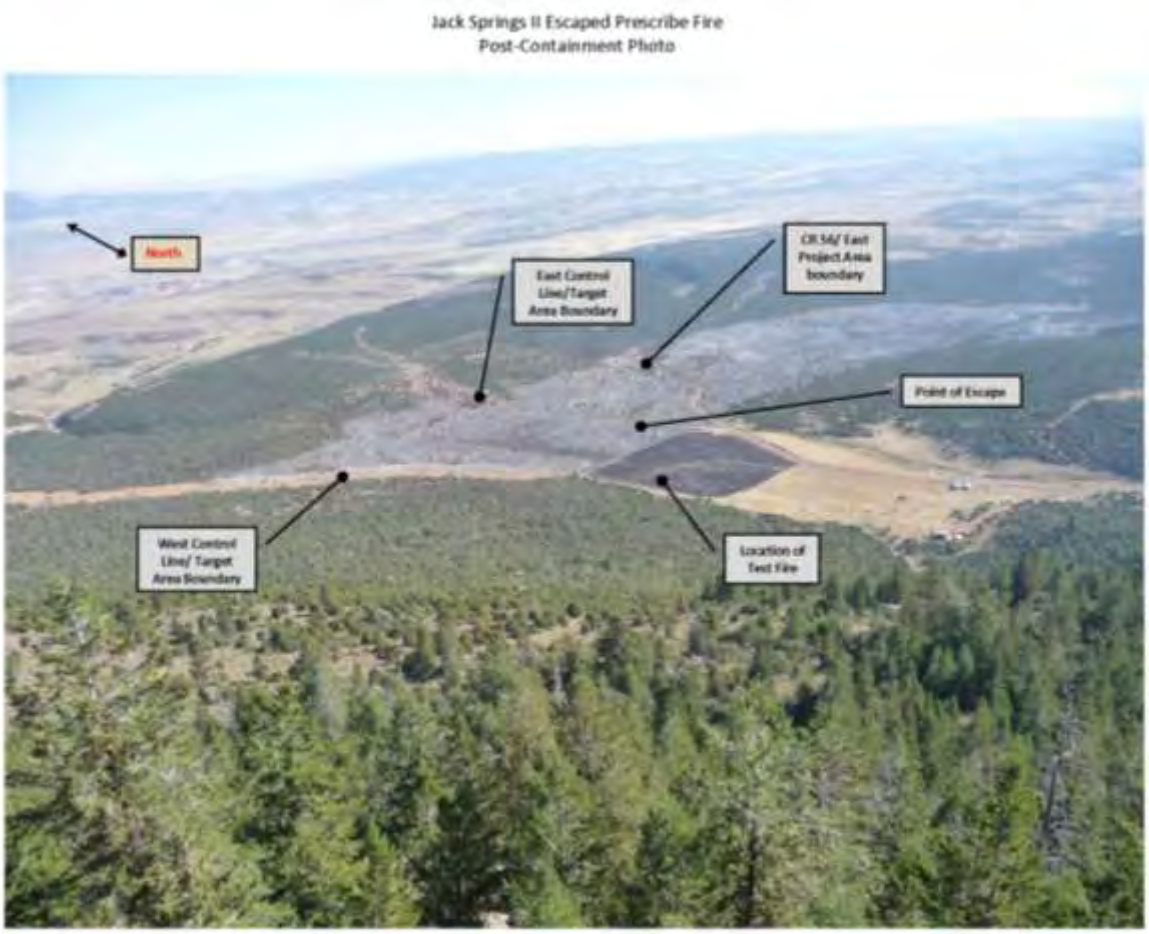



# Jack Springs II
# Escaped Prescribed Fire Report

CO-CRD-LSFO
September 28-October 5, 2010

# Jack Springs II Escaped Prescribed Fire Report

## Purpose of the Review

As per the *Interagency Prescribed Fire Planning and Implementation Procedures Guide*, "All prescribed fires declared a wildfire will have a review initiated by the appropriate level Agency Administrator. The level and scope of the review will be determined by agency policy."

The Jack Springs II Prescribed Fire escaped the project planning area on the afternoon of September 28, 2010, and was declared a wildfire. The BLM Northwest Colorado District, Little Snake Field Office, and Colorado State Office determined that a local level review would be convened.

The review team was given a delegation of authority from the Northwest Colorado District Manager on October 5, 2010. The delegation of authority directed the review team to evaluate the circumstances associated with the planning and execution of the Jack Springs II Prescribed Fire in the Little Snake Field Office, and determine whether or not policy, guidance, and procedures were followed.

The review team was directed to analyze the factual information to determine:

- If the prescribed Fire Plan was adequate.
- If the prescription, actions, and procedures set forth in the plan were followed.
- If overall policy, guidance, and procedures relating to prescribed fire operations are adequate and being followed.
- Whether or not prescribed fire training and experience of personnel involved were commensurate with required standards.
- Actions that should be implemented immediately to prevent similar future occurrences using the principles and cultures of high reliability organizing.

## Review Process and Report Format

The review team arrived in Craig, Colorado on the night of October 4, 2010, and the review team was briefed and presented the delegation of authority at 0800 hours on October 5, 2010. Most interviews were completed on October 5. The review team made a site visit with involved personnel on October 6 and also completed more interviews. The review team compiled commendations, findings, and recommendations and presented a draft report to the Northwest Colorado District Manager and other personnel on the afternoon of October 7.

The *Interagency Prescribed Fire Planning and Implementation Procedures Guide* and supplemental BLM National and Colorado State Office guidance were used by the review team to evaluate the items in the delegation of authority. In addition, the review team conducted interviews with involved personnel, referenced the Environmental Assessment, Prescribed Fire Plan, dispatch logs, weather observations, IQCS reports, photos and maps of the project and wildfire, and conducted a site visit on October 6, 2010.

The review team utilized escaped prescribed fire review checklists, interview questions, and followed a standard report format provided by the BLM National Office. The report consists of a general situation narrative, an evaluation of weather, fuels, and seasonal severity, and commendations/findings/recommendations.

Also included are several appendices:
A- Delegation of Authority to Escaped Prescribed Fire Review Team
B- Jack Springs II Prescribed Fire Plan
C- Craig Dispatch Wildcad Dispatch Logs
D- Maps and Photos

## Review Team Members

Jeff Arnberger, BLM NIFC (Fire Operations) - Review Team Lead
Krista Gollnick-Waid, BLM NIFC (Fuels Program Lead)
Sam Hescock, USFS (Payette National Forest East Zone Fire Management Officer)
Susan Cassel, BLM (Associate Field Manager, Kremling Field Office)

## General Situation Narrative


The Jack Springs II fuels treatment is located approximately 10 miles west of Greystone, Colorado, on private lands and lands administered by the Northwest Colorado Fire Management Unit (BLM Little Snake Field Office). The treatment target area consisted of 221 acres of young to moderate aged Pinyon and juniper trees and scattered Wyoming Big Sagebrush and native grasses within a larger planning area. The intent of the treatment was to

construct a fuel break to "fill in a gap" between prior fuels treatments and burn scars as part of a larger network of natural and planned fuel breaks to protect the community of Greystone, Colorado and surrounding ranches. 21 acres of Pinyon/juniper trees were mechanically thinned (masticated) along both sides of a road (approximately 100 feet wide on each side of the road) on the west flank of the treatment area in the weeks prior to ignition, and coupled with prior thinning efforts along a road on the east flank, provided firelines on both flanks. The goals and objectives stated in the prescribed fire plan were to improve ecosystem diversity, promote herbaceous species production, reduce fuels on 50-70% of the target area, and provide an effective fuel break between a road and an old burn.

The Prescribed Fire Plan was completed on August 23, 2010, and technical review by the Craig BLM Fire Management Specialist was completed on September 8, 2010. The Unit FMO reviewed and approved the plan on September 13, 2010. The Prescribed Fire Plan (including the Agency Administrator Pre-Ignition Approval Checklist) was signed by the agency administrator on September 15, 2010.

Implementation personnel and resources mobilized to the project site on the morning of September 28, 2010. The personnel provided weather observations to Craig Dispatch at 1030 hours that morning, and requested a spot weather forecast. At 1119 hours, Craig Dispatch broadcasted the day's general fire weather forecast to all personnel. At 1145 hours, Craig dispatch relayed the spot weather forecast to the Burn Boss. The spot weather forecast called for maximum temperatures 83-88%, minimum relative humidity 5-10%, northwest winds 3-8 mph with gusts to 15 mph, and a Haines Index of 5. All resources on the project were briefed by the Burn Boss and Burn Boss Trainee.

The Prescribed Fire Plan called for one Burn Boss (a Trainee was also assigned), one Firing Boss, one Holding Boss, 3-6 igniters, 3 engines, and miscellaneous equipment and supplies (torches, ATV's, etc.). The operational plan was to strengthen the firelines on the east and west flanks from south to north and tie in with previously constructed handline on the north flank. Fire would then be allowed to burn between the flanks to achieve the project objectives. If necessary, additional ignition within the target area would commence to ensure that 50-70% of the target area was treated with fire.

At 1205 hours, the Burn Boss reported to Craig Dispatch that the test fire will be initiated in the meadow area on the south end of the project area, and the Burn Boss was completing the GO/No Go checklist.

At 1236 hours, the Burn Boss reported to Craig Dispatch that the test fire went well, and that firing on the main project has begun, with ignition from south to north on both flanks had begun.

Personnel on scene were divided into two groups; a Firing Boss, ignition personnel, and holding personnel on the west flank, and a Firing Boss, ignition personnel, and holding personnel on the east flank. Ignition and holding actions by the two groups were progressing well, and moderate fire behavior was observed. The west flank Firing Boss indicated during interviews that operations on the west side had progressed farther to the north, ahead of the east side operations. The east flank Firing Boss indicated during interviews that he "fired a few rounds" into the area between the two flanks to generate fire activity to draw the two ignited

areas together at approximately the same time that the east side personnel reached an area of heavy sage and grass fuels immediately adjacent to the east flank control line.

The west side Firing Boss stated during interviews that in hindsight, the west side firing operation may have been too far ahead of the east side operations, creating the potential for fire ignited on the west side to run to the east at or slightly ahead of the east side firing operations.

During interviews, personnel on scene described a "wind shift", resulting in increased wind from the northwest that increased fire behavior and resulted in a hard push of fire against the east flank in the area of heavy sage and grass fuels.

At 1336, the Burn Boss reported to Craig Dispatch that there were a few spots on the east side of the burn (outside the target area across the fireline/road, but within the project area), and requested an additional engine. This engine responded from Brown's Park at 1353 hours, with a 45 minute ETA.

During interviews, personnel on scene stated that the fire activity increased dramatically on the eastern flank in the area of heavy fuels, and spotting occurred across the control line. Because one engine was committed to holding actions on the west flank, and another engine was north of the slopover/spots on the east flank, holding forces were not able to contain the slopover/spots before the slopover had grown to several acres in size. The slopover was still within the project area, but outside of the treatment area.

The fire on the east side of the east control line continued to grow, and move rapidly in an easterly direction, and slopped over County Road 56 and out of the project area within minutes. The fire moved to the east in Pinyon/juniper, sage, and grass fuels very similar to fuels located in the project area.

At 1400 hours, the Burn Boss reported to Craig Dispatch that they "had a good wind shift out of the west", and that the fire had slopped over county road 56 (the eastern boundary of the project area). The Burn Boss indicated that the slopover was approximately 15 acres, and that he was declaring the prescribed fire a wildfire. He also designated the Burn Boss Trainee as the Incident Commander, ordered an additional engine, and ordered two single engine air tankers.

In the next few minutes, Craig Dispatch made notifications to the agency administrator, the Colorado State Office, utility companies, and other involved parties.

At 1415 hours, the Incident Commander provided an update to Craig Dispatch, indicating that the slopover was approximately 60 acres. The incident Commander placed an order for two Type 1 Hotshot crews, 2 heavy air tankers, and one type 1 helicopter.
At 1442 hours, the Unit FMO updated the BLM Colorado State FMO, and at 1500 hours (in coordination with the Acting Field Manager) also updated the District Manager.

At approximately 1740 hours, the Incident Commander relayed to Craig Dispatch that fire activity had moderated, and that aerial resources would not be needed later that evening or for the next day. At 1812 hours, the Incident Commander provided another update, indicating that fire activity had moderated considerably; they had quite a bit of open line to address, and provided weather observations to Craig Dispatch.

At 2002 hours, the IC updated Craig Dispatch, stating that he would be releasing two engines later that night, and that the fire was looking good. At 2222 hours, all remaining resources on the fire were off the line and camped for the night.

On the morning of September 29, the IC updated Craig Dispatch, indicating that two handcrews, 3 engines, and miscellaneous overhead were working the line, isolated interior torching was occurring, the fire was looking good, and there were no anticipated needs for additional resources.

The Jack Springs II Wildfire was declared contained that evening at approximately 1900 hours, and was declared controlled on the evening of October 5, 2010, resulting in 222 acres burned. The Jack Springs II Wildfire required two Type 1 handcrews, 8 engines, two single engine air tankers, and two heavy air tankers to contain.

**Analysis of seasonal severity, weather events, and on site conditions leading up to the wildfire declaration**

To determine seasonal severity in the vicinity of the Jack Springs prescribed fire, several sources were consulted. For the northwest Colorado region, September was hotter and drier than normal. The U.S. Drought indicator (September 28th) showed the area to be abnormally dry. Additionally, the Energy Release Component (ERC) for the weather zone indicated the ERC was above the 80th percentile for late September. Live fuel moisture samples showed that sagebrush was fully cured (80% live fuel moisture) and juniper was extremely dry with 71% live fuel moisture.

According to the nearest Remote Automated Weather Station (RAWS), the area did experience a cool down with higher relative humidity (RH) 11-17% and 0.02 inches precipitation the week prior to ignition. Since September 25th, however, the area had experienced warming and drying, with maximum temperatures in the high 80's and RH <10% (recorded at Ladore RAWS station approximately 7 miles from the prescribed burn site).

On September 28th, 2010 the day the prescribed fire was ignited, a spot weather forecast was requested at 1030 hours and obtained at 1135 hours. The spot weather forecast called for maximum temperatures 83-88%, minimum relative humidity 5-10%, northwest winds 3-8 mph with gusts to 15 mph, and a Haines Index of 5.

At approximately 1230 hours, the test fire was ignited. At the time of ignition, the Ladore RAWS station recorded a temperature between 84-88 degrees and 7-9% RH, whereas conditions measured on-site indicated a temperature of 78 degrees and 15% RH. According to personnel on site, a wind shift was experienced (from the southeast to the northwest) at approximately 1pm. This wind shift, coupled with the low RH, high temperatures, and low live fuel moisture, led to the prescribed fire escape at approximately 1330 hours.

Additional factors contributing to the escape included more extreme fire behavior than predicted in the fuels on the southeast side of the project area. In the area of escape, flame lengths, rates of spread, and fire intensities were higher than anticipated in the juniper stands, with a heavy shrub understory component.

## Commendations

***Commendation 1***
The transition from prescribed fire to wildfire was seamless. The decision to declare a wildfire was made rapidly and the response by the organization was swift and appropriate.

***Commendation 2***
Personnel in the unit work well together as a team, and there is a positive and open work environment. The unit immediately began to learn from the escape, and is working to incorporate this lesson learned into future operations.

***Commendation 3***
Personnel from the local unit were very cooperative, honest, and forthcoming with information. This greatly assisted the review team.

## Findings Contributing to the Declaration of a Wildfire:

13 findings and 17 recommendations were formulated by the review team. These findings and recommendations relate to specific required elements of the escaped prescribed fire report, and also relate to the specific objectives given to the review team in the delegation of authority.

- If the prescribed Fire Plan was adequate.
    - Findings 1.1, 1.2, 5.1, 5.4 and Recommendations 1.1a, 1.1b, 1.1c, 1.1d, 1.1e, 1.2a, 5.1a, 5.4a
- If the prescription, actions, and procedures set forth in the plan were followed.
    - Findings 5.5, 5.6 and Recommendations 5.5a, 5.6a, 5.6b
- If overall policy, guidance, and procedures relating to prescribed fire operations are adequate and being followed.
    - Findings 3.1, 3.2, 3.3 and Recommendations 3.1a, 3.2a, 3.3a
- Whether or not prescribed fire training and experience of personnel involved were commensurate with required standards.
    - Findings 2.1 and no Recommendations
- Actions that should be implemented immediately to prevent similar future occurrences using the principles and cultures of high reliability organizing.
    - Findings 5.2, 5.3, 5.7 and Recommendations 5.2a, 5.3a, 5.7a

### 1. The Prescribed Fire Plan

***Finding 1.1***
The Jack Springs II Prescribed Fire Plan contains all required elements as outlined in the *Interagency Prescribed Fire Planning and Implementation Procedures Guide* and supplemental BLM national and Colorado State Office guidance. However, several of the key elements in the plan are inadequate and contributed to the escape.
***Discussion:***
-Element 3 (Complexity Analysis Summary): the complexity analysis in the plan does not adequately reflect the technical difficulty, risks, and consequences associated with the project from a site-specific perspective.
-Element 4 (Description of Prescribed Fire Area): this section does not accurately reflect the composition, variability, or fuel loading present at the site.

-Element 7 (Prescription): The Scott and Burgan fuel models used for the fire behavior prediction may not have been appropriate and may have underestimated actual and anticipated fire behavior for the project area and adjacent fuels, particularly in the Pinyon-Juniper. In this case, use of a shrub-dominated (i.e. SH5) might have better predicted the observed rates of spread.
-Element 15 (Ignition Plan): Ignition tactics are not clearly identified in the plan.
-Element 16 (Holding Plan): Holding tactics and specific actions/methods are not identified in the plan.

***Recommendations 1.1***

1.1a Ensure that the complexity analysis accurately depicts localized conditions, risks, and mitigation measures. Mitigation actions identified must be completed prior to implementation.
1.1b Ensure that vegetation, fuel loading, and fuel variability within the project area as well as adjacent areas are accurately described. Detailed vegetation/fuel maps verified through pre-burn surveys and/or photos should be included in the plan.
1.1c Ensure that fuel models used for fire behavior prediction are representative of actual fuels inside and outside the project area.
1.1d Ensure that specific ignition techniques, sequences, patterns, and ignition staffing are clearly described and implementable. Consider the use of a daily operational plan or Incident Action Plan.
1.1e Ensure that general procedures, critical holding points and actions, and minimum organization or capabilities are fully described and implementable. Consider the use of a daily operational plan or Incident Action Plan.

