Central City, CO

Central City holds a significant place in the history of mining in Colorado. With John H. Gregory's discovery of the Gregory Lode in 1859, the "Richest Square Mile on Earth" grew rapidly to a population of 10,000. With a town full of miners in search of their fortune, many additional Lode deposits were discovered in the gulches surrounding Gregory's Gulch. The next major advancement for mining in Central City didn't come until Professor Hill's discovery in 1865 when he developed a smelting process to separate gold, copper, and silver from sulfide ore. Hill founded the Boston & Colorado Smelting Company in Black Hawk in 1867, allowing the region to produce copper, silver, and gold concentrate. The introduction of a smelting company to the region helped bring another boom and provided for the construction of additional infrastructure in the city.

Many buildings built in the 1870's are still standing in Central City today, along with many other pieces of its mining history. Tailings, old buildings, and if you look hard enough, old mine portals and shafts can be found surrounding the city. While mining has fluctuated with the price of gold and silver, the history of the town remains. Many historical attractions remain in Central City, some of which are outlined below:

[Gilpin History Museum](#)

Located at 228 East 1st High Street above Johnny Z's Casino this Museum features historical artifacts relating to the history of Gilpin County and Central City. Opened in 1971 the museum features a room dedicated to the history of mining in the region.

[Central City Opera House](#)

The Central City Opera House is located at 124 Eureka St, which is a half of a block North of the Teller House. The Central City Opera House is the oldest operating opera house in the U.S., opened in 1878.

[Teller House](#)

Historically a hotel, the teller house now serves as a restaurant. Located on Eureka Street, downtown Central City the Teller House is home to the "Face on the Barroom Floor". The Teller House opened in 1872, displaying the architecture brought by mining booms of the past.

[Hidee Mine](#)

The Hidee Mine is a gold mine located in central city. While it is now dedicated to education and tours, the mine long served as an operational gold mine. The mine's patent was applied for in 1896, originally access from a shaft. Later, an adit was driven for walk-in access to the mine.



Registration

The following is to be filled out by the lead/organizer for your school's team(s) for the 42nd Intercollegiate Mining Competition:

Main/Lead Contact

Title: _____ First Name: _____ Last Name: _____

University/Organization Name: _____

Address: _____

Phone Number: _____ Email: _____

Alternate Phone While in U.S. (If Applicable): _____

Alternate Contact

Title: _____ First Name: _____ Last Name: _____

Phone Number: _____ Email: _____

Alternate Phone While in U.S. (If Applicable): _____

Team(s) Information

Total Number of Teams: _____

Men's: _____ Women's: _____ Co-ed: _____ Alumni: _____



Registration

The following is to be filled out by the team members for your school/organization. Please print an additional copy of this page for each team your school/organization will have in attendance.

Team Name: _____

Division (Circle): Men's Women's Co-Ed Alumni

Team Captain Name: _____

Team Captain Email: _____

Team Member Information:

	First Name	Last Name	Gender	Date of Birth	Shirt Size
1					
2					
3					
4					
5					
6					

Coaches/Advisors:

	First Name	Last Name	Gender	Date of Birth	Shirt Size
1					
2					

The Cost of attendance is \$700 per team (of 5 or 6 team members) with an additional fee of \$150 per coach/advisor attending.

Notes (include dietary restrictions, medical needs, etc.): _____



Liability Waiver

The following pages contain a liability waiver. The waiver must be printed, signed, scanned, and emailed to rtcoffin@mymail.mines.edu. One copy of the waiver must be completed for each participant.



COLORADO SCHOOL OF MINES

READ THIS DOCUMENT COMPLETELY BEFORE SIGNING. BY SIGNING THIS DOCUMENT, YOU RELEASE COLORADO SCHOOL OF MINES FROM ANY LIABILITY RESULTING FROM YOUR PARTICIPATION IN THE ACTIVITY LISTED BELOW AND WAIVE ALL CLAIMS FOR DAMAGES AGAINST THE COLORADO SCHOOL OF MINES

The undersigned person (hereafter referred to as “Participant”), _____ (*print name*), wishes to participate in the 42nd Intercollegiate Mining Games (*name of activity*) (hereafter referred to as “the Activity”) sponsored by the Colorado School of Mines and the Colorado School of Mines Mining Competition Team (*name of sponsor, if applicable*) on March 18 through March 21, 2020 (*Date of Activity*).

In consideration of Colorado School of Mines making arrangements for and permitting and assisting Participant to take part in this Activity, the undersigned Participant and Parent or Guardian, if appropriate, agree to hold harmless, release, indemnify and forever discharge Colorado School of Mines and the Colorado School of Mines Mining Competition Team, and the Board of Trustees of the Colorado School of Mines, its officers, directors, employees, agents, and any persons acting on their behalf, as well as their heirs, executors and assigns from and against any and all liability, claims, demands, costs and expenses (including attorneys’ fees) arising out of or in any way connected with any bodily injury or property damage in any way relating to or arising out of my participation in the Activity, even if the liability, claims, demands, costs and expenses may arise, in whole or in part, out of the negligence or carelessness of the persons or entities mentioned above.