***Finding 1.2***

The environmental prescription as written in the burn plan does not meet policy as set forth in the *Interagency Prescribed Fire Planning and Implementation Procedures Guide*.

***Discussion:***

The prescribed fire plan contains language that states "environmental prescription values are guidelines for achieving desired fire behavior. Each individual parameter is not in itself limiting in a go/no go decision. All parameters must be considered together to determine if firing commences or continues. Desired fire behavior is the overriding prescriptive parameter."
The *Interagency Prescribed Fire Planning and Implementation Procedures Guide* clearly states that the environmental prescription consists of discrete values that set a range of acceptable conditions. It also states that if these discrete values will not allow fire behavior that will meet the project objectives, they may be modified. If modified, supporting documentation about why must be included.

***Recommendation 1.2***

1.2a Ensure environmental prescriptions contained in prescribed fire plans adhere to policy as set forth in the *Interagency Prescribed Fire Planning and Implementation Procedures Guide*.

## 2. Qualifications

***Finding 2.1***
All personnel involved with the Jack Springs II Prescribed Fire plan preparation and implementation met qualification requirements as set forth in the handbook and supplements.
Discussion: N/A
Recommendation N/A

## 3. Implementation

***Finding 3.1***
The prescribed fire was ignited when environmental conditions (specifically relative humidity, wind speed, and temperature) were forecasted to be outside of the prescription parameters.
***Discussion:***
The prescription as written in the prescribed fire plan for relative humidity, and temperature, and the forecasted values are as follows:

| **Prescription** | **Forecasted** |
|---|---|
| Relative Humidity: 15-35% | Relative Humidity: 5-10% |
| Wind: 0-12 mph, any direction | Wind: 3-8 mph, gusts to 15 mph |
| Temperature: 50-85 degrees | Temperature: 83-88 degrees. |

The prescribed fire plan contains language that states "environmental prescription values are guidelines, for achieving desired fire behavior. Each individual parameter is not in itself limiting in a go/no go decision. All parameters must be considered together to determine if firing commences or continues. Desired fire behavior is the overriding prescriptive parameter."
Weather observations on site at 1200 indicated 8% relative humidity. At 1330 hours during firing operations on the main project, the relative humidity was measured at 12%, just prior to the escape.
On scene personnel described a "wind shift" just prior to the escape. This "wind shift" was consistent with the forecasted winds relayed to the burn boss in the spot weather forecast.
***Recommendation 3.1***
3.1a. Adhere to the prescription as written in the prescribed fire plan. If forecasted or actual observed conditions are outside of the prescription, halt ignition until conditions are within the prescription. If the decision to modify the prescription in the field is made, it constitutes a change to the signed burn plan, and must be approved by the agency administrator.

***Finding 3.2***
The test fire was not conducted in an area representative of the project area.
***Discussion:***
The test fire was conducted in a meadow on the south end of the project area, near the ranch structures. This fuel type is not representative of the fuels in the project area.
***Recommendation 3.2***
3.2a Conduct test fires in areas with fuels and topography that represent the project area.

***Finding 3.3***
Holding and contingency resources were not adequate based on observed and predicted fire behavior at the prescription extremes.
***Discussion:***
Holding resources on scene would have been adequate to contain the initial slopover. However, one engine was committed to holding actions on the other side of the project area and was not close enough to attack the spot fire when it was small, and another engine was north of the slopover and could not initially attack the spot fire due to fire behavior. The closest contingency resource arrived 45 minutes after being ordered. Other contingency resources were not identified in the burn plan and took several hours to arrive.
***Recommendation 3.3***
3.3a Ensure adequate contingency resources are available commensurate with predicted and observed fire behavior as described in the *Interagency Prescribed Fire Planning and Implementation Procedures Guide*. Specifically identify off-site contingency resources and ensure they are available and close enough to be effective in the event of an escape.

**4. Post Burn (if applicable)**
Finding N/A
Discussion N/A
Recommendation N/A

**5. Other**

***Finding 5.1***
Goals and objectives in the prescribed fire plan are not measurable and don't contain a specific hazard reduction objective.
***Discussion:***
The goals and objectives stated in the prescribed fire plan are as follows:
-Improve ecosystem diversity
-Promote herbaceous species production
-Reduce fuels on 50-70% of the target area
-Provide an effective fuel break between a road and an old burn.
*The Interagency Prescribed Fire Planning and Implementation Procedures Guide* states that for prescribed fire plan objectives, the preparer should "describe in clear concise statements the specific and measurable resource and fire objectives for this prescribed fire. Objectives will be measurable and quantifiable so prescription elements can be developed to meet those objectives and the success of the project can be determined following implementation."
The objectives stated in the Jack Springs II Prescribed Fire Plan lack specificity and are difficult to measure, particularly with regard to the WUI objective stated in the Environmental Assessment. In addition, the objectives stated in the Environmental Assessment are non-specific, which directly affects the goals and objectives of the prescribed fire project.
***Recommendation 5.1***
5.1a Ensure that goals and objectives in Environmental Assessments and Prescribed Fire Plans are specific, measurable, and quantify the purpose and need for the project. For example, the Environmental Assessment and Prescribed Fire Plan for the Jack

Springs II project should contain maps depicting locations of adjacent WUI protection projects, values at risk, human development, fire disturbance, and potential fire behavior characteristics that will be mitigated by the project.

***Finding 5.2***

Technical review of the Jack Springs II Prescribed Fire Plan appears to be limited.

***Discussion:***

Technical review was completed as per policy requirements. However, the prescribed fire plan would have benefited by more thorough review, possibly by reviewers outside of the unit to ensure that a high quality document is produced.

***Recommendation 5.2***

5.2a Consider increased requirements for technical review of prescribed fire plans by reviewers from outside the unit. The Colorado State Office should consider revising the current requirement in Instruction Memorandum CO-IM-2010-029 to require increased technical review by reviewers outside of the local unit.

***Finding 5.3***

Several personnel interviewed expressed that, in hindsight, increased planning and preparation may have changed the outcome of the event.

***Discussion:***

Several personnel indicated that if there was one thing they would have done differently, it would have been to spend more time before implementation trying to identify weaknesses in the plan and correcting those potential weaknesses. Other personnel expressed that lessons learned on other prescribed fire projects may not have been incorporated into future projects.

***Recommendation 5.3***

5.3a Consider using After Action Reviews to produce lessons learned and incorporating those lessons learned into future projects. Consider using pre-mortems or similar exercises during prescribed fire plan preparation and prior to implementation to improve the quality of plans and implementation actions.

***Finding 5.4***

The Organization Chart in Element 11 (Organization and Equipment) in the Jack Springs II Prescribed Fire Plan does not adequately portray the number of personnel required to implement the prescribed burn, and does not clearly establish roles and responsibilities of implementation personnel.

***Discussion:***

The organization described in the plan lacks specificity, and does not contain "documentation in the form of an organization chart through all phases of implementation" as required by the *Interagency Prescribed Fire Planning and Implementation Procedures Guide*. The prescribed fire plan does not reflect the use of the second firing boss and second holding boss.

***Recommendation 5.4***

5.4a Ensure that an organization chart is contained in Element 11 of prescribed fire plans, and clearly describe roles and responsibilities of all implementation personnel.

***Finding 5.5***

Burn bosses were not aware of drought conditions and seasonal severity, which could have affected the Go/No Go checklist decisions.

***Discussion:***

When asked if the project area was experiencing drought or abnormal seasonal severity conditions, the Burn Boss and Burn Boss Trainee indicated that they were not aware of the drought conditions as indicated by the NOAA U.S. Drought Monitor and the RMCC Predictive Services website. Consideration of drought conditions and seasonal severity is a required element of the Go/No Go checklist.

***Recommendation 5.5***

5.5a Ensure that all implementation personnel are aware of weather factors such as drought, seasonal severity, etc. that are not identified in spot weather and general forecasts.

***Finding 5.6***

Documentation of required notifications (Element 9 Pre-Burn Considerations) is incomplete, and also requires numerous personnel to complete notifications.

***Discussion:***

The prescribed fire plan states that the Burn Boss has responsibility for 14 notifications (11 on the day of the burn), Craig Dispatch has responsibility for 4 notifications, the Unit FMO has one notification, and the Public Information Officer has shared responsibility for 10 of the Burn Boss notifications.

The notification chart in the prescribed fire plan contains no documentation that notifications were made. The Wildcad log contains documentation of Craig Dispatch's required notifications.

***Recommendation 5.6***

5.6a Consider consolidating responsibility for notifications with one or two individuals and limit the number of notifications required of the Burn Boss on the day of implementation.

5.6b Ensure documentation of notifications is completed and placed in the project file as per the *Interagency Prescribed Fire Planning and Implementation Procedures Guide*.

***Finding 5.7***

Interviews with involved personnel indicate that their comfort with the plan was based on prior successful implementation of similar projects with the same burn plan template in similar areas and under similar conditions.

***Discussion:***

Personnel interviewed made statements such as "this plan contains similar parameters to others in the same area"; "we've done this project before without any problems"; and "we've used this burn plan before for a lot of projects". These statements, coupled with the non-specific nature of the prescribed fire plan create a tendency for complacency or simplification.

The principles of HRO establish that mindful organizations are wary of past successes. A feeling that you "think you've seen it all before" is an indicator that you are operating by routine rather than by fresh updates based on what is actually occurring. Mindful organizations are also wary of oversimplification. For example, it appears that the complexity analysis contained in the prescribed fire plan has complexity ratings not reflective of actual conditions. These complexity ratings might be artificial because

they were rated at that level on prior projects. Mindful organizations tend to question the routine, and place little faith in the fact that "it's worked fine in the past."

***Recommendation 5.7***

5.7a The Wildland Fire Lessons Learned Center has produced an excellent document entitled "*Prescribed Fire Escapes and Near Miss Lessons Learned: Using the High Reliability Organizing Concept of Mindfulness to Better Anticipate and Contain Unexpected Events on Prescribed Fires*". This document consolidates information from escaped prescribed fire reviews and interviews with numerous personnel involved in escaped prescribed fires, and makes recommendations for applying mindfulness and HRO principles to prescribed fire planning and implementation. Prescribed fire plan preparers and implementation personnel should read this document and apply the concepts it contains to better anticipate future unexpected events and unwanted outcomes.

## Summary

The Jack Springs II Escaped Prescribed Fire resulted in no extraordinary resource damage, no structures or improvements were damaged, and no injuries occurred. The local unit responded swiftly and appropriately to the escape, and quickly convened a review team. The commendations, findings, and recommendations contained in this report should be used to prevent similar occurrences in the future.

The review team would like to thank the Little Snake Field Office, the Northwest Colorado District, the Colorado State Office, and the Jack Springs II planning/implementation personnel for their candor, honesty, cooperation, and support.

Appendices:
A- Delegation of Authority to Escaped Prescribed Fire Review Team
B- Jack Springs II Prescribed Fire Plan
C- Craig Dispatch Wildcad Dispatch Logs
D- Maps and Photos

# Appendix A
# Delegation of Authority

United States Department of the Interior
BUREAU OF LAND MANAGEMENT
Northwest Colorado District
2815 H Road
Grand Junction, Colorado 81506

In Reply Refer to:
9214 (LLCON00000)

Memorandum

TO: Jeff Arnberger, Team Leader, Jack Springs Escaped Prescribed Fire Review Team

FROM: Jamie E.Connell, Northwest Colorado District Manager

SUBJECT: Jack Springs Escaped Prescribed Fire Review

This memorandum constitutes my delegation of authority for the following designated Escaped Prescribed Fire Review Team (Jeff Arnberger, Krista Gollnick-Waid, Sam Hescock and Susan Cassel as Line Officer Representative) to conduct an in-depth review of the Jack Springs Prescribed Fire in northwest Colorado. The review team shall follow the procedures outlined in Chapter 18 of the Interagency Standards for Fire and Aviation Operations for 2010 as well as the Interagency Prescribed Fire Planning and Implementation Guide (July 2008) and the Bureau of Land Management's (BLM) Supplement to the RX Fire Guide (2010).

The purpose of the review is to evaluate the circumstances associated with the planning and execution of the Jack Springs Prescribed Fire within the Little Snake Field Office and determine whether or not policy, guidance and procedures were followed. The Review Team will examine events and circumstances during the time period beginning with planning and implementation of the prescribed fire to the declaration of the wildfire being contained.

The Review Team shall analyze the factual information to determine:

- If the prescribed fire plan was adequate.
- If the prescription, actions, and procedures set forth in the plan were followed.
- If overall policy, guidance, and procedures relating to prescribed fire operations are adequate and being followed.
- Whether or not prescribed fire training and experience of personnel involved were commensurate with required standards.
- Actions that should be implemented immediately to prevent similar future occurrences using the principles and cultures of high reliability organizing.

Northwest Interagency Fire Management Unit personnel and Little Snake Field Office personnel will provide assistance to the Review Team in gathering information vital to the review process.

The Review Team will complete work by the close of business on October 7, 2010. The Review Team will conduct a closeout in Craig, Colorado with the Northwest Colorado District Manager or their designee on October 7, 2010. A final report will be submitted to Northwest Colorado District Manager within two weeks of this closeout.

This Delegation shall go into effect at 8:00 a.m. on October 5, 2010.

_____ _____

Jamie E. Connell, Northwest Colorado District Manager Date

# Appendix B
# Jack Springs II Prescribed Fire Plan

# PRESCRIBED FIRE PLAN

**ADMINISTRATIVE UNIT(S):** CO-CRD-LSFO

**PRESCRIBED FIRE NAME:** Jack Springs II

**PREPARED BY:** Ron Simpson RXB2 **DATE:** 8/23/10

Name & Qualification

**TECHNICAL REVIEW BY:** Dale Beckerman **DATE:** 9/8/10

Name & Qualification

**REVIEWED BY:** _____ **DATE:** 9/13/2010

Unit FMO

**COMPLEXITY RATING:** MODERATE

**APPROVED BY:** _____ **DATE:** 9/15/2010

Agency Administrator

**Project Name: Jack Springs II RX**

**Unit Name: Jack Springs II**

## ELEMENT 2: AGENCY ADMINISTRATOR PRE-IGNITION APPROVAL CHECKLIST

Instructions: The Agency Administrator's Pre-Ignition Approval is the intermediate planning review process (i.e. between the Prescribed Fire Complexity Rating System Guide and Go/No-Go Checklist) that should be completed before a prescribed fire can be implemented. The Agency Administrator's Pre-Ignition Approval evaluates whether compliance requirements, Prescribed Fire Plan elements, and internal and external notifications have been or will be completed and expresses the Agency Administrator's intent to implement the Prescribed Fire Plan. If ignition of the prescribed fire is not initiated prior to expiration date determined by the Agency Administrator, a new approval will be required.

| YES | NO | KEY ELEMENT QUESTIONS |
|---|---|---|
| X | | Is the Prescribed Fire Plan up to date?<br>*Hints: amendments, seasonality.* |
| X | | Will all compliance requirements be completed?<br>*Hints: cultural, threatened and endangered species, smoke management, NEPA.* |
| X | | Is risk management in place and the residual risk acceptable?<br>*Hints: Prescribed Fire Complexity Rating Guide completed with rational and mitigation measures identified and documented?* |
| X | | Will all elements of the Prescribed Fire Plan be met?<br>*Hints: Preparation work, mitigation, weather, organization, prescription, contingency resources* |
| X | | Will all internal and external notifications and media releases be completed?<br>*Hints: Preparedness level restrictions* |
| X | | Will key agency staff be fully briefed and understand prescribed fire implementation? |
| | X | Are there any other extenuating circumstances that would preclude the successful implementation of the plan? |
| X | | Have you determined if and when you are to be notified that contingency actions are being taken? Will this be communicated to the Burn Boss? |
| | | Other: |

Recommended by: Dale Beckerman Date: 9/13/10
FMO/Prescribed Fire Burn Boss

Approved by: David C B Jackson Date: 9/15/2010
Agency Administrator

Approval expires (date): Oct 15, 2010

**Project Name:** Jack Springs II RX

**Unit Name:** Jack Springs II

## ELEMENT 2: PRESCRIBED FIRE GO/NO-GO CHECKLIST

| | YES | NO |
|---|---|---|
| **A.** Has the burn unit experienced unusual drought conditions or contain above normal fuel loadings which were not considered in the prescription development? If NO proceed with checklist., if YES go to item B. | | ✓ |
| **B.** If YES have appropriate changes been made to the Ignition and Holding plan and the Mop Up and Patrol Plans? If YES proceed with checklist below, if NO STOP. | | |

| YES | NO | QUESTIONS |
|---|---|---|
| ✓ | | Are ALL fire prescription elements met? |
| ✓ | | Are ALL smoke management specifications met? |
| ✓ | | Has ALL required current and projected fire weather forecast been obtained and are they favorable? |
| ✓ | | Are ALL planned operations personnel and equipment on-site, available, and operational? |
| ✓ | | Has the availability of ALL contingency resources been checked, and are they available? |
| ✓ | | Have ALL personnel been briefed on the project objectives, their assignment, safety hazards, escape routes, and safety zones? |
| ✓ | | Have all the pre-burn considerations identified in the Prescribed Fire Plan been completed or addressed? |
| ✓ | | Have ALL the required notifications been made? |
| ✓ | | Are ALL permits and clearances obtained? |
| ✓ | | In your opinion, can the burn be carried out according to the Prescribed Fire Plan and will it meet the planned objective? |

**If all the questions were answered "YES" proceed with a test fire. Document the current conditions, location, and results**

R. L.
Burn Boss

9/28/10
Date

B. D. (T)

9/28/10

**Project Name: Jack Springs II RX**

**Unit Name: Jack Springs II**

## ELEMENT 3 COMPLEXITY ANALYSIS SUMMARY

| PRESCRIBED FIRE NAME | | | |
|---|---|---|---|
| **ELEMENT** | **RISK** | **POTENTIAL CONSEQUENCE** | **TECHNICAL DIFFICULTY** |
| 1. Potential for escape | MODERATE | MODERATE | MODERATE |
| 2. The number and dependence of activities | MODERATE | MODERATE | MODERATE |
| 3. Off-site Values | MODERATE | MODERATE | LOW |
| 4 On-Site Values | MODERATE | MODERATE | MODERATE |
| 5. Fire Behavior | MODERATE | MODERATE | MODERATE |
| 6. Management organization | MODERATE | MODERATE | LOW |
| 7. Public and political interest | MODERATE | MODERATE | MODERATE |
| 8. Fire Treatment objectives | MODERATE | MODERATE | MODERATE |
| 9 Constraints | MODERATE | MODERATE | MODERATE |
| 10 Safety | LOW | LOW | LOW |
| 11. Ignition procedures/ methods | MODERATE | MODERATE | MODERATE |
| 12. Interagency coordination | LOW | LOW | LOW |
| 13. Project logistics | LOW | LOW | LOW |
| 14 Smoke management | LOW | LOW | LOW |

| COMPLEXITY RATING SUMMARY | |
|---|---|
| | **OVERALL RATING** |
| **RISK** | MODERATE |
| **CONSEQUENCES** | MODERATE |
| **TECHNICAL DIFFICULTY** | MODERATE |
| **SUMMARY COMPLEXITY DETERMINATION** | MODERATE |

**RATIONALE:** This project rates as an overall moderate complexity burn. The main reasons for rating moderate include: the broadcast nature of the burn, proximity to adjacent and isolated residences, and burn objectives.