The Participant and Parent or Guardian are aware that the Activity may include certain risks and dangers. The Participant and Parent or Guardian understand that specific risks vary depending on the level and nature of the Activity, and can range from minor personal injuries such as scratches, bruises, and sprains to major injuries such as eye injuries and back or joint injuries to catastrophic injuries resulting in paralysis or death. Risks of this Activity include, but are not limited to, the following:

1. Traveling to and from the Activity.
2. Manual labor, including:
 - Mucking - The event requires each team to run an empty ore car down the track and back to the start. Then the team must muck two tons of “ore” into the car, with only two team members mucking at any one time;
 - Handsteel - Each of 5 team members must drill for two minutes using either a 4 or a 3lb hammer;
 - Swede saw - Requires each team member to cut through a 6”x6” piece of lumber using a bow saw;
 - Goldpan - Each team member uses traditional goldpan methods to retrieve 5 pellets;
 - Track stand - The teams competing in the old-fashioned version are required to build and tear down a 15’ section of rail as quickly as possible. Four competitors from each team perform the work while one team member acts as crew boss and shouts instructions to ensure the rail is constructed correctly. After the rail is set up, the judges check it for mistakes. The rail must be to gauge, the spikes must be driven home and the fish plates must be bolted tightly to the standing rail. When the judges have checked the set up, the team tears down the rail as quickly as possible and the total time for set and tear down is recorded as the team score;
 - Jackleg drilling - The jack legging event requires only two team members. Each one must drill holes in a block of concrete using an air powered jackleg drill. Each competitor gets 3 minutes to drill as deeply as possible, at which point the air is turned off; and
 - Survey, surveying is the least physical and most time consuming event in the competition. Again, only two team members are required to compete in this event. The team is given a start point with known coordinates and a back sight azimuth. The team is required to survey, using a one minute engineers transit and steel tape, the position of an end point about 300 feet away. The team must set at least one turning point during the survey. The total time allowed for the survey is 45 minutes and then the team has 15 minutes to complete their calculations and hand in their final coordinates. — individuals should be aware of their own physical limitations.
3. Inclement weather that can impact safety (rain, cold, wind, heat).
4. Steep slopes, uneven terrain, loose rocks and gravel, slippery conditions; and
5. Working with or in near proximity to other event participants or volunteers from organizations outside of Mines.

**RELEASE AND WAIVER OF COLORADO SCHOOL OF MINES FOR ALL ACTIVITIES
RELATED TO 42nd INTERCOLLEGIATE MINING GAMES (continued)**

By signing this agreement as Parent or Guardian, I am consenting to Participant's participation in the Activity and acknowledge that I understand that any and all risk, whether known or unknown, is expressly assumed by me and all claims, whether known or unknown, are expressly waived in advance.

The Participant and Parent or Guardian understand and assume all the dangers and risks associated with this Activity and waive all claims or causes of action arising out of Participant's involvement in this Activity. To the best of their knowledge, Participant and Parent or Guardian are not aware of any mental or physical disability or health-related reasons or problems that would hinder or otherwise prevent Participant from safely participating in the Activity. Participant and Parent or Guardian understand that they are solely responsible for any costs arising out of any bodily injury or property damage sustained through or arising from Participant's involvement in the Activity.

Participant and Parent or Guardian expressly agree that this Liability Waiver Form is intended to be as broad and inclusive as permitted by the laws of the State of Colorado, and that if any portion herein is held to be invalid or unenforceable, the balance shall continue in full legal force and effect. Participant and Parent or Guardian have carefully read this Liability Waiver Form, understand the contents herein, and are executing it voluntarily of their own free will. Participant and Parent or Guardian have had sufficient time to review and seek explanation of the provisions above, have carefully read them, understand them fully and agree to be bound by them.

Nothing in this agreement shall be construed to waive, limit, or otherwise modify any governmental immunity available to any of the persons or entities released herein under the Colorado Governmental Immunity Act, §24-10-101, et seq., C.R.S.

Signature of Participant

Date

Signature of Participant's Parent or Guardian
(if Participant is a minor)

Date

Competition Itinerary

Wednesday March 18th, 2019

- Travel/Check-in day
- Hideo mine tours available, more information to come
- Welcome banquet at w/ event registration – Time and Location TBD

Thursday March 19th, 2019

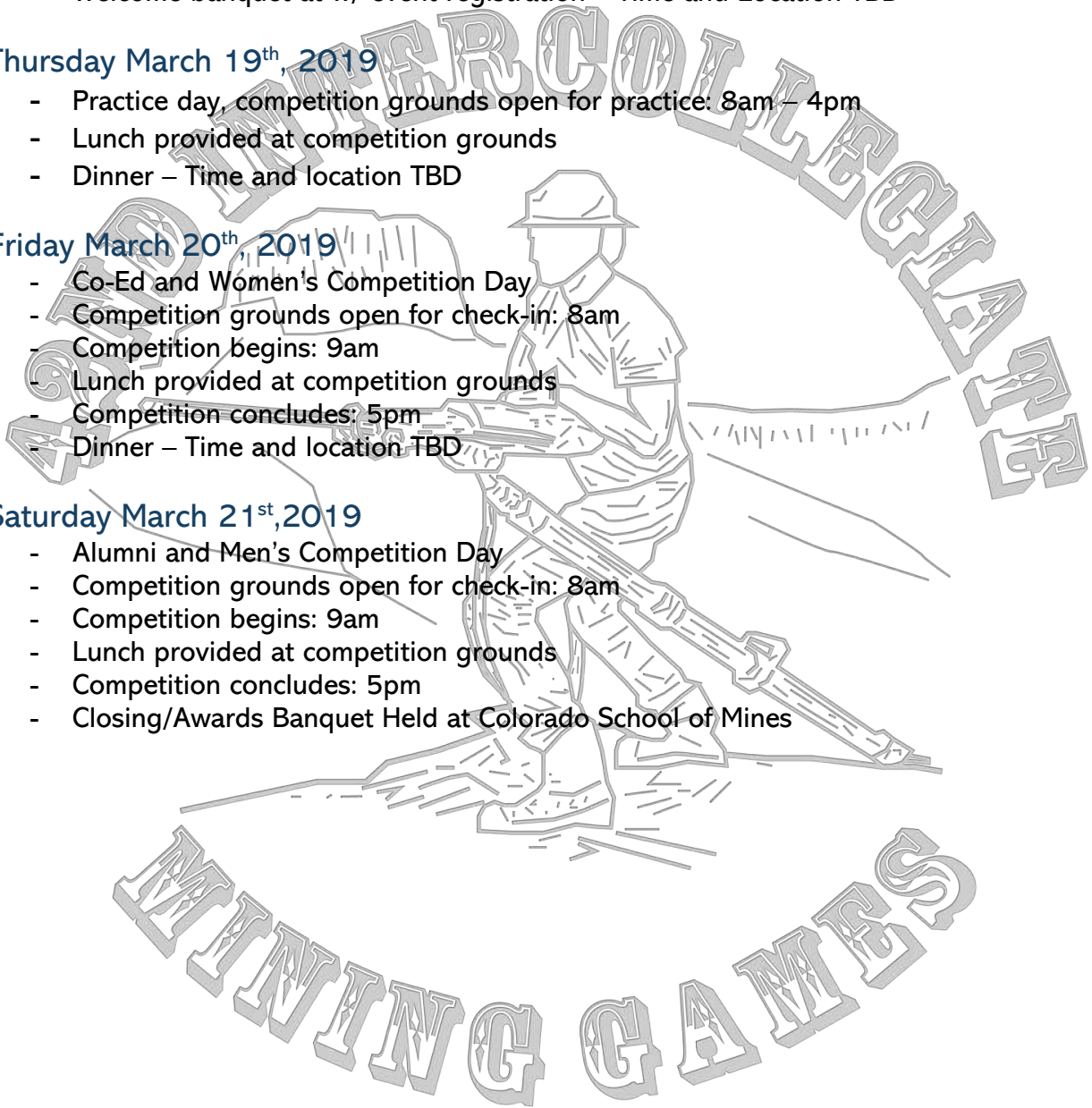
- Practice day, competition grounds open for practice: 8am – 4pm
- Lunch provided at competition grounds
- Dinner – Time and location TBD

Friday March 20th, 2019

- Co-Ed and Women's Competition Day
- Competition grounds open for check-in: 8am
- Competition begins: 9am
- Lunch provided at competition grounds
- Competition concludes: 5pm
- Dinner – Time and location TBD

Saturday March 21st, 2019

- Alumni and Men's Competition Day
- Competition grounds open for check-in: 8am
- Competition begins: 9am
- Lunch provided at competition grounds
- Competition concludes: 5pm
- Closing/Awards Banquet Held at Colorado School of Mines



Official Rules

Safety Regulations

It is each competitor's responsibility to ensure that they are complying with safety rules and regulations for each event. Any instruction given by a judge should be followed, it is the duty of each competitor to reach, understand, and follow all listed safety regulations. If the competitor feels as though they cannot comply with safety regulations, they should seek out another competitor from their team to participate in the event.

The competition grounds will be segmented, through barriers, into competition areas and general areas. Spectators are allowed in general areas and PPE is not required. In the competition areas only competitors and judges/volunteers will be allowed, PPE for each respective event is required within these areas for competitors and judges/volunteers.

General Safety Requirements:

All competitors are required to wear steel toe boots, long pants, and a short/or long-sleeved shirt at all times at the competition grounds. Steel toe boots, pants, and shirts are to be brought/provided by the competing team or individual competitors. Other PPE required for each event is listed in the description for each event. PPE will be available at the event. Teams are encouraged to bring their own PPE, however it will be inspected along with steel toe boots at the beginning of competition. Should a competitor lose an article of PPE while competing, they must stop and replace it before continuing.

Failure to comply with competition safety rules and regulations may result in a disqualification of the competitor in an event or the games as a whole, at the discretion of the judges.