## ELEMENT 4: DESCRIPTION OF PRESCRIBED FIRE AREA

### A. Physical Description

1. Location: The project is located in Moffat County on North Side of Douglas Mt., end on County Road 56, approximately 10 miles west of Greystone.

   T8N R102W sections 10, 11, 14 and 15.

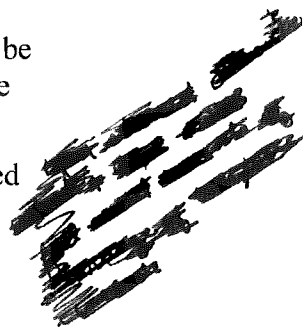
2. Size: 221 acres

3. Topography: The target area is relatively flat, with a drainage that runs through the upper middle of the unit. The slope is gradual from the south end of the unit to the north. There is a steeper 30% slope drop in the topography on the North East corner of the unit and in the upper portion of the drainage.

4. Project Boundary: The target and project boundaries are depicted on the attached map (Appendix A).

### B. Vegetation/Fuels Description:

1. On-site fuels data: The target area involves 221 acres of young to moderate aged pinyon and juniper trees as well as Wyoming big sagebrush that is scattered throughout the unit. Of this area, roughly 21 acres of pinyon and juniper trees will be mechanically thinned along an existing two-track road providing a fuel break on the west flank.



2. FBPS (fire behavior prediction system) fuel model GS2 for sagebrush dominated areas and fuel model TL3 for pinyon/juniper areas.

3. Adjacent fuels data: Adjacent fuels on all sides are similar to that described for the target area.

**C. Description of Unique Features:** There are three part-time residences and associated outbuildings located on the South flank of the unit. There is also a power line that runs along county road 56 that goes to the residences. Fuels have been mechanically treated along this corridor. There are also fence lines within the unit that will need protection while burning or rebuilding after the burn.

## ELEMENT 5: GOALS AND OBJECTIVES

**A. Goals:** The goal for this prescribed burn is to reduce hazardous fuels in the form of thick pinyon\juniper, sagebrush, dead/down material, and litter accumulation. This will reduce the chance of intense wildfires that could threaten residences on the north side of Douglas Mt. and the Greystone area.

**B. Objectives:**

1. Resource objectives:
   a) Improve ecosystem diversity by providing a mosaic of vegetation age classes and seral stages.

   b) Promote herbaceous species production in sagebrush and pinyon/juniper dominated areas.

2. Prescribed fire objectives:
   a) Reduce fuels on 50% - 70% of the target area.

   b) Provide an effective fuel break from County Rd. 56 north to an old burn by Jack Springs.

## ELEMENT 6: FUNDING:

**A. Cost:** Approximately $30,000

**B. Funding source:** LLCON01000-LF31010WU.JW0000-LFHFEQ390000

## ELEMENT 7: PRESCRIPTION

**A. Environmental Prescription*:**

| | |
|---|---|
| **Temperature –** | 50° - 85° |
| **Relative Humidity –** | 15% - 35% |
| **Windspeed (midflame) –** | 0 - 12 mph |
| **Wind Direction –** | Any |
| **Fine Dead Fuel Moisture –** | 3% - 8% |
| **1000 Hour Fuel Moisture -** | 8% - 20% |
| **Sagebrush Live Fuel Moisture –** | 70% - 140% |

*Environmental prescription values are guidelines for achieving desired fire behavior. Each individual parameter is not in itself limiting in a go-no go decision. All parameters must be considered together to determine if firing commences or continues. Desired fire behavior is the over riding prescriptive parameter.

**B. Sagebrush Fire Behavior Prescription:**
**Flame Length -** 3' – 12'
**Rate of Spread -** 10 – 115 ch/hr

**Pinyon/Juniper Fire Behavior Prescription:**
**Crown Fire -** Passive and conditional crown fire is acceptable but active crown fire is not.
**Rate of Spread -** 1 – 45 ch/hr
**Probability of Ignition** <85%

Fire behavior values are an average for a free burning head fire. Flanking, backing, torching, or when strips of fire converge will display fire behavior characteristics that may be less than or exceed the above values.

Fire behavior outputs where produced from BEHAVE 3.02 using fuel model GS2 for sagebrush dominated areas and fuel model TL3 for pinyon/juniper areas. Flame lengths of over 3ft. are typically required in order to get significant sagebrush mortality and consumption. Fuel model TL3 with a canopy base height of 3' seemed to best represent under what condition pinyon/juniper will start torching and crowning. The crown fire rate of spread was used in the prescription development. Flame length is not an output in behave for crown fire modeling, but past experience has shown that conditional crown fire is acceptable but active crown fire is undesirable due to control problems.

## ELEMENT 8: SCHEDULING

**A. Ignition Time Frames/Season(s):** Spring or Fall.

**B. Projected Duration:** One to three days for ignition and holding.

**C. Constraints**: There are the constraints of no burning from May 15 to June 30 due to migratory birds in the spring.

## ELEMENT 9: PRE-BURN CONSIDERATIONS

**A. Considerations:**

1. On Site: Pinyon/Juniper and sagebrush live fuel moisture will be monitored to aid in determining favorable burning conditions. All mechanical thinning will be completed before ignition. Hand line on the North Perimeter will be constructed prior to RX burn ignition.

2. Off Site: None

**B. Method and Frequency for Obtaining Weather and Smoke Management Forecast(s):** Weather prior to burning will be monitored using the Ladore RAWS. Spot weather forecasts will be obtained from the Grand Junction NWS using on site observations on any day burning will occur.

## C. Notifications:

| NOTIFICATIONS: | | | | | |
|---|---|---|---|---|---|
| **Who** | **When*** | **Phone Number and/or e-mail** | **Responsibility** | **Date** | **Method** |
| State FMO | Burn Day | 303-239-3689<br>303-239-3804 | Unit FMO | | |
| RMACC | Burn Day | 303-445-4300 | Dispatch | | |
| Field Office Manager | 1 day prior to Burning | 970-826-5089 | Burn Boss or Zone FMO | | |
| Co. State Patrol/Moffat County Sheriff | Burn Day | 970-824-6501 | Dispatch | | |
| Fred Blevins (permittee) | 1 day prior to Burning | 970-269-7215 or<br>970-365-3658 (Browns Park Store) | Burn Boss or Zone FMO | | |
| Colo. State Air Pollution Control Division | Burn day by 10 AM | 303-692-3224<br>Colleen.campbell@state.co.us | Burn Boss | | |
| Browns Park NWR | Burn Day | 970-365-3613 | Dispatch | | |
| Zenobia and Roundtop Lookouts (if staffed) | Burn Day | Contact by radio | Dispatch | | |
| Leigh Erceg (land owner within project) | 1 week prior | 209-605-3701<br>970-826-9769 | Burn Boss | | |
| John and Lois Vaughn (Greystone homeowner) | Burn Day | 970-269-8950 | PIO or Burn Boss | | |
| Tom and Mary Burton (Greystone homeowner) | Burn Day | 970-879-5602<br>970-734-8094 cell | PIO or Burn Boss | | |
| Gary and Susan Loman (Greystone homeowner) | Burn Day | 970-879-4063 | PIO or Burn Boss | | |
| Bob and Mara Malloy (Greystone homeowner) | Burn Day | 970-269-3000 | PIO or Burn Boss | | |
| Bob and Mari Tobin (Greystone homeowner) | Burn Day | 970-878-4205 | PIO or Burn Boss | | |
| Dean and Kathy Jo Carey (Greystone homeowner) | Burn Day | 970-269-3200 | PIO or Burn Boss | | |
| Glade Ross (Greystone homeowner) | Burn Day | 970-675-8105 | PIO or Burn Boss | | |
| Bill Miller (Greystone homeowner) | Burn Day | 970-276-3357 | PIO or Burn Boss | | |
| Roy Marceca (Greystone homeowner) | Burn Day | 720-323-8838 | PIO or Burn Boss | | |
| Scott and Debbie Estey (area resident) | Burn Day | 970-269-3030 | PIO or Burn Boss | | |

## ELEMENT 10: BRIEFING

**Briefing Checklist:**

- ☑ Burn Organization
- ☑ Burn Objectives
- ☑ Description of Burn Area
- ☑ Expected Weather & Fire Behavior
- ☑ Communications
- ☑ Ignition plan
- ☑ Holding Plan
- ☑ Contingency Plan
- ☑ Wildfire Conversion 9/22/10
- ☑ Safety

9/25/10 RXB2(J)

## ELEMENT 11: ORGANIZATION AND EQUIPMENT

**A. Operation:**

| | | |
|---|---|---|
| RXB2 | 1 | |
| FIRB | 1 | |
| HLDB | 1 | |
| Lighters | 3-6 | |
| Engines | 3 | type 4 or type 6 |
| ATV | 2 | |

Engine crew members may serve as lighters if not needed for holding.

**B. Supplies:**

Drip torches - At least 4-6
Drip torch fuel - 50 gallons for each day of burning.

## ELEMENT 12: COMMUNICATION

| COMMUNICATIONS | PROJECT NAME: | Jack Springs II |
|---|---|---|
| | BURN UNIT NAME: | Jack Springs II |

Identify and assign command, tactical and air operations frequencies as needed.

| SYSTEM | RX FREQ. | RX TONE | TX FREQ. | TX TONE | ASSIGNMENT | REMARKS |
|---|---|---|---|---|---|---|
| Zenobia | 171.1625 | | 166.3625 | 110.9 | Command | Primary |
| Lookout | 168.425 | | 169.625 | 151.4 | Command | Secondary |
| Fire Tac | 169.2875 | | 169.2875 | | tactical | |
| Air/Ground | 171.550 | | 171.550 | | Air/Ground | If Needed |

**PROJECT PHONE NUMBERS**

| PERSONNEL NAME: | PHONE NUMBER: |
|---|---|
| Craig Dispatch | 970-826-5037 |
| Grand Junction National Weather Service | 970-256-9463 |
| | |

## ELEMENT 13: PUBLIC AND PERSONNEL SAFETY, MEDICAL

A. **Safety Hazards:** All normal hazards for personnel associated with prescribed burning are identified in the attached Risk Management Analysis (Appendix C). There is no public road access to the project; therefore, there should be no risk to the general public.

B. **Measures Taken to Reduce the Hazards**: Appendix C – Risk Management Analysis describes the measures taken to reduce hazards. Burning will be coordinated with the participating landowner to insure no one is home or other arrangements made to eliminate risk to the family.

## C. Emergency Medical Procedures:

| EMERGENCY MEDICAL PLAN | PROJECT NAME: | Jack Springs II |
|---|---|---|
| | BURN UNIT NAME: | Jack Springs II |

**EMERGENCY FACILITIES:**

| NAME OF CARE FACILITY | PHYSICAL ADDRESS | TRAVEL TIME (MINUTES) AIR / GND. | PHONE NUMBER | BURN CENTER (Check Y or No) | HELIPAD (Check Y or N) |
|---|---|---|---|---|---|
| Memorial Hospital | 750 Hospital Loop Craig, CO | 30 90 | 970-824-9411 | NO | Y |
| St. Mary's Hospital | 2635 N. 7th, Grand Jct. | 75 4.5 hr | 970-244-2273 | Y | Y |

**AIR AND GROUND PATIENT TRANSPORTATION**

| NAME OF TRANSPORT AGENT | PHYSICAL ADDRESS | PHONE NUMBER | PARAMEDICS (Check Y or N) |
|---|---|---|---|
| Maybell Ambulance | Maybell, CO | 911 | N |
| Memorial Hospital | 785 Russell, Craig, CO | 911 | N |
| St. Mary's Care Flight | 1100 Paterson Rd, Grand Jct. | 1-800-332-4923 | Y |

**MEDICAL EMERGENCY PROCEDURES:**

All major medical incidents will be reported to Craig Dispatch. Provide dispatch with the type(s) of injury, # of persons injured, type of transportation requested (air or ground), and basic vital signs. Utilize on-site EMTs and/or first aid treatment to stabilize and comfort the patient(s). The best medivac helispot is located at the Split Rock Ranch field on the south side of the unit, latitude 40° 38' 29.14" and longitude 108° 50' 13.23", however there are numerous flat openings in and around the project that could be utilized. Any helispot will be a minimum of 100' X 100' in size and dispatch advised of obvious flight hazards (e.g. power lines). Air to Ground frequency of 171.550 will be utilized. For minor injuries, transport the injured to the nearest medical facilities via project vehicles. Contact dispatch for logistical support. Relay to dispatch "Non-emergency" if appropriate. Note: Other helicopters may land at hospital helipads; however these hospital helipads often need a minimum of 10 minutes notice to clear the pad.

**DIRECTIONS FROM NEAREST MEDICAL FACILITY TO PROJECT VIA GROUND:**

From Craig: Take US 40 west 30 miles to Maybell, turn north on State Highway 318, proceed 30 miles to county road 12, turn left and go 5.4 miles to county road 10 road, turn left (south) and go 1.6 miles to county road 56, turn right and go 9.6 miles to project site.

## ELEMENT 14: TEST FIRE

| TEST FIRE | PROJECT NAME: | Jack Spring II |
|---|---|---|
| | BURN UNIT NAME: | Jack Spring II |

**PLANNED LOCATION & SPECIFIC INSTRUCTIONS:**

Test fire will be located at a location that has barriers on at least 2 sides and is easily controllable. Exact location may vary depending on wind direction. One or two drip torches will be used to start a small strip head fire.

**BURN DAY DOCUMENTATION**

| WEATHER CONDITIONS ONSITE: | RESULTS OF TEST FIRE: |
|---|---|
| 1010 64° F 22% RH CALM<br>1200 79° F 8% RH 1MPH EAST (KESTREL)<br>(1230 78° F 15% RH 1 MPH EAST) | GOOD CONSUMPTION<br>NO CONTROL PROBLEMS |

| Does the test fire meet prescription parameters? | YES | ✓ | NO | | |
|---|---|---|---|---|---|

**COMMENTS:**

## ELEMENT 15: IGNITION PLAN

A. **Firing Methods:** Ground Application

B. **Devices:** Drip Torches

C. **Techniques:** Strip Head and/or Flank Firing. Backing fire may need to be utilized in areas that have ladder fuels in order to minimize torching along the fire line.

D. **Sequences:** Ignition will generally proceed into the wind with sufficient black line width established before strips are ignited perpendicular to the wind. Black lining may be conducted separate from unit firing in low to moderate conditions.

E. **Patterns:** No special patterns needed.

F. **Ignition Staffing:** One firing boss and three to six lighters with drip torches are needed (see Element 11: Organization and Equipment).

## ELEMENT 16: HOLDING PLAN

A. **General Procedures for Holding:** Engines will be utilized to patrol behind lighters along the burn perimeter. In areas that are not engine accessible, firefighters with hand tools will patrol the line. A minimum of one engine will patrol the unit the day after ignition is complete, mopping up any threatening hot spots within 50' of the perimeter. Daily patrols will continue if deemed necessary by the burn boss based on how quickly fuels burn out and current and predicted weather. Prior to burning or black lining, the Greystone water tank will be filled or a 1500+ gallon portable tank will be set-up in the project area.

B. **Critical Holding Points and Actions:** Holding around the Erceg residences in unit one is most critical. If a spot fire occurs within the compound, all ignitions will cease and priority focused on spot fire control.

C. **Minimum Organization or Capabilities Needed:** One holding boss and three engines (type 4 or type 6). If black lining only, one RXB2 and two engines are required. The RXB2 may be one of the engine captains. (see Element 11: Organization and Equipment).

## ELEMENT 17: CONTINGENCY PLAN

| CONTINGENCY PLAN FOR HOLDING | PROJECT NAME: | Jack Springs II |
|---|---|---|
| | BURN UNIT NAME: | Jack Springs II |

**TRIGGER POINTS:**

Determine trigger points that indicate when additional holding resources and actions are needed to ensure the prescribed fire stays within prescription.

| | Trigger Point | Action Needed |
|---|---|---|
| **Trigger Point 1** | Fire behavior or Fire Effects not being achieved | Adjust ignition patterns or spacing. Delay burn until conditions are favorable |
| **Trigger Point 2** | Spots/slop-over greater in number or ROS than holding forces can control or a spot fire within the Erceg/Split Rock Ranch compound. | Stop ignition and utilize all personnel for control and holding operations. |
| **Trigger Point 3** | Fire spread threatening or exceeding allowable boundary. | Order additional resources through Craig Dispatch in order to control unwanted spread by the end of the next burning period. |
| **Trigger Point 4** | Fire spread outside of allowable boundary and not likely to be controlled by the end of the next burning period. | Declare the prescribed burn a wildfire and refer to 'Wildfire Conversion' below. |

**MINIMUM RESOURCES AND MAXIMUM RESPONSE TIMES**

On site resources are identified in the Organization Section above. One additional type 4 or type 6 engine with a response time of three hours must be available during the burn period.

## ELEMENT 18: WILDFIRE CONVERSION

A. **Wildfire Declared By:** Burn Boss in consultation with zone or unit FMO.

B. **IC Assignment:** Burn Boss will become IC until relieved or replaced. During mop-up phase a different ICT4 may be assigned.

C. **Notifications:** Burn Boss will notify Craig Dispatch of escape declaration. Unit FMO will notify the Field Office Manager. Dispatch or Unit FMO will notify affected private land owners (if any). Dispatch will notify the Moffat County Sheriff's Office if private lands are involved.