Team Competition

Each team should consist of a minimum of 5 competitors and a maximum of 6. The following events require 5 competitors; Gold Pan, Swede Saw, Hand Mucking, Hand Steel, and Track Stand. Two competitors are required to compete in Survey, three members must be present for the Jackleg event.

Teams will compete in one of the following categories:

Men's
Women's
Alumni
Co-Ed

Co-Ed teams must have at least two female competitors competing in any given 5-person event and at least one female competitor in the Survey and Jackleg events. Competitors may only compete on one team, institutions will not be allowed to compete with more than one co-ed team unless they have a women's team.

Personal Equipment

Teams will be permitted to bring any equipment they wish to use in competition excluding jackleg drills. Any personal equipment brought by individual teams must be made available for use by any/all other teams at competition.

Any personal equipment must be checked in at the beginning of practice day, in which it will be inspected for safety. Once inspected, equipment must not leave the competition site and must be stored on site for the duration of the competition. Should a piece of equipment become damaged it will be removed from use. The owner will have the option to repair damaged equipment and have it re-inspected to be used for competition again.

Mines, Central City, and any other organizing parties are not to be held responsible for damage to or loss of equipment. Each team assumes the risk of bringing their personal equipment to the competition.

Judges and organizers have the final say on what personal equipment is deemed safe for competition use.



Scoring

Points will be awarded to each team for each event completed. If a team is disqualified, they receive last place points +1 for that event. Points will be awarded in terms of the teams place within their DIVISION. The first place team for each event shall receive one point, the second place team two points, etc.

For an example of this system, see below: • Consider two teams, A and B:

o Team A:

- 1st place in 4 events @ 1 point each = 4 points
- 2nd place in 3 events @ 2 points each = 6 points
- Total = 10 points

o Team B:

- 1st place in 3 events @ 1 point each = 3 points
- 2nd place in 4 events @ 2 points each = 8 points
- Total = 11 points

o Team A is the Winner

Should two teams have the same first through third place final combined score, a tiebreaker will be applied. The tie-breaking event will be the event with the closest time or measurement between the two teams (measured on a percentage basis of the combined measurement or time of the two tied teams). The two teams will re-compete in that event, and the winner will take the higher place. E.g. in a tie between 2 teams for 2nd place, the winner of the tiebreaker would take 2nd place, and the loser 3rd or 4th depending on the 3rd place score.

NOTE: In order to compete in the tiebreaker, the teams must be present at the final score tally to be conducted at the conclusion of the day's events. If a team is not ready to re-compete within 30 minutes of this tally, they will forfeit the tiebreaker. In the event of insufficient time, and at the discretion of the Judges and the Event Organizer, each competition event shall be put into a hat, and the head judge shall draw out the deciding event, from which the winner shall be chosen based on individual event position.



Event Rules

Swede Saw

PPE Required:

- Steel Toe Boots
- Safety Glasses
- Hard Hat
- Gloves are recommended

Five (5) members from each team will participate in this event. Using two 36-inch bow saws, competitors will alternate cutting through a 6-inch by 6-inch timber. The cumulative time will be used for scoring. The team with the fastest time wins the event.

Time will start once the first competitor's blade comes in contact with the timber. When one competitor finishes sawing the timber, the next competitor may begin sawing. There may only be one saw in contact with the block of timber at a time. The time will end when the fifth competitor completely saws through the timber.

Each team will be given a 28-inch timber, divided into seven, 3-inch sections. Two sections may be discarded at the discretion of the team. Sections may be discarded due to poor quality, knots, or any other reason the team decides on. The discarded sections will be denoted by an 'X' through that section.

One spare bow saw will be available in the event that one of the two breaks. Teams will have the option to replace one blade before time starts. Should a blade break during the competition, the clock will continue to run while the saws are swapped. Once the saw is swapped, the competitor may continue with the same cut. If the previous competing team broke a blade, the blade will be replaced by the judge and will not count towards the following team's blade replacement.

After the team competes, they are required to pick up their cut blocks and discard them in the designated pile. If a competitor breaks out of his/her designated 3-inch section, he or she will be advised by the judge to re-start. If the two discarded blocks, marked with an 'X', have not yet been cut away, a competitor will be allowed to cut into a section marked with an 'X'. Should this happen a second time, the team will be disqualified. If the piece being cut breaks away from the main timber, the competitor must continue to saw off what is remaining before the next person can begin.

Penalties:

- | | |
|----------------------------|------------------|
| - Hitting timber with saw | + 1 min |
| - 2 "break outs": | Disqualification |
| - 2 saws contacting timber | Disqualification |



Hand Mucking

PPE Required:

- Steel Toe Boots
- Safety Glasses
- Hard Hat
- Gloves are recommended

Five members from each team will compete in this event, three of which will be muckers, and two will be screeders. The team will be given a 10-minute time period to prepare the muck pile before time is started. After this time, no member of the team may not touch the muck pile until the event time is started. This includes muckers situating themselves on the top of the muck pile. Muckers may however position themselves on/in the muck pile during the 10-minute preparation period.