D. **Extended Attack Actions and Opportunities to Aid in Fire Suppression:** If the fire cannot be contained by the end of the burn period the day following escape, the Unit or Zone FMO in consultation with the IC and Field Office Manager will develop a WFDSS to guide extended attack operations. There are roads and natural barriers in the area that can aid in suppression.

## ELEMENT 19: SMOKE MANAGEMENT AND AIR QUALITY

A. **Compliance:** All federal state and local air quality regulations must be adhered to. This is done by complying with all smoke permit conditions specified in the Broadcast Prescribed Fire Permit issued by the Colorado Air Pollution Control Division for this project.

B. **Permits to be Obtained:** Colorado Broadcast Prescribed Fire Permit.

C. **Smoke Sensitive Areas/Receptors:** There is one residence, and out buildings, on the south flank of the project, one residence 3 miles to the east, and Greystone 10 miles to the east. The residence within the unit one is not considered a smoke receptor because the owners are supportive of this project. County road 56 runs to the project, but has very low use except during rifle hunting season.

D. **Impacted Areas:** A north or northeast wind could impact the residences to the south, and west wind could impact Greystone. Despite the proximity of residences, smoke density is expected to be below National Ambient Air Quality Thresholds.

E. **Mitigation Strategies and Techniques to Reduce Smoke Impacts:** Burning will occur only if smoke dispersal is fair or better. A maximum of 221 acres per day would be burned. If unacceptable impacts to area residences begin to occur, ignition will be stopped and fire spread checked if feasible. There are many natural barriers within the unit that will naturally limit further fire spread. One "Prescribed Burn Ahead" sign will be posted at the intersection of county roads 10 and 56 and one at County road 56 and 138.

## ELEMENT 20: MONITORING

A. **Fuels Information (forecast and observed) Required and Procedures:** Sagebrush and 1000 hr fuels will be sampled within one week of burning to insure fuel moisture it is within prescription.

B. **Weather Monitoring Required and Procedures:** Weather observations will be recorded every hour during burning operations using a belt weather kit.

C. **Fire Behavior Monitoring Required and Procedures:** Observations of flame length and rate of spread will be recorded periodically during active burning.

D. **Monitoring Required To Ensure That Prescribed Fire Plan Objectives Are Met:** The burn boss will monitor the area actually burned as firing progresses to ensure that 50% to 70 % of the area within the perimeter is burned.

E. **Smoke Dispersal Monitoring Required and Procedures:** Burning will only occur in fair or better smoke dispersal conditions as forecasted by the National weather Service. The Greystone area will be periodically checked for smoke density. No other smoke dispersal monitoring is required.

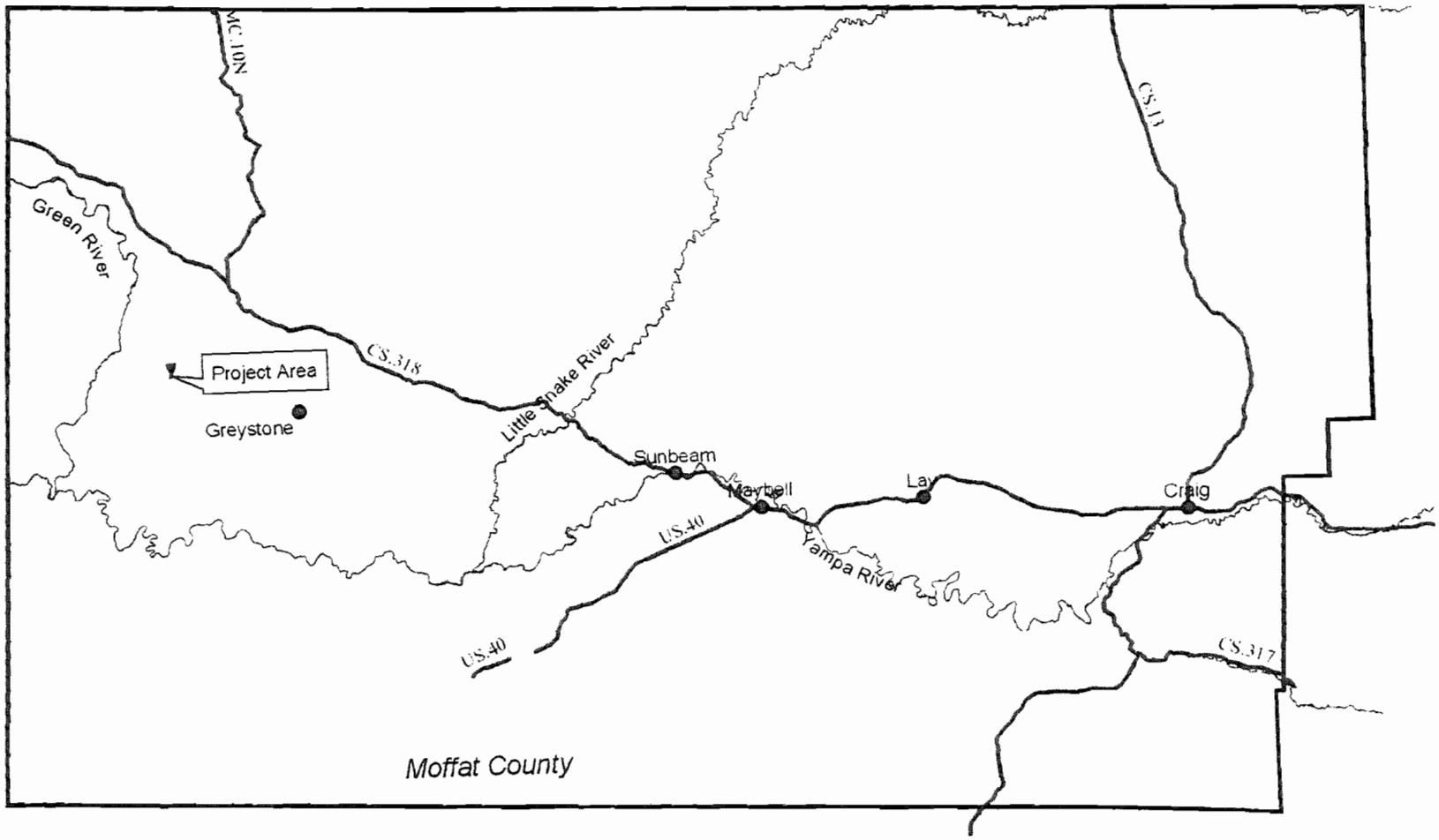
## ELEMENT 21: POST-BURN ACTIVITIES

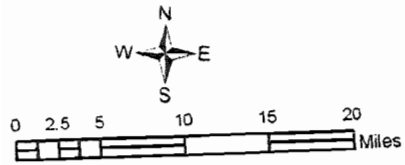
**Post-burn Activities to be completed:** After burning is complete, the actual burned area will be mapped and the percent area burned calculated. The map will be filed with the project file and a copy given to the resources staff. The attached Burn Boss Report (Appendix E) will be completed and kept with the project file.

## APPENDICES:

A. **Maps: Vicinity and Project**
B. **Complexity Analysis**
C. **Risk Management Analysis**
D. **Fire Behavior Modeling Documentation**
E. **Burn Boss Report**
F. **Technical Review Checklist**

## A1. Vicinity Map

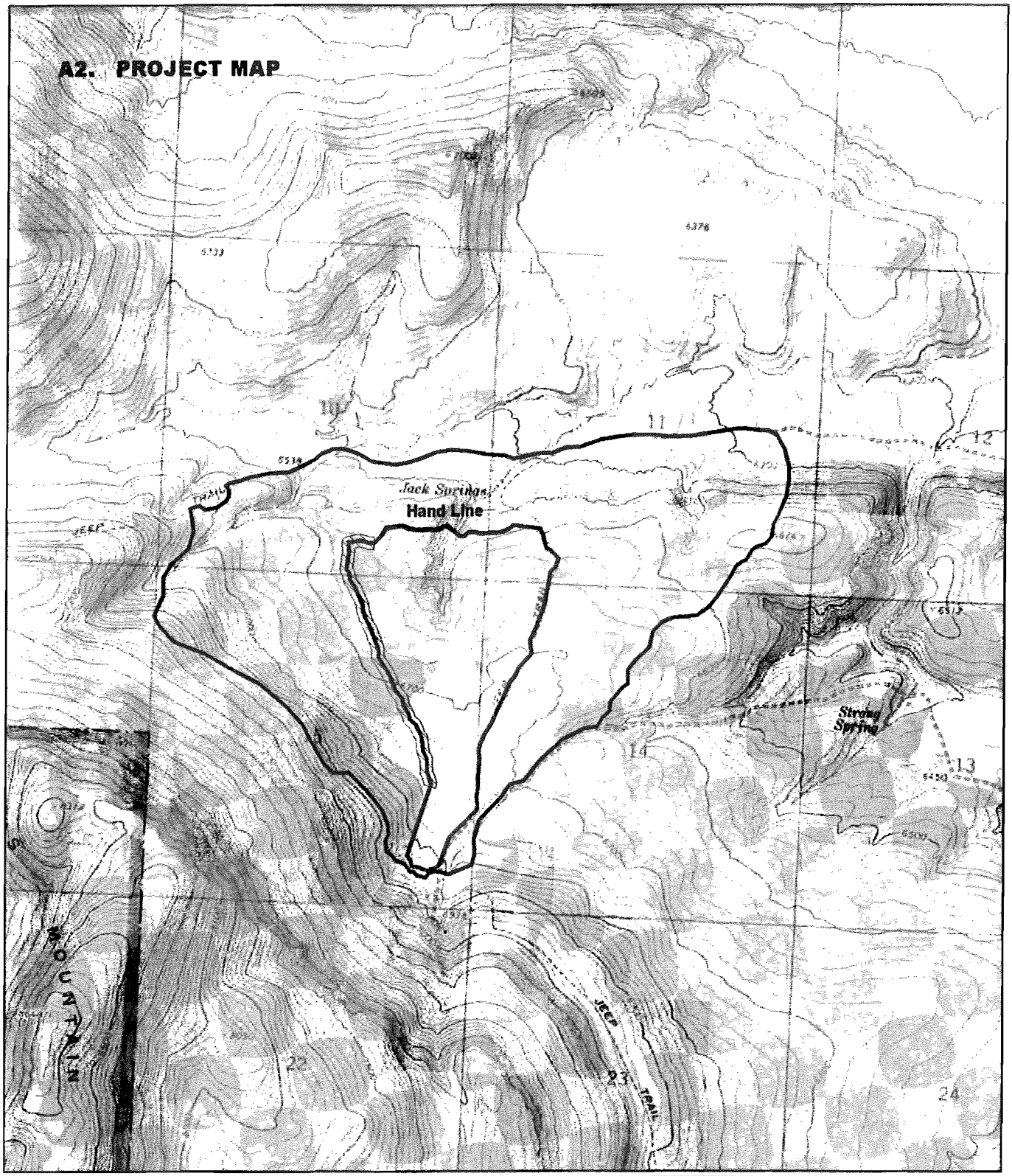



**Jack Springs II Prescribed Burn**
**Vicinity Map**

JackSpringsII_rx

## A2. PROJECT MAP



## B: COMPLEXITY ANALYSIS

# Prescribed Fire Complexity Rating System Guide Worksheet

Instructions: This worksheet is designed to used with the Prescribed Fire Complexity Rating descriptors on Page 6.

Project Name: Jack Springs II Number: _____

Complexity elements:

**1. Potential for Escape**

| **Risk** | **Rationale** |
|---|---|
| **Preliminary Rating:** *Low Moderate* ***High*** | There is some risk of escape if high winds and spotting occur. |
| **Final Rating:** *Low* ***Moderate*** *High* | Burning will be conducted in the fall with cooler temperatures and good RH recovery. There is good fire line preparation on all flanks to help in fire control within the boundaries. |
| **Potential Consequences** | **Rationale** |
| **Preliminary Rating:** *Low Moderate* ***High*** | There is one residence and associated outbuildings present within the project area on the south perimeter. |
| **Final Rating:** *Low* ***Moderate*** *High* | There are good control lines surrounding the residence and light surface fuels with limited ladder fuels within the housing compound. Fire resources will be staged in appropriate areas of the residence during firing operations on the south side of the unit. The residence is located upwind from the typical wind direction. |
| **Technical Difficulty** | **Rationale** |
| **Preliminary Rating:** *Low* ***Moderate*** *High* | There is road access around 80% of the unit to hold fire within the unit boundaries. Fire behavior should not present suppression problems should fire become established outside the control lines. Mechanical treatment has been done along the west and east flanks reducing the risk of escape in those directions. |
| **Final Rating:** *Low* ***Moderate*** *High* | . |

**2. The Number and Dependency of Activities**

| Risk | Rationale |
|---|---|
| **Preliminary Rating:** *Low* [*Moderate*] *High* | Firing operations must be well coordinated and timed with holding forces. Firing may occur in more than one location at a time. |
| **Final Rating:** *Low* [*Moderate*] *High* | |
| **Potential Consequences** | **Rationale** |
| **Preliminary Rating:** *Low* [*Moderate*] *High* | Coordination failures increase the chance of escape or non-attainment of project objectives. |
| **Final Rating:** *Low* [*Moderate*] *High* | |
| **Technical Difficulty** | **Rationale** |
| **Preliminary Rating:** *Low* [*Moderate*] *High* | Coordination of activities requires a moderate skill level but is not highly complex. The organization required is fairly small, allowing one tactical frequency to coordinate all activities. |
| **Final Rating:** *Low* [*Moderate*] *High* | |

**3. Off-Site Values**

| Risk | Rationale |
|---|---|
| **Preliminary Rating:** *Low* [*Moderate*] *High* | There are several residences in the area, but are far enough away that the risk is relatively low when considering the expected fire behavior. |
| **Final Rating:** *Low* [*Moderate*] *High* | |
| **Potential Consequences** | **Rationale** |
| **Preliminary Rating:** *Low Moderate* [*High*] | There is one residence adjacent to the southernmost point of the project, one 3 miles east, and several 8 miles east (Greystone). There is a power line along county road 56 that goes to the adjacent residence. There are no special resource values at risk unless a large acreage burned in an escape. |
| **Final Rating:** *Low* [*Moderate*] *High* | The potential consequences are moderated when considering the expected fire behavior and fuels present surrounding the project area. |
| **Technical Difficulty** | **Rationale** |
| **Preliminary Rating:** [*Low*] *Moderate High* | Standard firefighting equipment and engines are sufficient for on and off site protection. A fuel break has been constructed, as part of a WUI project in 2002-03, along Country Road 56 near the project that provides protection for the power line. Fuels mitigation work has been completed around or near all structures mentioned above. |

| | |
|---|---|
| **Final Rating:**<br>*Low* *Moderate* *High* | |

**4. On-Site Values**

| Risk | Rationale |
|---|---|
| **Preliminary Rating:**<br>*Low* *Moderate* *High* | There are fences present within the unit. No other special resource values have been identified within the unit. |
| **Final Rating:**<br>*Low* *Moderate* *High* | |
| **Potential Consequences** | **Rationale** |
| **Preliminary Rating:**<br>*Low* *Moderate* *High* | Implementation problems could result in minor resource damage if burned at too high an intensity. Wood fence posts could be damaged. |
| **Final Rating:**<br>*Low* *Moderate* *High* | Weather and live fuel moisture will be monitored to ensure there are limited implementation problems. |
| **Technical Difficulty** | **Rationale** |
| **Preliminary Rating:**<br>*Low* *Moderate* *High* | Most fence lines are road accessible allowing engines to either pre-treat or extinguish wood posts. Some fence repair may be required after project implantation. Weather and live fuel moisture will be monitored to ensure there are limited implementation problems. |
| **Final Rating:**<br>*Low* *Moderate* *High* | |

**5. Fire Behavior**

| Risk | Rationale |
|---|---|
| **Preliminary Rating:**<br>*Low* *Moderate* *High* | There are two fuel models present resulting in differing fire behavior. Overall fuel loading is light but there are some concentrations of dead/down material and ladder fuels. Group tree torching is expected. |
| **Final Rating:**<br>*Low* *Moderate* *High* | Lighting patterns and weather conditions will be monitored to keep fire behavior within prescription. |
| **Potential Consequences** | **Rationale** |
| **Preliminary Rating:**<br>*Low* *Moderate* *High* | Fire behavior outside the unit would be about the same as than within the unit and should be within the on site holding force's ability to suppress. |
| **Final Rating:**<br>*Low* *Moderate* *High* | |
| **Technical Difficulty** | **Rationale** |
| **Preliminary Rating:**<br>*Low* *Moderate* *High* | Slop-overs or spot fires could likely be controlled using direct attack. Firing will be stopped and ignition personnel will aid in slop-over and spot fire control if necessary. |

| | |
|---|---|
| **Final Rating:**<br>*Low* [*Moderate*] *High* | |

**6. Management Organization**

| Risk | Rationale |
|---|---|
| **Preliminary Rating:**<br>*Low* [*Moderate*] *High* | A small to moderately sized organization is needed for successful project completion. |
| **Final Rating:**<br>*Low* [*Moderate*] *High* | |
| **Potential Consequences** | **Rationale** |
| **Preliminary Rating:**<br>*Low* [*Moderate*] *High* | Problems related to supervision and communication may result in increased chance of escape and failure to meet some objectives. |
| **Final Rating:**<br>*Low* [*Moderate*] *High* | |
| **Technical Difficulty** | **Rationale** |
| **Preliminary Rating:**<br>[*Low*] *Moderate* *High* | All burn team members are available locally and familiar with local factors affecting project implementation. |
| **Final Rating:**<br>[*Low*] *Moderate* *High* | |

**7. Public and Political Interest**

| Risk | Rationale |
|---|---|
| **Preliminary Rating:**<br>*Low* [*Moderate*] *High* | Smoke from the prescribed fire will be visible to local residents. If the project is implemented during hunting season, more interest will be generated due to the increased amount of people in the general area. |
| **Final Rating:**<br>*Low* [*Moderate*] *High* | |
| **Potential Consequences** | **Rationale** |
| **Preliminary Rating:**<br>*Low* [*Moderate*] *High* | Unexpected or adverse events may attract some public, political, or media attention. |
| **Final Rating:**<br>*Low* [*Moderate*] *High* | |
| **Technical Difficulty** | **Rationale** |
| **Preliminary Rating:**<br>*Low* [*Moderate*] *High* | Routine media releases as well as specific notification of area residents will be required. |

| | |
|---|---|
| **Final Rating:**<br>*Low* *Moderate* *High* | |

**8. Fire Treatment Objectives**

| **Risk** | **Rationale** |
|---|---|
| **Preliminary Rating:**<br>*Low* *Moderate* *High* | Achieving the desired burn objectives and mosaic will require coordination with all the firing operations participants as well as close monitoring of weather and fuel conditions.. |
| **Final Rating:**<br>*Low* *Moderate* *High* | |
| **Potential Consequences** | **Rationale** |
| **Preliminary Rating:**<br>*Low* *Moderate* *High* | Other management activities are not dependent on project completion. |
| **Final Rating:**<br>*Low* *Moderate* *High* | |
| **Technical Difficulty** | **Rationale** |
| **Preliminary Rating:**<br>*Low* *Moderate* *High* | There are few restrictions on techniques to achieve objectives. Pre-burn monitoring is needed to determine when unit is in prescription, as well as during-burn monitoring to determine if objectives are being met. |
| **Final Rating:**<br>*Low* *Moderate* *High* | |

**9. Constraints**

| **Risk** | **Rationale** |
|---|---|
| **Preliminary Rating:**<br>*Low* *Moderate* *High* | No burning is allowed from May 15 to June 30 due to migratory birds. |
| **Final Rating:**<br>*Low* *Moderate* *High* | |
| **Potential Consequences** | **Rationale** |
| **Preliminary Rating:**<br>*Low* *Moderate* *High* | Some burn windows may be unavailable due to spring burning constraints. |
| **Final Rating:**<br>*Low* *Moderate* *High* | |
| **Technical Difficulty** | **Rationale** |
| **Preliminary Rating:**<br>*Low* *Moderate* *High* | This is scheduled to be a Spring or Fall Burn, but Spring burning constraints may increase the time it takes to complete this project if the Fall window does not allow us to implement the burn. |

| | |
|---|---|
| **Final Rating:**<br>*Low* [*Moderate*] *High* | |

**10. Safety**

| **Risk** | **Rationale** |
|---|---|
| **Preliminary Rating:**<br>*Low* [*Moderate*] *High* | Safety issues are normal for the fuel type and topography and are easily identifiable. There is a part time residence adjacent to the southern portion of the unit. Proper PPE will be used by firefighters and ATV/UTV riders. There is no public road access to the unit which reduces the risk of civilian personnel being in the area. |
| **Final Rating:**<br>[*Low*] *Moderate* *High* | Burning will be coordinated with the residents to eliminate risk to them. |
| **Potential Consequences** | **Rationale** |
| **Preliminary Rating:**<br>[*Low*] *Moderate* *High* | The normal potential consequences for accident or injury to firefighters exist as compared to other fire related activities, but little potential for accident or injury to the public exists. |
| **Final Rating:**<br>[*Low*] *Moderate* *High* | |
| **Technical Difficulty** | **Rationale** |
| **Preliminary Rating:**<br>[*Low*] *Moderate* *High* | Safety concerns can be easily mitigated through LCES and a standard safety briefing. |
| **Final Rating:**<br>[*Low*] *Moderate* *High* | |

**11. Ignition Procedures/Methods**

| **Risk** | **Rationale** |
|---|---|
| **Preliminary Rating:**<br>*Low* [*Moderate*] *High* | Firing sequence and timing must be coordinated among lighters in order to best meet objectives. Most of the area is readily visible to the ignition specialist and burn boss. |
| **Final Rating:**<br>*Low* [*Moderate*] *High* | |
| **Potential Consequences** | **Rationale** |
| **Preliminary Rating:**<br>*Low* [*Moderate*] *High* | Firing procedures must be coordinated to provide adequate safety and to meet project objectives. |
| **Final Rating:**<br>*Low* [*Moderate*] *High* | |
| **Technical Difficulty** | **Rationale** |

| | |
|---|---|
| **Preliminary Rating:**<br>*Low* [*Moderate*] *High* | No special firing equipment, techniques, or patterns are required; however firing procedures must be coordinated in order to meet project objectives and reduce the risk of adverse events. |
| **Final Rating:**<br>*Low* [*Moderate*] *High* | |

**12. Interagency Coordination**

| **Risk** | **Rationale** |
|---|---|
| **Preliminary Rating:**<br>[*Low*] *Moderate* *High* | No other agency is involved but there is a private land owner involved. |
| **Final Rating:**<br>[*Low*] *Moderate* *High* | |
| **Potential Consequences** | **Rationale** |
| **Preliminary Rating:**<br>[*Low*] *Moderate* *High* | Only the BLM is involved. The grazing permitee and land owner are fully supportive of the project |
| **Final Rating:**<br>[*Low*] *Moderate* *High* | |
| **Technical Difficulty** | **Rationale** |
| **Preliminary Rating:**<br>[*Low*] *Moderate* *High* | No interagency issues. |
| **Final Rating:**<br>[*Low*] *Moderate* *High* | |

**13. Project Logistics**

| **Risk** | **Rationale** |
|---|---|
| **Preliminary Rating:**<br>[*Low*] *Moderate* *High* | Little logistical support is needed. |
| **Final Rating:**<br>[*Low*] *Moderate* *High* | |
| **Potential Consequences** | **Rationale** |
| **Preliminary Rating:**<br>[*Low*] *Moderate* *High* | Logistical failures will not increase the risk of escape. |
| **Final Rating:**<br>[*Low*] *Moderate* *High* | |

| Technical Difficulty | Rationale |
|---|---|
| **Preliminary Rating:** [Low] *Moderate High* | Supplies and personnel are easy to obtain. |
| **Final Rating:** [Low] *Moderate High* | |

**14. Smoke Management**

| Risk | Rationale |
|---|---|
| **Preliminary Rating:** [Low] *Moderate High* | There are few smoke concerns due to the remoteness of the site. Area residents and the land owner have not expressed concerns about smoke. |
| **Final Rating:** [Low] *Moderate High* | |
| **Potential Consequences** | **Rationale** |
| **Preliminary Rating:** [Low] *Moderate High* | Minor impacts to isolated residences may occur. Firefighter exposure to smoke should be minimal or for short duration. |
| **Final Rating:** [Low] *Moderate High* | |
| **Technical Difficulty** | **Rationale** |
| **Preliminary Rating:** [Low] *Moderate High* | No special operational procedures are required. Normal smoke permit stipulations apply. Area residents will be notified as to when implementation will occur. |
| **Final Rating:** [Low] *Moderate High* | |

COMPLEXITY RATING SUMMARY

RISK — OVERALL RATING: **MODERATE**

POTENTIAL CONSEQUENCES — OVERALL RATING: **MODERATE**

TECHNICAL DIFFICULTY — OVERALL RATING: **MODERATE**

**SUMMARY COMPLEXITY RATING: MODERATE**

RATIONALE: This project rates as an overall moderate complexity burn. The main reasons for rating moderate include: the broadcast nature of the burn, proximity to adjacent and isolated residences, and burn objectives.

Prepared by: Ron Simpson Date: 9/15/2010

Approved by: David E B. Lockstein Date: 9/15/2010
(Agency Administrator)

## C. Risk Management Analysis

Form 1112-5
(May 2001)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
**RISK MANAGEMENT WORKSHEET**

| 1. Organization and Location<br>DOI/BLM/CRD | | | 2. Page |
|---|---|---|---|
| 3. Operation / Task<br>**PRESCRIBED FIRE OPERATIONS** | 4. Beginning Date:<br>**11/30/06** | 5. Ending Date:<br>**INDEFINATE** | 6. Date Prepared<br>**11/15/05** |

7. Prepared by *(Name / Duty Position)*
*Micahael St. Martin/ Assistant Engine Module Leader*

| 8. Identified Hazards | 9. Assess the Hazards: Initial Risk | | | | 10. Control Measures Developed for Identified Hazards: *(Specific measures taken to reduce the probability of a hazard)* | 11. Assess the Hazard's Residual Risk: | | | | 12. How to Implement the Controls: (May Be Filled in By Hand) | 13. Supervisors and Evaluation by: (Continuous Leader Checks, Buddy |
|---|---|---|---|---|---|---|---|---|---|---|---|
| (Be Specific) | L | M | H | E | (Be Specific) | L | M | H | E | (Be Specific) | (Be Specific) |
| **DRIVING TO THE WORK SITE** | | | | | | | | | | 1. Attend Defensive Driving training every 3 years. (H-1112-2 chap. 4.2 "Driver training") | Continuous fireline supervisor checks, tailgate safety sessions and operational safety briefings conducted prior to each shift. |
| **1-1 General operations and public traffic** | | | X | | 1- Use defensive driving techniques at all times | X | | | | | |
| **1-2 Steep, narrow roads** | | | X | | 2- Drive cautiously so that you can stop in less than twice of your usual distance. Drive with headlights on | X | | | | 2. Maintain and operate vehicles as recommended by the manufacturer. (H-1112-2 chap. 4.4 "Vehicle Servicing and Repair") | |
| **1-3 Unsecured loads** | | X | | | | X | | | | | |
| **1-4 Hauling flammable substances** | X | | | | 3- Secure loads for before departing - use tie downs | X | | | | | |
| **1-5 Transporting sharp tools** | X | | | | | | | | | | |
| **1-6 Loading vehicles** | X | | | | 4- Use appropriate containers for hauling diesel and/or gasoline. Flammable solids should be in appropriate containers and secured | X | | | | 3. Inspect tie downs, and test security of loads. (H-1112-2 chap. 4.4 "Vehicle Servicing and Repair" G) | |

**CONTINUED**

| 8. Identified Hazards | 9. Assess the Hazards: Initial Risk | | | | 10. Control Measures Developed for Identified Hazards: *(Specific measures taken to reduce the probability of a* | 11. Assess the Hazard's Residual | | | | 12. How to Implement the Controls: (May Be Filled in By Hand) | 13. Supervisors and Evaluation by: (Continuous |
|---|---|---|---|---|---|---|---|---|---|---|---|
| (Be Specific) | L | M | H | E | (Be Specific) | L | M | H | E | (Be Specific) | (Be Specific) |
| | | | | | | | | | | 4. Check on the most updated approved containers. (H-1112-2 chap. 4.4 "Vehicle Servicing and Repairs"J)<br><br>5. Make sure latches are secure and tie downs are in operating condition. (H-1112-2 chap. 4.4 "Vehicle Servicing and Repairs" F)<br><br>6. Use proper ergonomic techniques. Ask if you need assistance lifting heavy objects. (H-1112-2 chap. 7.8 "Work Practice Controls") | |
| **DRIVING AT OR NEAR THE WORK SITE** | | | | | | | | | | | |
| **2-1 Backing or turning in small areas** | | X | | | 1- Use spotters. Face the hazard while turning around. Avoid tight turn around if possible. | X | | | | 1. Attend Defensive Driving training every 3 years. "Interagency Standards for Fire and Aviation Operations" (ISFFAO) chap 6.5 "General Driving Policy" | |
| **2-2 Heavy truck traffic between units and water source** | | | X | | 2- Maintain radio communications and alert other drivers in the area. Use headlights whenever driving. Use light bars and/or warning lights. | X | | | | | |
| **2-3 Smoke, dust, poor visibility.** | | | X | | | | | | | | |
| **2-4 Parking near a prescribed burn** | | X | | | 3- Place a guide on foot ahead of the vehicle. Wait until smoke is less dense. | X | | | | 2. Use emergency lights only when authorized according to the | |

**CONTINUED**

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|---|---|---|---|---|---|---|---|---|---|---|---|
| (Be Specific) | L | M | H | E | (Be Specific) | L | M | H | E | (Be Specific) | (Be Specific) |
| **2-5 Public Safety** | | | X | | Lights on. Use light bars and/or warning lights. Consider dust abatement if severe dust conditions persist. | | | | | ISFFAO chap. 6.7 "Fire vehicle operation standards." Attend radio communication training as determined by agency. | |
| **2-6 Wet, icy, or loose pavement** | | | X | | 4- Use parking brake and choke blocks. Leave keys in ignition; avoid leaving exposed flammables in bed of vehicle. All windows closed. Park vehicles in cleared areas, or in areas containing only light fuels. | X | | | | 3, 4. Attend Defensive driving training every 3 years. (ISFFAO chap 6.5 "General Driving Policy") | |
| | | | | | 5- Post signs and/or use road guards or blocks if necessary. | X | | | | 5. Get additional assistance from law enforcement or other personnel if necessary. Refer to Fireline Handbook (FLHB) chap. 6 "urban interface" if assignment calls for. | |
| | | | | | 6- Reduce speed<br>-increase following distance/ time to 4 seconds<br>- Insure proper tire inflations as per info on tire | X | | | | 6. Defensive Driver Training will be provided. | 6. Supervisor will spot check for performance. |
| **DRIVING ATVs.** | | | | | | | | | | | |
| **3-1 Vehicle maintenance.** | | | X | | 1a- Operated by trained and licensed drivers only. Lights on. Avoid steep slopes. Use extreme caution when traversing slopes with loads. Approved helmets to be used by all operators. | X | | | | 1. Attend ATV training and keep current on refreshers. (H1112-1, chap. 13) | |
| **3-2 Close proximity to fire, intense heat, erratic fire behavior.** | | | X | | | | | | | | |
| **3-3 Rough terrain, heavy ground fuels, side hills and slopes.** | | | X | | 1b- Thorough inspection of vehicles and ignition equipment. | X | | | | 2. Refer to BLM handbook 1112-2 chap. 4.6 for proper PPE. Attend ATV refresher to remain current with equipment. (H 1112-1 | |
| **3-4 Noise of ATV and fire obscures verbal warnings.** | | X | | | 2- Use hand held radios, close supervision, lookouts. All personnel will | X | | | | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| (Be Specific) | L | M | H | E | (Be Specific) | L | M | H | E | (Be Specific) | (Be Specific) |
| | | | | | be equipped with proper PPE, including nomex shirts and pants, leather boots and gloves, hard hats, fire shelters, and eye protection.<br><br>3- Scout and locate accessible routes before they are traveled, make dry run with experienced operator or supervised trainee. Fire by hand if needed.<br><br>4- Hand held radios required of all ignition personnel. Hard hats instead of helmets to facilitate communications. | <br><br>X<br><br>X | | | | chap. 13)<br><br>3. Walk if routes are inaccessible. Follow ATV operations guide from Off road training.<br><br>4. Be sure all personnel are familiar with radio operations. Wear PPE. (H-1112-2 chap. 4.6) | |
| **HANDLING FLAMMABLE MATERIALS** | | | | | | | | | | | |
| **4-1 Inadvertent ignitions.**<br><br>**4-2 Exposure to sparks.**<br><br>**4-3 Eye or skin contamination from fuel.**<br><br>**4-4 Leaking containers or torches.**<br><br>**4-5 Improper gas/diesel ratios for burn fuel.**<br><br>**4-6 Slippery surfaces from spilled fuel.** | | X<br><br>X<br><br>X<br><br>X<br><br>X<br><br>X | | | 1- Preplan ignition on/off points, check wand apparatus on regular basis. Notify holding crew.<br><br>2- Use proper containers, move away from hot areas, no smoking.<br><br>3- Gloves, goggles, leather lace-up boots, and nomex clothing required.<br><br>4- Empty and tag in field, have repairs made before next use.<br><br>5- Use labels on containers, field test small amounts before use.<br><br>6- Make every effort to avoid spilling fuel, where feasible. Install non-slip material on fuel truck beds. Clean up spills as soon as possible. | X<br><br>X<br><br>X<br><br>X<br><br>X<br><br>X | | | | 1. Remain in communication with all personnel. Be sure everyone is briefed and knows how to perform tasks. (ISFFAO chap.18 "Safety")<br><br>2. Keep current on approved fuel containers.<br><br>3. Avoid skin exposure to fuel and follow MSDS for mitigation measures.<br><br>4. Be sure to repair or dispose of malfunctioning fuel containers. Refer to MSDS for materials used. | |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| (Be Specific) | L | M | H | E | (Be Specific) | L | M | H | E | (Be Specific) | (Be Specific) |
| **EQUIPMENT SET UP** | | | | | | | | | | 5. Be sure everyone knows proper ratios and tags containers appropriately. Burn mixtures are 4:1 or 3:2 as taught in S-234 "Ignition Operations."<br><br>6. Use containment berms when appropriate. Dispose of fuel according to MSDS. | |
| **5-1 Muscle or back strain lifting heavy objects.** | | | X | | 1- Use proper lifting techniques. Get help if items are too heavy. | X | | | | 1. Know proper lifting techniques. Refer to H-1112-2 chap. 7.8 "Work Practice Controls." | |
| **5-2 Operating pumps and mechanized equipment: exhaust burns, loose clothing.** | | X | | | 2- Tuck in shirt tails, remove scarves and jewelry. Proper clothing, gloves, and boots. | X | | | | 2. Use PPE according to ISFFAO chap. 18 "Safety Equipment." | |
| **5-3 Application of slippery retardant, poor footing** | | X | | | 3- Eight-inch lug sole, lace-up boots. Avoid slick areas if possible. | X | | | | 3. Wear PPE. (ISFFAO chap. 6 "PPE") Avoid spilling if possible, use funnel. | |
| **5-4 Crew people working uphill from each other (rolling debris).** | | X | | | 4- Post lookouts. Shout warnings. | X | | | | 4. Utilize "Risk Management Process" (Incident Response Pocket Guide –IRPG). Keep in communication with all personnel. | |
| **5-5 Operating high pressure nozzles.** | | X | | | 5- Maintain visual contact with pump operator and other crew members, whenever possible. Use backup person behind the nozzle man. Eye protection required for nozzle operators. | X | | | | | |
| **5-6 Traversing rocky terrain.** | | X | | | | | | | | | |
| **5-7 Noise from pumps and saws.** | | X | | | 6- Eight inch lug sole boots, slow cautious movement. Carry tools and equipment on downhill side when traversing slopes. | X | | | | 5. Wear all PPE. (ISFFAO chap. 6 | |