The event begins by tramping the empty ore cart down the track and back to the muck pile. Muckers may start filling the car once it is returned to the start. The cart must touch the bumper before muckers may begin shoveling. Only two muckers will be allowed to shovel material at any one time. The teams may alternate muckers at their discretion. The two screeders can only touch muck that is within the plane of the ore cart.

The judge will give the indication that the car has been filled and leveled. The full cart is then tramped down the length of the track and back again. Time will stop when the full car touches the bumper at the start of the track, the fastest overall time wins. Penalties are applied at the judge's discretion.

Penalties:

- | | |
|--------------------------------------|------------------|
| - Hitting stopper too hard | + 20 Seconds |
| - Screeders hand mucking into cart | + 20 Seconds |
| - Person in front of moving ore cart | Disqualification |
| - More than two muckers shoveling | Disqualification |
| - Derailing ore car | Disqualification |



Gold Panning

PPE Required:

- Steel Toe Boots
- Safety Glasses

Five members of each team are required for this event. Competitors may choose between types of available pans. Each gold pan will be filled with approximately one coffee can full of material containing 5 flattened BBs (pellets). When a competitor has found all five pellets and placed them into the judges' hand, the competitor will call 'time'. The maximum time to pan is 5 minutes. The cumulative time for all five competitors will be added together with the lowest team time declared winner.

All competitors will start with his or her pan on the lip of the gold pan trough. Once the judge signals timing will start and the competitor will be allowed to pan for the pellets. The competitor is responsible for placing each pellet in the judge's hand. Each pellet that is lost in the panning process or in the process of getting the pellet from the pan into the judge's hand will result in a five-minute penalty. The competitor is responsible for placing each pellet in the judge's hand.

Once a competitor has completed their pan, they may help one another spot pellets. No one may touch another competitor's pan or material else the team will be immediately disqualified from that event. The sixth team member is not allowed to act as a spotter.

This event is intended to be 'wet' panning and the use of 'dry' panning techniques will result in a penalty per occurrence; competitors must submerge their pan before touching or removing any material.

A ten second time period, after the last pellet is placed in the judges hand and the competitor calls time will be used to determine if all pellets are legitimate and not a rock. If it is determined to be a rock and not a pellet the competitors time will continue from the stopped time.

Penalties

- | | |
|---|--------------------------|
| - Lost BB/Pellet | 5 minuets per bb/pellet |
| - Dry Panning | 5 minuets per occurrence |
| - Spotter touches competitor's material | Disqualification |



Surveying

PPE Required:

- Steel Toe Boots

Two members of each team will compete in the surveying event. Transits will be used for the competition. The hosting school (Colorado School of Mines) will provide all required equipment, except calculators and booking sheets. Teams may bring their own calculators and materials (i.e. clipboards, pens etc.). Calculation sheets and non-programmable calculators may only be used. No programmable calculators or mobile/cell phones are permitted.

Judges will inspect survey equipment prior to each use and again at the end. The surveyors are responsible for damages to the equipment while in their possession. While walking to different stations, the transit must be secured back in the box to prevent damage.

Each team will be given their equipment and coordinates of an initial "A" station (Northing, Easting, Elevation) and a back azimuth. Teams will also be given the coordinates of station "B" in addition to a bearing from point "A" to point "B". In addition to this, teams will also be provided a map/drawing to show the order of survey points.

Equipment will be boxed up and secured at the beginning of the event, or while being transported between stations. Judges will record a starting time when the team begins, time will be stopped when the crew has completed its survey and all equipment is boxed and returned to the judge. The judge will check equipment. If not properly stowed, the judge will indicate a problem and time will resume until the problems are corrected. The judge will not specifically identify the problem; it will be the team's responsibility to find and correct the issue. Note that the survey time will be stopped when the equipment is properly secured and the 15 minute calculation time will not start until the team is at the calculation station and ready to begin.

Equipment Provided:

- Theodolite/Transit
- Tripod
- Plumb bob
- Steel tape



Surveying (Continued)

Teams will be ranked by their error according to the total error of closure between their calculated coordinates for their "C" station and the actual "C" station coordinates as determined by the judges. The judge will have the right to disqualify any team who is being reckless with equipment or causing damage to the equipment. Any team intentionally interfering with equipment or survey stations will also be disqualified. Should two teams obtain the same error, the time to complete the measurements and calculations will be taken into consideration to determine the rankings.