**CONTINUED**

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|---|---|---|---|---|---|---|---|---|---|---|---|
| (Be Specific) | L | M | H | E | (Be Specific) | L | M | H | E | (Be Specific) | (Be Specific) |
| | | | | | 7- Use hearing protection (ear plugs or muffs). | X | | | | "PPE") Do not point nozzle at others, even when not charged.<br><br>6. Refer to "Wildland Fire Watch out Situation # 17" (IRPG). Use sheaths on tools when possible.<br><br>7. Use proper PPE for different equipment. Be sure all personnel are equipped with ear protection. | |
| **FIRING OPERATIONS (HAND IGNITION** | | | | | | | | | | | |
| **6-1 Rolling debris** | | X | | | 1- Use hand held radios, close supervision, and lookouts. Consider aerial ignition. | X | | | | 1. Remain in communication with all personnel. Consult the Risk Management Process. (IRPG) | |
| **6-2 Close proximity to intense heat and erratic fire behavior.** | | | X | | | | | | | | |
| **6-3 Smoke, sparks, and cinders.** | | X | | | 2- Use hand held radios, close supervision, and lookouts. All personnel wear required PPE including Nomex shirts and pants, hard hat, leather gloves, eight-inch leather, lug sole boots, and fire shelters. | X | | | | 2. Be sure all personnel are familiar with location of safety zones and have proper PPE. (ISFFAO Chap. 6 "PPE") Have a plan to pull crews to safety. (Fire Orders 4-6 IRPG) | |
| **6-4 Poor footing, steep slopes, heavy fuels.** | | X | | | | | | | | | |
| **6-5 Noise of fire obscures verbal warnings.** | | X | | | | | | | | | |
| **6-6 Burning fuel dripping from torches. Burns from drip torches.** | | X | | | 3- Avoid very dense smoke whenever possible. Alter firing patterns. Rotate personnel out of the worst smoke areas. | X | | | | | |
| **6-7 Misguided lighter lighting wrong area(s).** | X | | | | 4- Constant awareness, learn to identify hazard area(s). Slow down. Work in pairs and post lookouts when needed. | X | | | | 3. Refer to Fire Orders 4-6, IRPG. Stop lighting if visibility and communication are compromised. | |
| | | | | | 5- Hand held radios for all ignition | X | | | | 4. Scout areas with | |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| (Be Specific) | L | M | H | E | (Be Specific) | L | M | H | E | (Be Specific) | (Be Specific) |
| | | | | | personnel. Maintain communications between ignition and holding personnel.<br><br>6- Lighters stay alert to where torch head is. Close air vent when not actually lighting.<br><br>7- Know location of others. Radios for all lighting personnel. Close supervision. Conduct briefing for all personnel prior to ignition operations. | <br><br>X<br><br><br><br>X | | | | potential hazards. Notify others of destination and route. (H-1112-2 topic 3.4 "Foot Travel")<br><br>5. Be sure all personnel carry a radio and know how to use it. (ISFFAO chap. 16 "Effective Radio Use")<br><br>6. Be sure all personnel are trained in drip torch use. If burns occur, have individuals that are trained in burn treatment. (IRPG pg. 39 "Burn Injury Treatment")<br><br>7. Have all personnel trained in lighting techniques and procedures. (S-234, Ignition Operations) Keep an experienced lighter with less experienced personnel. | |
| **FIRING (QUOIN GUN FLARES)** | | | | | | | | | | | |
| **7-1 Risks associated with firing projectiles or flares.**<br><br>**7-2 Inadvertent firing over/under shot resulting in activity outside project boundaries.** | | X | <br><br>X | | 1- Basic firearms safety rules followed, separation of ammo by type and size, access to launchers limited to trained personnel or those undergoing training.<br><br>2- Post lookouts. Notify ignition specialist and holding specialist. Holding crews extinguish spot subsequent to | | X | | | 1. Wear PPE, including ear protection. (ISFFAO chap. 6 "PPE") Obtain firearms certification, or attend hunter's education.<br><br>2. Be sure only trained, | |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| (Be Specific) | L | M | H | E | (Be Specific) | L | M | H | E | (Be Specific) | (Be Specific) |
| | | | | | further ignition. Maintain constant communications between ignition and holding personnel. | | | | | certified personnel operate Quoin gun. Refer to Fire Orders 5 and 6, IRPG) | |
| **FIRING (QUICK STUBBY FLARES)** | | | | | | | | | | | |
| **8-1 Burns** | | X | | | 1- Full PPE required (Leather Gloves/Nomex/Sleeves down) | X | | | | 1. Wear PPE. (ISFFAO chap. 6 "PPE") Be aware of burn treatment procedures. (IRPG pg. 39) | |
| **8-2 Inadvertent ignition of flares** | | X | | | 2a- Flares should be carried in pack or other container that can be discarded in the event of accidental ignition, **NOT IN FIREFIGHTER CLOTHING** | X | | | | | |
| | | | | | 2b- Transport flares in original packaging Secure flares with fiber tape to prevent cover from detaching and exposing the fuse to ignition source | X | | | | 2. Be sure only trained, certified personnel operate equipment. Read precautions on flare package. | |
| **FIRING (TERRA TORCH)** | | | | | | | | | | | |
| **9-1 Intrinsic danger of using terra torch.** | | X | | | 1- Terra torch is to be operated under supervision of the ignition specialist. | X | | | | 1. Only agency trained, certified personnel are to operate terra-torch. Training is position specific. | |
| **9-2 Vehicle maintenance** | | X | | | 2a- Use only with trained operator=s i.e., driver, operator, and engine support. | X | | | | | |
| **9-3 Close proximity to fire, intense heat, erratic fire behavior.** | | X | | | 2b-Thorough inspection of vehicle and ignition equipment. Electrical connections and grounds all in working order. | | | | | 2. Be sure driver is qualified to operate vehicle. (H-1112-2 topic 4 "Types of Operators") | |
| **9-4 Rough terrain/roads, ground fuels, side hills and slopes.** | | X | | | | | | | | | |
| | | | | | 3- Use hand held radios, close supervision, and lookouts. Proper PPE required for firing with torch. Consider discreet frequency for firing operations using terra torch. | X | | | | 3. All personnel should be trained in radio use annually. Wear PPE. (Specialized PPE is required for terra-torch operations) | |
| **9-5 Chemical exposure, mixing/transferring.** | | | X | | | | | | | | |
| **9-6 Flammable vapors, liquids, and solids.** | | X | | | | | | | | | |
| | | | | | 4- Terra torch use restricted to roads or two tracks, pre-scouted paths or routes only. Fire by hand if necessary. | X | | | | | |
| **9-7 Slippery surfaces from spilled fuels.** | | X | | | | | | | | 4. All personnel should attend Defensive | |

CONTINUED

| 8. Identified Hazards | 9. Assess the Hazards: Initial Risk | | | | 10. Control Measures Developed for Identified Hazards: *(Specific measures taken to reduce the probability of a* | 11. Assess the Hazard's Residual | | | | 12. How to Implement the Controls: (May Be Filled in By Hand) | 13. Supervisors and Evaluation by: (Continuous |
|---|---|---|---|---|---|---|---|---|---|---|---|
| (Be Specific) | L | M | H | E | (Be Specific) | L | M | H | E | (Be Specific) | (Be Specific) |
| | | | | | 5- Trained personnel only. Well ventilated area. All containers grounded. Cotton clothing required for all mixing crew personnel. | X | | | | Driving training every 3 years. (H-1112-2, topic 4 "Driver Training") Be able to recognize hazards and adjust tactics. | |
| | | | | | 6- Terra torch mixing group will wear 100% cotton clothing. All containers grounded. Clean up all spills. | X | | | | 5, 6. All personnel operating terra-torch should attend DOT Haz-Mat training annually. | |
| | | | | | 7- Make every effort to avoid spilling fuel; install non-slip material on decking, absorbent material for spills will be in torch kit. | X | | | | 7. Wear PPE as required. Follow standards according to proper set-up of equipment. Refer to MSDS for fuel disposal. | |
| **FIRING (HELITORCH, PSD)** | | | | | | | | | | | |
| **10-1 Hazards of aircraft use combined with ignition systems.** | | | X | | 1- Aerial ignition apparatus thoroughly maintained, inspected, and tested before installing with aircraft. Pilot has ultimate GO/NO GO authority. | X | | | | 1. Only agency qualified individuals operate helitorch. Mitigate aircraft hazards. (ISFFAO chap. 17 "Mission Planning/ Hazard Mitigation") | |
| **10-2 Apparatus viability** | | | X | | | | | | | | |
| **10-3 Flight routes, project area and flight following coordinates (MOA=s, TFR=s, etc).** | | | X | | 2- Aviation operations to be coordinated by certified personnel. HECM on project site. Trained and experienced personnel operating ignition equipment. **Separate operating plan and JHA developed.** | X | | | | 2. Refer to Risk Assessment for helicopter operations. Brief all personnel thoroughly before each flight. Be sure all necessary positions are filled by qualified individuals. (IHOG) | |
| | | | | | 3- Follow guidelines and restrictions as stated in IHOG, file special use safety plan, coordinate w/Forest Aviation Officer and Dispatch Centers. | | X | | | | |

**CONTINUED**

| 8. Identified Hazards | 9. Assess the Hazards: Initial Risk | | | | 10. Control Measures Developed for Identified Hazards: *(Specific measures taken to reduce the probability of a* | 11. Assess the Hazard's Residual | | | | 12. How to Implement the Controls: (May Be Filled in By Hand) | 13. Supervisors and Evaluation by: (Continuous |
|---|---|---|---|---|---|---|---|---|---|---|---|
| (Be Specific) | L | M | H | E | (Be Specific) | L | M | H | E | (Be Specific) | (Be Specific) |
| **HOLDING (INCLUDES EQUIPMENT SETUP)** | | | | | | | | | | 3. Follow guidelines outlined by ISFFAO chap. 17 "Aviation Operations" and the "IHOG" for specific rules. Be sure qualified personnel are performing assigned duties. | |
| **11-1 Carrying sharp tools.** | | X | | | 1- Keep tool guards on while traveling, remove only while in use. All required PPE worn (See Section 6 - Firing Operations). | X | | | | 1. Follow hand tool use as demonstrated in S-130/190. All personnel should be trained, minimally, with this class. Wear PPE. (ISFFAO chap. 6 "PPE") | |
| **11-2 Tool use.** | | X | | | | | | | | | |
| **11-3 Snag falling.** | | X | | | 2- Proper crew training, with close supervision by crew boss(es) and holding specialist. | X | | | | | |
| **11-4 Burned off snags or widow-makers.** | | X | | | | | | | | | |
| **11-5 Burns from radiant heat and hot embers.** | | X | | | 3- Falling/ bucking to be done only by trained and certified personnel only. | X | | | | 2. All personnel should attend S-130/190 to learn basic tool use. (H-1112-2 chap. 12 "Portable Hand Tools") | |
| **11-6 Rolling debris.** | | X | | | 4- Avoid entering burned over area. Post lookout(s) and flag hazards. Obtain professional faller if needed. | X | | | | | |
| **11-7 Erratic fire behavior.** | | X | | | | | | | | | |
| **11-8 Slippery, wet surfaces.** | | X | | | 5- Nomex clothing, hard hats, and gloves required. | X | | | | 3. All chainsaw operators must attend S-212, Chainsaw Operations and be certified as an A, B, or C faller. | |
| | | | | | 6- Post lookouts, brief crew as to potential hazard areas. | X | | | | | |
| | | | | | 7- To be covered by burn boss in pre-burn briefing, escape route(s) and safety zones shall be known by all personnel. | X | | | | 4. Check qualifications of fallers and have a qualified individual determine type of faller needed. (IRPG pg. 73 | |
| | | | | | 8- All PPE required (See Section 6 - | X | | | | | |

**CONTINUED**

| 8. Identified Hazards | 9. Assess the Hazards: Initial Risk | | | | 10. Control Measures Developed for Identified Hazards: *(Specific measures taken to reduce the probability of a* | 11. Assess the Hazard's Residual | | | | 12. How to Implement the Controls: (May Be Filled in By Hand) | 13. Supervisors and Evaluation by: (Continuous |
|---|---|---|---|---|---|---|---|---|---|---|---|
| (Be Specific) | L | M | H | E | (Be Specific) | L | M | H | E | (Be Specific) | (Be Specific) |
| | | | | | Firing Operations). | | | | | "Procedural Chainsaw Operations")<br><br>5. Wear PPE. (ISFFAO chap. 6 "PPE")<br><br>6. Scout travel areas if possible. Refer to Fire Order 5.<br><br>7. Be sure all personnel receive a thorough briefing and are aware of what to do in erratic conditions. Keep in communication with everyone- be sure all are trained in radio operation annually.<br><br>8. Wear PPE. (ISFFAO chap. 6 "PPE") Watch footing. | |
| **MOP-UP (INCLUDES ALL HAZARDS IN EQUIPMENT SET UP, FIRING, AND HOLDING)** | | | | | | | | | | | |
| **12-1 Smoke inhalation.** | | | X | | 1- Crews will be rotated in and out of dense smoke. | X | | | | 1. If smoke persists, consider disengaging completely. Fill out appropriate paperwork if exposure to smoke is extreme. (CA-1, CA-2) | |
| **12-2 Fatigue, long hours of work.** | | X | | | 2- Shifts of duty shall not exceed 12 hours, except in emergencies. Crews will work no longer than 7 days on with 1 day off or 14 on with 2 off. Work in pairs, have rested drivers available. | X | | | | 2. Follow work-rest guidelines. (ISFFAO chap. 6 "Work/Rest") | |

**CONTINUED**

| 8. Identified Hazards | 9. Assess the Hazards: Initial Risk | | | | 10. Control Measures Developed for Identified Hazards: *(Specific measures taken to reduce the probability of a* | 11. Assess the Hazard's Residual | | | | 12. How to Implement the Controls: (May Be Filled in By Hand) | 13. Supervisors and Evaluation by: (Continuous |
|---|---|---|---|---|---|---|---|---|---|---|---|
| (Be Specific) | L | M | H | E | (Be Specific) | L | M | H | E | (Be Specific) | (Be Specific) |
| | | | | | | | | | | **H-1112-2: Safety and Health for Field Operations, BLM Manual Handbook 1112-2**<br><br>**ISFFAO: Interagency Standards for Fire and Fire Aviation Operations, NFES 2724**<br><br>**IRPG: Interagency Incident Response Pocket Guide, NFES 1077**<br><br>**FLHB: Fireline Handbook, NFES 0065** | |

| 14. Remaining Risk Level After Control Measures Are Implemented: (CIRCLE HIGHEST REMAINING RISK LEVEL) | **LOW** (Line Supervisor) | **MEDIUM** (Branch Chief) | **HIGH** (District Manager | **EXTREMELY HIGH** (Must be State Director/Associate) |
|---|---|---|---|---|

15. RISK DECISION AUTHORITY: **(Approval/Authority Signature Block)** (If Initial Risk Level is Medium, High or Extremely High, Brief Risk Decision Authority at that level on Controls and Control Measures used to reduce risks) (**Note**: if the person preparing the form signs this block, the signature indicates only that the appropriate risk decision authority was notified of the initial risk level, control measures taken and appropriate resources requested; and that the risk was accepted by the decision authority.)

## Appendix D. FIRE BEHAVIOR MODELING DOCUMENTATION OR EMPIRICAL DOCUMENTATION

**Following is the fuel moisture scenarios common to all Behave runs:**
D1L1 - Very low dead, fully cured herbaceous (3,4,5,30,60)
D1L2 - Very low dead, 2/3 cured herbaceous (3,4,5,60,90)
D2L2 - Low dead, 2/3 cured herbaceous (6,7,8,60,90)

BehavePlus 4.0.0 (Build 276)
**sagebrush**
Sun, Aug 22, 2010 at 14:21:11

### Input Worksheet

**Inputs: SURFACE**

| Input Variables | Units | Input Value(s) |
|---|---|---|
| **Fuel/Vegetation, Surface/Understory** | | |
| Fuel Model | | gs2 |
| **Fuel Moisture** | | |
| Moisture Scenario | | d1l1, d1l2, d2l2 |
| **Weather** | | |
| Midflame Wind Speed (upslope) | mi/h | 2.0, 6.0, 10.0, 14.0 |
| **Terrain** | | |
| Slope Steepness | % | 0 |
| **Notes** | | |

### Run Option Notes

Maximum reliable effective wind speed limit IS imposed [SURFACE].

Calculations are only for the direction of maximum spread [SURFACE].

Fireline intensity, flame length, and spread distance are always for the direction of the spread calculations [SURFACE].

Wind is blowing upslope [SURFACE].

### Results for Surface Rate of Spread (maximum) (ch/h)

| Moisture Scenario | Midflame Wind Speed (upslope) mi/h |
|---|---|

| | 2.0 | 6.0 | 10.0 | 14.0 |
|---|---|---|---|---|
| d1l1 | 11.6 | 50.2 | 103.7 | 168.2 |
| d1l2 | 7.6 | 33.1 | 68.4 | 111.0 |
| d2l2 | 6.8 | 29.5 | 61.0 | 99.0 |

## Results for: Flame Length (ft)

| Moisture Scenario | Midflame Wind Speed (upslope) mi/h | | | |
|---|---|---|---|---|
| | 2.0 | 6.0 | 10.0 | 14.0 |
| d1l1 | 4.0 | 7.9 | 11.1 | 13.9 |
| d1l2 | 3.2 | 6.3 | 8.7 | 10.9 |
| d2l2 | 2.9 | 5.7 | 7.9 | 9.9 |

## End

BehavePlus 4.0.0 (Build 276)

**TL3-P/J**

Sun, Aug 22, 2010 at 14:26:17

## Input Worksheet

**Inputs: SURFACE, CROWN**

| Input Variables | Units | Input Value(s) |
|---|---|---|
| **Fuel/Vegetation, Surface/Understory** | | |
| Fuel Model | | tl3 |
| **Fuel/Vegetation, Overstory** | | |
| Canopy Base Height | ft | 4 |
| Canopy Bulk Density | lb/ft3 | .04 |
| **Fuel Moisture** | | |
| Moisture Scenario | | d1l1, d1l2, d2l2 |
| Foliar Moisture | % | 85 |
| **Weather** | | |

| | | |
|---|---|---|
| 20-ft Wind Speed (upslope) | mi/h | 2, 6, 10, 14 |
| Wind Adjustment Factor | | .5 |

**Terrain**

| | | |
|---|---|---|
| Slope Steepness | % | 0 |

**Notes**

## Run Option Notes

Maximum reliable effective wind speed limit IS imposed [SURFACE].

Calculations are only for the direction of maximum spread [SURFACE].

Fireline intensity, flame length, and spread distance are always for the direction of the spread calculations [SURFACE].

Wind is blowing upslope [SURFACE].