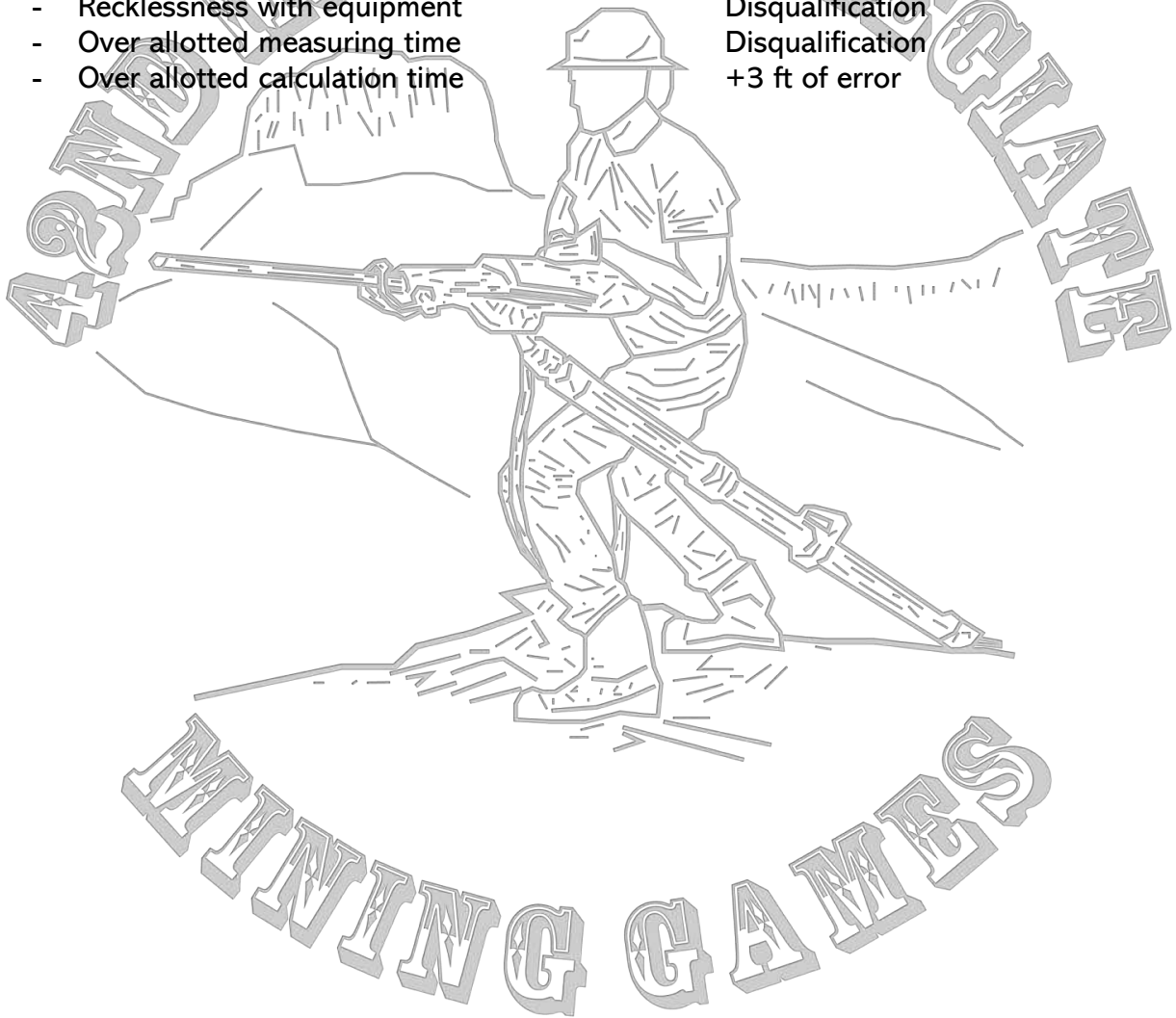
Penalties:

- Recklessness with equipment
- Over allotted measuring time
- Over allotted calculation time

Disqualification

Disqualification

+3 ft of error



Track Stand

PPE Required:

- Steel toe boots
- Safety glasses
- Hard hat
- Gloves are recommended

Four members from each team will compete in the track stand event while the fifth member will act as a coach/foreman for the team. The coach can only give instruction, point out problems, and help keep the team running smoothly. The coach is not allowed to touch any tools or materials. No team member may work on the same tie as someone driving spikes with a double jack/spike maul; the first instance will result in a warning and the second will result in disqualification.

In the Co-Ed division, at least 2 women are required to actively participate in the construction and tear down with at least one being a spike driver (The coach is not considered as an active position).

The teams must install 2, 15 foot lengths of 30lb/yard rail on five ties. The rails must be connected to an existing piece of rail by means of four fishplates with eight bolts. Bolts must be tightened to a minimum torque of 35 foot-pounds. All equipment necessary will be provided, although personal equipment can also be used if also made available to all other teams.

A rail must be held by 4 stakes per tie (1 on each side of each rail). Twenty-one stakes will be given to each team; one stake will be a spare in case of breakage or loss. The track must be kept to gauge along its length with a provided track gauge, which will be made available for teams to use during the event. Due to variations in the rail, the gauge will only be judged at a specific location specified by the judge prior to setup.

Teams will be timed for both the construction and tear down of the track. Prior to time starting, teams will be given ten minutes to level and prepare the ground where the track will be constructed. The coach cannot touch any materials during this time. The teams will then stand behind a designated line with all of their materials and equipment. A judge will indicate time starting and the teams will then be able to bring all of their materials and tools past the line and construct the rail. If any team member travels under or over a piece of elevated rail during the event, the TEAM will be disqualified from the event.

Once the track has been constructed, all members (including the coach) and tools are to be moved behind the line again, and the coach will be required to call 'time' before the judge stops the clock. The coach does not have to remain the same for both the construction and tear down.



Track Stand (Continued)

The teams track will then be inspected for quality and any penalties will be recorded.

Teams will then be timed in the same way on the tear down of the rail section. Teams will not be allowed to elevate the section of rail in order to hit the ties loose; doing so will result in disqualification and possible payments for damages to rails. All materials including tools should be removed behind the line prior to the coach calling 'time' for the tear down. Throwing tools or equipment will result in immediate disqualification, throwing is defined as dropping beyond the straight arm reach of the individual. Any items left on the field will incur time penalties, including pieces of broken ties that are larger than a stake.

During head-to-head competition, competitors have equal right to equipment; and they are allowed to wait if needed to use the equipment if taken by the other team.

Time for construction and tear down of the rails will be added, along with any incurred penalties. The team with the fastest total time wins.

All spikes must be driven completely, any spike with a gap between the dog head and the rail large enough to fit a popsicle stick will incur a penalty.

All ties must be flush with rail, any location where two popsicle sticks can fit will incur a penalty for a hanging tie.

Penalties:

- | | |
|--|----------------------|
| - Traveling under or over elevated rail section | Disqualification |
| - Throwing tools or equipment | Disqualification |
| - Elevating constructed track | Disqualification |
| - 1 st offense working on same tie as double jack | Warning |
| - 2 nd offense working on same tie as double jack | Disqualification |
| - Coach touches equipment/materials | Disqualification |
| - Any item left in front of line | +10 sec / item |
| - Spike not sunk into tie (popsicle stick) | +10 sec / spike |
| - Spike not contacting rail | +30 sec / spike |
| - Bolts too loose | +15 sec / bolt |
| - Spike or fishplates used incorrectly | +30 sec / occurrence |
| - Hanging Tie (2 popsicle sticks) | +20 sec / tie |
| - Improper rail gauge | + 40 sec |
| - Spike not removed in tear down | +20 sec / spike |



Jackleg Drilling

PPE Required:

- Steel toe boots
- Safety glasses
- Hard hat
- Glove on hand not used to collar steel
- Hearing protection
- No loose/baggy cloths
- Long hair and strings must be tied up
- Long sleeve shirts strongly recommended

Two members from each team are required for this event; one driller and one nipper. The drillers will have three minutes each to drill as deep as possible into a high square and a low square. Each square will be 6-inches x 6-inches and will be allocated to teams at random. The teams will drill into the blocks using a 4-foot, chisel bit drill steel. The clock will NOT stop for a stuck steel. The driller and nipper may choose who drills the high and low holes.

Before time is started, the driller and assistant will be allocated 3 minutes to set up the drill and determine the placement of the leg. Before the 3 minutes is up the driller must be behind the designated line with the steel removed from the chuck.

If the driller is male, the nipper must not touch the drill or the steel during the event, the nipper may only help by moving hoses. The nipper is not allowed to help remove the steel by pulling the hoses. If the driller is female, the assistant may help with collaring the hole, by touching the steel. For female drillers, if the assistant makes contact with anything beside the steel or hoses, the longest hole will be deducted from the total length. For the Co-Ed division, each team must have one male and one female driller.

The driller cannot straddle the leg, the air will be turned off each time this happens. The air may be turned off at any time, based on the discretion of the judges with regards to unsafe operations. Hands in pinch points or guards will be considered unsafe operations. If the judges feel at anytime that the competitor is not in control of the jackleg the air will be turned off.

In the event of breaking out of the sides of the block, drilling into another hole, or drilling outside of the designated square, teams will be penalized.