## Results for: Surface Rate of Spread (maximum) (ch/h)

| Moisture Scenario | 20-ft Wind Speed (upslope) mi/h | | | |
|---|---|---|---|---|
| | 2 | 6 | 10 | 14 |
| d1l1 | 0.5 | 1.3 | 2.3 | 3.5 |
| d1l2 | 0.5 | 1.3 | 2.3 | 3.5 |
| d2l2 | 0.4 | 1.0 | 1.7 | 2.6 |

## Results for: Flame Length (ft)

| Moisture Scenario | 20-ft Wind Speed (upslope) mi/h | | | |
|---|---|---|---|---|
| | 2 | 6 | 10 | 14 |
| d1l1 | 0.6 | 1.0 | 1.3 | 1.6 |
| d1l2 | 0.6 | 1.0 | 1.3 | 1.6 |
| d2l2 | 0.5 | 0.8 | 1.0 | 1.3 |

## Results for: Crown ROS (ch/h)

| Moisture Scenario | 20-ft Wind Speed (upslope) mi/h |
|---|---|

| | 2 | 6 | 10 | 14 |
|---|---|---|---|---|
| d111 | 7.3 | 18.8 | 34.4 | 53.1 |
| d112 | 5.7 | 14.8 | 27.1 | 41.7 |
| d212 | 4.8 | 12.5 | 22.9 | 35.3 |

## Results for: Active Crown Fire?

| Moisture Scenario | 20-ft Wind Speed (upslope) mi/h | | | |
|---|---|---|---|---|
| | 2 | 6 | 10 | 14 |
| d111 | No | Yes | Yes | Yes |
| d112 | No | Yes | Yes | Yes |
| d212 | No | No | Yes | Yes |

## Results for: Fire Type

| Moisture Scenario | 20-ft Wind Speed (upslope) mi/h | | | |
|---|---|---|---|---|
| | 2 | 6 | 10 | 14 |
| d111 | Surface | CondCrown | CondCrown | CondCrown |
| d112 | Surface | CondCrown | CondCrown | CondCrown |
| d212 | Surface | Surface | CondCrown | CondCrown |

| **Appendix E. BURN BOSS REPORT** | PROJECT NAME: | Jack Springs II | PREPARED BY: | BRIAN VEAGER |
|---|---|---|---|---|
| | BURN UNIT: | Jack Springs II | DATE: | 9/30/10 |
| | IGNITION TIME: | 1235 | | |

## *ON-SITE FUEL MOISTURE AND WEATHER CONDITIONS*

| WEATHER OBSERVATIONS | | | FUEL MOISTURE | | |
|---|---|---|---|---|---|
| TEMPERATURE | RH | WIND | Sagebrush Live FM % | State of Grass Curing | 1000 HR FM % |
| 1010 64° | 22% | CALM | 84% (9/24) | CURED | ? → 15% (9/24) |
| 1200 79° | 8% | 1 E ← (KESTRAL) | | | 7% (9/30) |
| 1230 78° | 15% | 1 E | | | |
| 1330 80° | 12% | 1-2 E | | | |
| 1510 82° | 14% | 1-2 W | | | |
| 1730 81° | 16% | 1-2 S | | | |

9/24

SAMPLE QUESTIONED TO HIGH.

## *ACHIEVEMENT OF PRESCRIBED FIRE OBJECTIVES*

| SHORT TERM OBJECTIVES: | RESULTS: |
|---|---|
| 1. Reduce fuels 50% - 70% of the target area.<br>2. Provide an effective fuel break from County Rd. 56 north to an old burn by jack springs. | |

## *BURN BOSS COMMENTS*

(IE, FIRE BEHAVIOR, PERSONNEL, EQUIPMENT, PERFORMANCE, ETC.)

TEST BURN WENT WELL. STARTED IGNITION @ 1235 WINDS OUT OF EAST. LIGHT TO THE NORTH ON ROLLER CHOP LINE, WHILE LIGHTERS ON EAST FLANK WAIT FOR A FEW MINUTES. SHORTLY AFTER LIGHTERS ON EAST FLANK START DOWN THE TWO TRACK WIND SHIFTS OUT OF THE WEST. 1335 PICK UP SPOTS ACROSS TWO TRACK E-1419 UNABLE TO CATCH SPOTS. 1345 FIRE SLOPS OVER CR 56 WITH NO SIGNS OF SLOWING DOWN. 1400 DECLARE BURN A WILDFIRE ADDITIONAL RESOURCES REQUESTED. FIRE CONTAINED @ 1900 9/29/10.

BURN BOSS SIGNATURE: [signature] FXBZ(T) [signature] (RXBZ)

DATE: 9/30/10

## F. TECHNICAL REVIEWER CHECKLIST

| PRESCRIBED FIRE PLAN ELEMENTS: | S /U | COMMENTS |
|---|---|---|
| 1. Signature page | S | |
| 2. GO/NO-GO Checklists | S | |
| 3. Complexity Analysis Summary | S | |
| 4. Description of the Prescribed Fire Area | S | |
| 5. Goals and Objectives | S | |
| 6. Funding | S | |
| 7. Prescription | S | |
| 8. Scheduling | S | |
| 9. Pre-burn Considerations | S | |
| 10. Briefing | S | |
| 11. Organization and Equipment | S | |
| 12. Communication | S | |
| 13. Public and Personnel Safety, Medical | S | |
| 14. Test Fire | S | |
| 15. Ignition Plan | S | |
| 16. Holding Plan | S | |
| 17. Contingency Plan | S | |
| 18. Wildfire Conversion | S | |
| 19. Smoke Management and Air Quality | S | |
| 20. Monitoring | S | |
| 21. Post-burn Activities | S | |
| Appendix A: Maps | S | |
| Appendix B: Complexity Analysis | S | |
| Appendix C: Risk Management Analysis | S | |
| Appendix D: Fire Prediction Modeling Runs | S | |
| Appendix E: Burn Boss Report | S | |
| Other | | |

S = Satisfactory U = Unsatisfactory

**Recommended for Approval:** **Not Recommended for Approval:**

| Lisa Bachmann | RXB2 | 9/8/10 |
|---|---|---|
| Technical Reviewer | Qualification and currency (Y/N) | Date |

☐ **Approval is recommended subject to the completion of all requirements listed in the comments section, or on the Prescribed Fire Plan.**

# Appendix C
# Dispatch Logs

**WildCAD Incident Card - Craig Interagency Dispatch Center: LSD 2010-497**
*"JACK SPRINGS RX" Prescribed Fire 08/17/2010 15:24:00 Order Number: CO-LSD-497*
Area B4LS (PONDEROSA PINE)

**Initial Report On Conditions:**
Jack Springs project area

**Initial Location:** Jack Springs
Lat: 40°,39',23.04", Lon: 108°,50',5.64", T8N, R102W, SWSW Sec 11
**Actual Location (09/27/2010 14:08):**
Lat: 40°,39',23.04", Lon: 108°,50',5.64", T8N, R102W, SWSW Sec 11

**Dispatcher:** Janell Neubauer **Status:** Open **Sub-Type:** Piles
**Web Comment:**
CO-LSD-497;
IQCS:179691

RX

| Resource | Commit | Respond | On Scene | Avail Inc | Returning | Off Incident |
|---|---|---|---|---|---|---|
| BPR E-1610 | 09/28 13:52 | 09/28 13:54 | | | | 09/28 14:04 |
| CRD E-1419 | 09/28 08:18 | 09/28 08:19 | 09/28 10:23 | | | 09/28 14:03 |
| CRD E-1611 | 09/15 09:53 | 09/15 09:53 | 09/15 12:02 | | 09/15 15:12 | 09/15 16:47 |
| CRD E-1613 | 09/28 08:18 | 09/28 08:19 | 09/28 11:22 | | | 09/28 14:04 |
| CRD E-1614 | 08/24 09:41 | 08/24 09:41 | 08/24 11:29 | | 08/24 15:21 | 08/24 17:09 |
| SQD 1-1 | 09/22 10:54 | 09/22 10:54 | | | | 09/22 12:39 |
| CH12 | 09/28 08:39 | 09/28 08:39 | 09/28 10:20 | | | 09/28 14:04 |
| DV11 | 09/28 08:31 | 09/28 08:31 | 09/28 10:23 | | | 09/28 14:04 |
| FM11 | 09/07 09:12 | 09/07 09:12 | 09/14 12:41 | | 09/14 15:04 | 09/15 09:53 |
| PORTELL C. | 09/28 08:37 | 09/28 08:37 | 09/28 10:22 | | | 09/28 14:04 |
| SC12 | 09/15 12:41 | 09/15 12:41 | 09/15 14:04 | | 09/15 15:13 | 09/15 16:47 |
| SCHAUS | 09/28 08:37 | 09/28 08:37 | 09/28 10:22 | | | 09/28 14:04 |
| THOMPSON | 09/28 08:34 | 09/28 08:34 | 09/28 10:22 | | | 09/28 14:05 |
| YEAGER | 09/28 08:32 | 09/28 08:32 | 09/28 10:23 | | | 09/28 14:05 |

| Entry Date/Time | From | To | Details |
|---|---|---|---|
| 08/17/2010 15:52:14 | 1613 | Gary | 8/10 @ 1127 - w/ Herley, Beckerman, Voetgle -> Jack Springs eta 1330 |
| 08/17/2010 15:52:46 | FM11 | Gary | 8/10 @ 1127 - -> Jack springs eta 1330 |
| 08/17/2010 15:53:53 | FM11 | Wendy | 8/10 @ 1329 - + 1613 @ Jack Springs |
| 08/17/2010 15:54:44 | Sqd1-1 | Wendy | 8/10 @ 1214 - w/ bloom, meyer, rummelhart, Gerard -> Jack springs eta 1410 |
| 08/17/2010 15:55:13 | Sqd 1-1 | Wendy | 8/10 @ 1350 Jack springs |
| 08/17/2010 15:57:55 | FM11 | Wendy | 8/10 @ 1535 - + 1613, Sqd1-1 -> Craig eta 1745 |
| 08/17/2010 15:58:31 | Sqd1-1 | Gary | 8/10 @ 1722 - in sta |
| 08/17/2010 15:58:53 | FM11 | Gary | 8/10 @ 1723 - in sta |
| 08/17/2010 15:59:09 | 1613 | Janel | 8/10 @ 1730 - in sta |
| 08/17/2010 16:00:51 | Sqd1-1 | Wendy | 8/11 @ 1009 - w/ bloom, meyer, gerard, rummelhart -> 1419, 1614 -> Jack springs eta 1145 |
| 08/17/2010 16:01:53 | 1419 | Wendy | 8/11 @ 1011 - w/ yeager, zimmerman, rydberg clark |
| 08/17/2010 16:02:25 | 1614 | Wendy | 8/11 - @ 1028 - w/ st. martin, green, gawura, skavdahl > Jack springs ETa 1230 |
| 08/17/2010 16:03:04 | Sqd1-1 | Janel | 8/11 @ 1226 - + 1614 @ Jack Springs |
| 08/17/2010 16:03:22 | 1419 | Janel | 8/11 @ 1235 - @ Jack Springs |
| 08/17/2010 16:04:06 | Sqd1-1 | Janel | 8/11 @ 1303 - radio ck on Zenobia, broken and unreadable, radio ops will Lookout |
| 08/17/2010 16:04:47 | Sqd1-1 | Janel | 8/11 @ 1514 - all NZ resources -> Craig eta 1730 |
| 08/17/2010 16:06:07 | Wendy | 1419 | 8/11 @ 1539 - hold in Maybell and extend to 1830 |
| 08/17/2010 16:06:27 | Wendy | 1614 | 8/11 @ 1541 - extent to 1830 and hold in maybell, relay to SQD1-1 |
| 08/17/2010 16:07:59 | 1419 | Wendy | 8/15 @ 0927 - yeager, zimmerman, rydberg, clark > Jacksprings ETA 1130 |
| 08/17/2010 16:08:29 | 1614 | Wendy | 8/15 @ 0928 - w/ st. martin, green, gawura, skavdahl same traffic at 1419 |

| Entry Date/Time | From | To | Details |
|---|---|---|---|
| 08/17/2010 16:09:35 | 1419 | Wendy | 8/15 @ 1138 - +1614 @ jack springs fuels project |
| 08/17/2010 16:10:18 | 1614 | Miles | 8/15 @ 1520 - +1419 --.> craig eta 1730 |
| 08/17/2010 16:11:03 | 1419 | Wendy | 8/15 @ 1720 - back in station |
| 08/17/2010 16:11:23 | 1614 | Wendy | 8/15 @ 1728 - in craig |
| 08/24/2010 09:41:20 | 1614 | Wendy | w/ green, gewara, skavdahl, st. martin > Jacks springs RX ETA 1150 |
| 08/24/2010 11:28:49 | 1614 | Wendy | arrived project |
| 08/24/2010 15:21:17 | 1614 | Wendy | > Craig ETA 1730 |
| 08/24/2010 17:09:15 | 1614 | Wendy | back in station |
| 09/07/2010 09:12:29 | FM11 | Wendy | > Jack springs eta 1045 |
| 09/14/2010 12:40:59 | FM11 | Wendy | at Jack springs |
| 09/14/2010 15:03:59 | FM11 | Wendy | > Craig ETA 1630 |
| 09/15/2010 09:52:37 | 1611 | Stacy | w/ Bloom, Gerard, Cook, --Jack Springs ETA 1150 |
| 09/15/2010 09:53:12 | 1614 | janell | / Green, Gawura, Meyer -> Jack Springs eta 1200 |
| 09/15/2010 12:04:04 | 1611 | Janell | send driver w/ Sqd vehicle for 1611 crew, will call back about tow truck |
| 09/15/2010 12:04:18 | 1611 | Janell | will need a tow truck on MFX 56 past 1st gate 7575 combo; will have 1614 come back down and p/u 1611 crew to take them to the project site |
| 09/15/2010 12:04:32 | FM11 | Janell | hold off on town truck, want to try and fix the eng themselves sounds like an altenator |
| 09/15/2010 12:41:04 | stacy | sqd 1-1 | 1400 eta for fm11 & sc2 |
| 09/15/2010 15:12:25 | 1611 | Janel | all resources -> Craig eta 1730, Paul Cook will be on 1614 for return |
| 09/15/2010 15:13:12 | FM11 | Janel | @ 1404 + SC12 tied in w/ 1611 @ Jack Springs |
| 09/15/2010 16:47:12 | 1611 | Janel | + 1614 IN STA |
| 09/15/2010 16:47:25 | SC2 | Janel | IN STA |
| 09/15/2010 16:47:41 | FM11 | Janel | IN STA |
| 09/16/2010 09:50:08 | 1611 | Janell | w/ Bloom, Gerard, Meyer -> Jack springs eta 1150 |
| 09/16/2010 09:50:40 | 1614 | Gary | @ 0934 > Jack Springs w/St Martin Green Skaudahl Gawura eta 1145 |
| 09/16/2010 11:24:02 | 1614 | Janel | @ Jack Springs |
| 09/16/2010 11:32:26 | 1611 | Janel | @ jack springs |
| 09/16/2010 14:54:13 | 1611 | Janel | + 1614 -> Craig eta 1700 |
| 09/16/2010 16:38:43 | 1614 | Janel | in sta |
| 09/16/2010 16:46:42 | 1611 | Janel | in sta |
| 09/20/2010 13:42:51 | FM11 | Alex | (1146) --> jack springs eta 1315 |
| 09/20/2010 13:43:10 | FM11 | Alex | (1318) arrived jack springs |
| 09/20/2010 15:19:38 | FM11 | Wendy | > Craig ETA 1645 |
| 09/22/2010 10:54:43 | sqd 1 | Stacy | e/ Meyer & Gerard --> Big Pondo to meet 1610 ETA 1300 |
| 09/28/2010 08:18:42 | 1613 | Wendy | w/herley, beckerman 1614 w/ green meyer 1419 zimmerman howerton > Jack Springs RX ETA 1100 |
| 09/28/2010 08:30:45 | Craig A | Wendy | Thompson, Schuase and Portell > jack springs RX ETE 2hours |
| 09/28/2010 08:30:53 | yeager | Wendy | +DV11 > jack spirngs ETA 1030 |
| 09/28/2010 08:37:51 | Janel | CSP | Joan - notified |
| 09/28/2010 08:39:26 | FM11 | Wendy | +CH12 > JAck springs ETA 1000 |
| 09/28/2010 08:40:44 | Janel | BPR | Chris - notified |
| 09/28/2010 09:04:10 | Janel | Roundtop | notified |
| 09/28/2010 09:43:42 | Janel | MFX11 | notified |
| 09/28/2010 10:08:33 | 1614 | Wendy | at RX |
| 09/28/2010 10:20:21 | FM11 | Wendy | +CH12 at RX |
| 09/28/2010 10:22:29 | Craig A | Wendy | on scene |
| 09/28/2010 10:30:17 | green | Stacy | request spot wx, obs given |
| 09/28/2010 10:34:02 | Wendy | Green | RH? 22 |
| 09/28/2010 10:36:06 | stacy | NWS< GJ | Mike, spot submitted, returned in about 30-40 mins. |
| 09/28/2010 11:19:42 | Wendy | all | read wx |
| 09/28/2010 11:45:13 | Wendy | RX | read spot forecast, get back in little bit |
| 09/28/2010 12:05:00 | RX | Wendy | going through go/no go, good with test fire on SW corner |
| 09/28/2010 12:36:44 | RX | Wendy | test burn went good, take fire up both flanks working to the North. Stay on Lookout for now. |

| Entry Date/Time | From | To | Details |
|---|---|---|---|
| 09/28/2010 13:36:02 | RX | Wendy | p/u couple spots on east side of burn and request E1610 at this time. |
| 09/28/2010 13:40:52 | Janel | Ashcraft | being requested to respond to Jack Springs Rx, will call when -> |
| 09/28/2010 13:44:32 | UBC | Janel | Cheryl - been receiving smoke report over by Blue Mtn and Jones Hole, relayed legal for Rx |
| 09/28/2010 13:53:36 | 1610 | val | --> jack springs ete 45 mins |
| 09/28/2010 13:54:10 | Wendy | RX | relay E1610 ETE 45mins |
| 09/28/2010 13:56:40 | janette | Stacy | @ csp dustin haggerty rp smike over gates of ladore area-jack springs rx? yes |
| 09/28/2010 13:59:59 | RX | Wendy | update, had good wind shift out of west, slop over cty Rd 56 pushing to the east. Looking at 15ac east of Cty Rd56. Declare as wildfire. Yeager will be IC for now. Order MFX engine and two seats. where slop did burn under powerlines to residence please contact. Get back to them with ETA. Ground contact? Beckerman |
| 09/28/2010 14:03:35 | val | ubc | notified cheryl that rx is now a wildlife |
| 09/28/2010 14:11:40 | CH 11 | Blackstun | Briefed Dave on the escape declaration on the fire. |
| 09/28/2010 14:13:06 | CH 11 | K. Cowan | Left voice mail on both of Kyle's phones about the escape of the burn. |
| 09/28/2010 14:18:50 | CH 11 | K Kerr | Left voice mail for Ken concerning escape Rx. |

| VOR | ATB | Helibase |
|---|---|---|
| 34m 046° VEL: VERNAL | 34m 339° 4V0: RANGELY AIR | 90m 262° SBS: STEAMBOAT S |
| 55m 295° EKR: MEEKER | 57m 297° EEO: MEEKER AIRP | 93m 338° GJT: WALKER FIEL |
| 70m 263° CHE: HAYDEN | 61m 266° CAG: CRAIG | |
| 85m 311° RIL: RIFLE VOR | 74m 265° HDN: HAYDEN | |
| 96m 344° JNC: GRAND JUNCT | 93m 338° GJT: WALKER FIEL | |