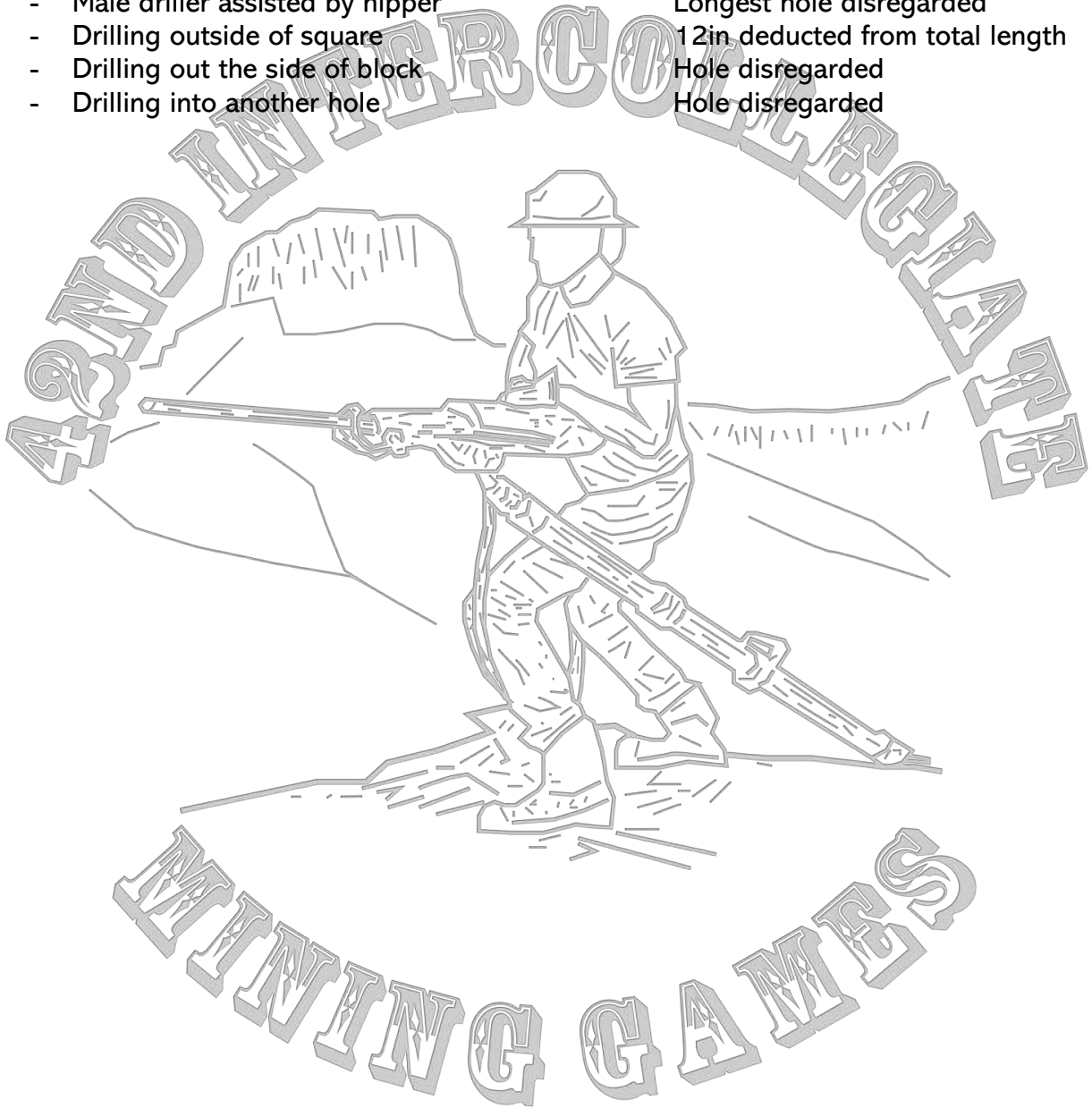
The team that drills the deepest after penalties have been deducted will be the winner. Holes will be measured to the nearest hundredth of an inch.



Jackleg Drilling (Continued)

Penalties:

- Unsafe operation of leg
 - Straddling leg
 - Air turned off twice
 - Male driller assisted by nipper
 - Drilling outside of square
 - Drilling out the side of block
 - Drilling into another hole
- Air turned off
 - Air turned off
 - Disqualification
 - Longest hole disregarded
 - 12in deducted from total length
 - Hole disregarded
 - Hole disregarded



Hand Steeling

PPE Required:

- Steel toe boots
- Safety glasses
- Hard hat
- Gloves highly recommended

Five members from each team are required to compete in this event. Each member will be given two continuous minutes (total time of 10 minutes per team) to drill as deep as possible into a 4x4-inch square painted on a concrete block.

The steels and hammers will be provided for this event. A set of three drill steels will be provided. The steels will have a maximum length of twelve inches. Steels must have the appropriate chisel width to create a 7/8th inch diameter hole within a tolerance of 1/16th of an inch. While steels and hammers will be provided, personal steels and hammers are also allowed, providing they are also made available for all other teams. The drilling medium will consist of concrete blocks.

Water may be used to flush the holes while drilling. After the last member has finished, the team will have one minute to flush the holes and remove chips. Plugs will be provided to prevent chips from entering completed holes.

Male competitors will be required to use a 4-pound hammer, while female competitors may use either a 3-pound or 4-pound hammer.

Should a team drill into a neighboring hole, that hole's length will not be counted. It is required that the team starts a new hole, time will not be restarted. All competitors will be required to hold the steel while it is being struck with the hammer. The judge will indicate when the steel is not held properly the first time. On the second offense, the competitor will be disqualified and must forfeit the remainder of his/her time. Should a team member strike the side of the steel with a hammer they will be disqualified. The next member will be required to take over drilling and the team will forfeit the remaining amount of time for the disqualified member. The clock will stop if a judge is to disqualify a member of the team. This is to explain and allow transition to the next member in the event they are not ready.

If the judges feel that a competitor is not in control of the hammer the competitor will be given a warning and if control is not attained, then the judge has the authority to disqualify the competitor. Time will stop to allow the next team member to transition.



Hand Steeling (Continued)

All holes will be measured from the surface of the concrete block to the base of the hole to the nearest 1/32nd inch. The deepest total length wins.

Penalties:

- 1st offense: steel not held when struck Warning from judge
- 2nd offense: steel not held when struck Disqualification of competitor
- Striking side of steel with hammer Disqualification of competitor
- Steel stuck in hole after 1 min flush Hole not counted