**WildCAD Incident Card - Craig Interagency Dispatch Center: LSD 2010-651**
*"JACK SPRINGS" Wildfire 09/28/2010 13:59:00 Order Number: CO-LSD-651*
Area B4LS (PONDEROSA PINE)

**Reporting Party:** Jack Springs RX - Yeager

**Initial Report On Conditions:**
Jacks Springs RX Declared a Wildfire

**Initial Location:** Jack springs
Lat: 40°,39',25.21", Lon: 108°,50',4.93", T8N, R102W, SWSW Sec 11
**Actual Location (09/28/2010 14:36):** Jack Springs
Lat: 40°,39',25.21", Lon: 108°,50',4.93", T8N, R102W, SWSW Sec 11

**Dispatcher:** Janell Neubauer **Status:** Open **Sub-Type:** (5) Incendiary
**LSD Acres:** 100 **COUNTY:** MFX
**Job Codes:** FV71
**Web Comment:**
CO-LSD-651
**Incident Commander(s):**
09/28/2010 1437 Bryan Yeager Effective 9/28/2010 @ 1359

WF

| Resource | Commit | Respond | On Scene | Avail Inc | Returning | Off Incident |
|---|---|---|---|---|---|---|
| BPR E-1610 | 09/28 14:04 | 09/28 14:05 | 09/28 14:40 | | | 09/28 22:46 |
| CRD E-1419 | 09/28 14:03 | | 09/28 14:05 | | | |
| CRD E-1613 | 09/28 14:04 | | 09/28 14:05 | | | |
| CRD E-1614 | 09/28 14:04 | | 09/28 14:05 | | | |
| MFX E-326 | 09/28 16:04 | 09/28 16:04 | 09/28 17:31 | | | 09/28 22:46 |
| MFX E-421 | 09/28 14:47 | 09/28 15:11 | 09/28 16:08 | | | 09/28 22:46 |
| MFX E-426 | 09/29 09:43 | 09/29 09:43 | | | | |
| MFX E-624 | 09/28 14:47 | 09/28 15:03 | | | | 09/28 15:17 |
| CH12 | 09/28 14:04 | | 09/28 14:05 | | | 09/28 22:46 |
| DV11 | 09/28 14:04 | | 09/28 14:05 | | | |
| FM11 | 09/28 14:04 | | 09/28 14:05 | | | |
| MFX 11 | 09/28 14:23 | 09/28 14:23 | 09/28 15:20 | | | |
| PORTELL C. | 09/28 14:04 | | 09/28 14:05 | | | 09/29 07:08 |
| SCHAUS | 09/28 14:04 | | 09/28 14:05 | | | 09/29 07:08 |
| THOMPSON | 09/28 14:05 | | 09/28 14:05 | | | 09/29 07:08 |
| YEAGER | 09/28 14:05 | | 09/28 14:05 | | | |
| KOOTENAI 3 | 09/28 14:23 | 09/28 14:23 | 09/29 07:54 | | | |
| ROGUE RIV | 09/28 14:22 | 09/28 14:23 | 09/28 19:11 | | | |
| AA-55 | 09/28 14:44 | 09/28 14:44 | 09/28 14:57 | | 09/28 18:53 | 09/28 19:23 |
| T-11 | 09/28 14:45 | 09/28 15:22 | 09/28 15:45 | | | 09/28 17:41 |
| T-25 | 09/28 14:45 | 09/28 15:22 | 09/28 15:45 | | | 09/28 18:28 |
| T-878 | 09/28 14:45 | 09/28 14:57 | 09/28 15:45 | | 09/28 18:32 | 09/28 19:17 |
| T-880 | 09/28 14:44 | 09/28 14:57 | 09/28 15:09 | | | 09/28 17:45 |
| HT-715 | 09/28 14:45 | 09/28 15:11 | 09/28 15:58 | | 09/28 19:03 | 09/28 19:24 |
| B-61/LP 67 | 09/28 16:15 | | 09/28 16:16 | | 09/28 18:32 | 09/28 19:06 |

| Entry Date/Time | From | To | Details |
|---|---|---|---|
| 09/28/2010 14:00:20 | JackSpriRX | Wendy | update, had good wind shift out of west, slop over Cty Rd 56 pushing to the east. Looking at 15ac east of Cty Rd 56. Declare as wildfire. Yeager will be IC for now. Order MFX engine and two seats. where slop did burn under powerlines to residence please contact. Get back to them with ETA. Ground contact? Beckerman |
| 09/28/2010 14:00:26 | stacy | mfx 11 | requesting mfx engine, will be E-421 out of maybell no eta. MFX 11 will also responding after finishes a call. |
| 09/28/2010 14:03:59 | val | ubc | notified cheryl that rx is now a wildlfire |
| 09/28/2010 14:04:22 | stacy | traci | @ yvea dispatch, advised fire burned under powerlines, cr 56 is moon lake not yvead |

| Entry Date/Time | From | To | Details |
|---|---|---|---|
| 09/28/2010 14:05:42 | Janel | gjc | AMy - faxed order for SEAT and AA |
| 09/28/2010 14:09:44 | stacy | Tony | w/ Moon Lake Electric, advised of powerlines burned under, not sure if it has burned any poles. will let him know. can they come look at it tommorrow or need today. 435-790-7605 cell |
| 09/28/2010 14:11:13 | Wendy | IC | Moon Lake Electric has been advised, immediate need? need them to shut the power off. advised that there is a breaker and may possibly trip |
| 09/28/2010 14:13:48 | stacy | Tony | w/ Moon Lake, can we deengergize that line if not tripped, 4 hours away for person to get there. |
| 09/28/2010 14:15:42 | IC | Wendy | UPDATE over 60 ac on slop, active at head of slop, if T1 crews avail order 2. 2 Heavies in GJC and HT in SBS. Avail to dip with HT? North of park. 4 hours to de-energize. |
| 09/28/2010 14:16:41 | Janel | A.Tucker | will be av to reload SEATS out of CAG until SEMG comes up from GJT |
| 09/28/2010 14:17:05 | IC | Wendy | also order HT |
| 09/28/2010 14:17:49 | val | kootenai | head back to vehicles and call dispatch for directions ete 1 hr and 30 mins for cell coverage |
| 09/28/2010 14:21:05 | stacy | duerksen | advised ordering Kootenia and Rogue River, can you advise district folks |
| 09/28/2010 14:21:14 | val | rogue rive | please head back to vehicles and call dispatch land line for further directions. Ete 15 mins to vehicles and 10 more for cell coverage |
| 09/28/2010 14:22:02 | mfx 11 | Stacy | crewmmembers (Uecker & Duncan) eta maybell ETA 1500 get E-421, MFX 11 ETA 1600 to fire |
| 09/28/2010 14:23:00 | Wendy | IC | LZ for HT and need Heavy Tankers?? Will get back to you on those in bit |
| 09/28/2010 14:29:37 | stacy | Lynn | contact pvt landowners |
| 09/28/2010 14:31:12 | IC | Wendy | Have HT get LZ off of cty rd 10 and 12 best spot. Status of SEATs? Place order for both heavies. Dip site can checking ponds but most likely river. A/G N Primary. Update 100ac fairly active working south flank of slop good progress but palying catch up. Relay resources coming, Rogue river, Kootenai, HT 715, Maybell Engine, MFX 11 |
| 09/28/2010 14:34:44 | rogue rive | val | needed dispatch number |
| 09/28/2010 14:35:41 | Janel | HT-715 | Doug - order placed, |
| 09/28/2010 14:37:02 | Janel | GJC | Amy - order sent for Heavy tankers |
| 09/28/2010 14:37:12 | Janel | FTC | John - order placed for LEAD' |
| 09/28/2010 14:37:45 | CH 11 | K Cowan | Left voice mail for Kyle on resources ordered for fire. |
| 09/28/2010 14:38:54 | sandy, | Stacy | dave gruys in rifle is available for SEMG and would be closer, if want to place an order. Sandy will talk to state SEAT manager again. |
| 09/28/2010 14:40:37 | ic | stacy | e 1610 on scene, |
| 09/28/2010 14:42:57 | CH 11 | K Kerr | Updated Ken on resources ordered and est. size of slop over. They are working on contacting Boise for requirements, etc. of review process. |
| 09/28/2010 14:43:31 | Wendy | IC | AA-55 23mins |
| 09/28/2010 14:45:11 | doug | Stacy | putting fuel truck at CAG, until know what LZ is like for huge fuel trcuk |
| 09/28/2010 14:47:42 | MFX11 | Wendy | Rolling MFX E624 w/anthony when arrive will jump on board with him ETA 1630 |
| 09/28/2010 14:48:30 | Dickinson | Desa | T Wright Dickinson called and Mark is on Cold Springs and can see smoke in Browns Park. I informed him of the wildfire/rx and he said that was probably it. |
| 09/28/2010 14:49:12 | John FCD | Desa | Let Jannelle know that Tanker 878 is off at 1438, 1 hour 10 mins in route |
| 09/28/2010 14:55:31 | MFX11 | Wendy | check with IC if need Tender? |
| 09/28/2010 14:55:40 | tucker | Stacy | adam, turned radio on now 123.975- he is ready to load seats |
| 09/28/2010 14:57:07 | Gloria RM | Desa | called to let us know there was a fire reported. Off Vernal VOR - 060 @032 miles - it is Jack Springs |
| 09/28/2010 14:57:47 | Wendy | IC | no contact |
| 09/28/2010 15:00:05 | CH 11 | ALL | Dave Blackstun and I called Jamie Connell to fill her in on escape and update with resources on-scene and ordered, est. fire size, etc. |

| Entry Date/Time | From | To | Details |
|---|---|---|---|
| 09/28/2010 15:00:20 | IC | Wendy | Tender? Neg at this time, in contact with AA-55 at this time. How many engines from MFX? Two |
| 09/28/2010 15:00:57 | Wendy | MFX11 | Copied direct on Tender |
| 09/28/2010 15:03:27 | MFX 624 | Wendy | Craig > fire ETA 70mins |
| 09/28/2010 15:05:25 | tim, gjc | Stacy | semg order add pov, laptop & cell phone authorize, Dave's eta to craig is 1730 and will do his ad paperwork in Craig, instead of going to GJ first |
| 09/28/2010 15:06:14 | MFX421 | Wendy | > fire ETA 30mins |
| 09/28/2010 15:14:15 | Nelson | Janel | will not be able to hot load the SEATS due to lack of SEMG on site at CAG, until ordered SEMG is in place |
| 09/28/2010 15:17:25 | MFX624 | Wendy | HWY 40 at MP 75 with mechanical issues and will have to call maint person. He will call. |
| 09/28/2010 15:17:29 | CH 11 | T Toelle | Called Toni to tell her I probably wouldn't be available tomorrow. Moab helicopter is not currently being requested for the fire, so it may still be available to her. May need to talk about dispatch capability for her Rx tomorrow....will decide on that later today. |
| 09/28/2010 15:17:32 | Wendy | MFX11 | copied direct |
| 09/28/2010 15:18:35 | GJ | Desa | T11 - 25 mins out, T25 - 20 mins out....relayed information to Janell |
| 09/28/2010 15:20:51 | MFX11 | Wendy | did copy traffic with E624 working on getting another engine to come out. Show him in area of jack springs |
| 09/28/2010 15:26:55 | FCD | Desa | Wanted to know if Janell is in contact with B61 - yes she is |
| 09/28/2010 15:30:23 | Wendy | all | read zone 201 wx |
| 09/28/2010 15:38:01 | HT-715 | Janel | Doug - moving fuel truck to CAG, will have helo for F/R in CAG |
| 09/28/2010 15:41:35 | Kooteni | Stacy | 15 miles outside of walden, had to return to walden to drop off a vehicle first, then to Craig ETA 1900. Day 5 today. |
| 09/28/2010 15:42:48 | rogue riv | Val | --> Craig ete 1 hr. |
| 09/28/2010 15:47:34 | Wendy | IC | Update: couple heavies working flnks, acitivty p/u again push from north, still around 100ac or less long skinny finger on slop. good progress but still open on north. Do you have contact with AA? yes Crew ETA's 17/1900 |
| 09/28/2010 15:49:39 | IC | Wendy | update power company on north flank have one powerline down on ground. |
| 09/28/2010 15:51:09 | GJC | Janel | Heather - can talk directly w/ T-25 and T-11, have them LAC, can also hear AA-55 LAC when they are L/R |
| 09/28/2010 15:52:15 | stacy | tony | w/ Moon Lake advised of down line, +30 for techs will turn off line then give a visual. Have them call us to get in touch w/ ic. |
| 09/28/2010 15:54:43 | Wendy | IC | power comany 30mins cty rd 56 through first gate tie in with IC or MFX 11 well away from fire. |
| 09/28/2010 15:58:45 | GJD | Desa | Amy - wanted number of PIO - gave her Lynn's number to give to the public when they call for information |
| 09/28/2010 16:00:35 | Janel | FTC | John - order heavy A/T per ops; p/u new start will ck w/ AA to see if they will let T-00 go |
| 09/28/2010 16:01:01 | CH 11 | k kerr | Updated info on fire size, resources, progress on fire, etc. Wondered how things were going and I told him sounded pretty good. |
| 09/28/2010 16:03:06 | Janel | RWC | Mike - notified |
| 09/28/2010 16:03:38 | MFX326 | Wendy | > fire 2hours |
| 09/28/2010 16:04:03 | Janel | FTC | Irene - will be a little bit if T-00 is assigned, while AA takes a look a new start |
| 09/28/2010 16:06:16 | Janel | RMC | Debbie - ck av of closest T1 or 2 tanker besides T-00 |
| 09/28/2010 16:06:40 | Janel | RMC | advised per AA-55 will be on D/O 9/29-9/30, maybe look at ordering addt'l LEAD |
| 09/28/2010 16:06:45 | Debbie, rm | Stacy | closest out of area AT @ Hill AFB (SLC), Pocotello, Cedar City all P2Vs |
| 09/28/2010 16:07:37 | Wendy | IC | MFX 326 ETA 1800 is replacing E624 and has MFX 421 arrived? haven't seen 421 yet. ?HT-715? In contact with AA-55 |
| 09/28/2010 16:08:24 | FCD | Desa | Irene - Janell ordered a tanker from FC but they have a fire too and can't send it |
| 09/28/2010 16:08:29 | MFX421 | Wendy | about 5mins out just crossed gates, will show on scene |

| Entry Date/Time | From | To | Details |
|---|---|---|---|
| 09/28/2010 16:20:45 | Heather | Desa | A55 is a Rocky Mountain resource, need to place order up to them - I relayed this info to Janell |
| 09/28/2010 16:35:35 | ic | stacy | lat/long from AA for water source 40, 35 X108, 49 SE of burn on douglas mtn |
| 09/28/2010 16:38:08 | stacy | ic | water source is on walkers property. tie in w/ MFX 11 and see if he can make contact w/ landowner |
| 09/28/2010 17:04:05 | Wendy | IC | when get chance call dispatch with plans for tonight and a few other logistical items. Will call in a little bit |
| 09/28/2010 17:05:11 | DEBBIE, RM | stacy | no word on tanker eta, still on ground , lead is going to GJ |
| 09/28/2010 17:06:56 | Janel | GJC | Heather - advised of addt'l LEAD ordered, and 3 A/T ordered; already in contact w/ RMC |
| 09/28/2010 17:07:47 | Deetz | Wendy | Tony looking for their personnel. Will get back to him currently on phone with IC and will check. |
| 09/28/2010 17:17:34 | ic | Stacy | Update, Moon Lake elec on scene and left already. they have some repairs that need made once fire is controlled. will need to call them when ok to return. will be staffing 24 hours, Rogue river in Craig briefing ETA to fire 1930-2000. 3rd a/t out of slc, not sure will make it to fire tonight or just GJ. MFX 11 is still trying to make contact w/ walkers, look in bmans desk for # for Dawn. Helo is dipping out of thatpond, suggest Kooteni to Maybell or closer to fire tonight |
| 09/28/2010 17:20:47 | MFX11 | Wendy | tried to contact Wanda, left message on daughters cell phone 269-7003 Don knottingham Wanda's 269-7030. Pond near Chicken springs. |
| 09/28/2010 17:23:16 | Moon Lake | Desa | Tony Deets called to let us know that the powerline near the fire is open and dead (turned off). They have a visual opening to show that is it off. |
| 09/28/2010 17:27:26 | Moon lake | Stacy | Tony Deets advised him elec repairmain tied in w/ fire, have left the scene. will need to come back to make repairs when fire controlle, we will call moon lake |
| 09/28/2010 17:27:44 | debbie, rm | Stacy | t-10 off shortly, no fq on resource order |
| 09/28/2010 17:31:25 | mfxz 326 | Wendy | will be on scene and already in contact with MFX 11 and will also contact IC |
| 09/28/2010 17:36:49 | Wendy | IC | any need for Tankers to be kept on passed 1900? Rogue River ETA 1930/2000. No need to keep past 1900 for tankers |
| 09/28/2010 17:38:29 | katie, rwc | Stacy | need for smkj or hel3 past 1800? no |
| 09/28/2010 17:41:36 | CH 11 | K Kerr | Updated Ken and Gwenan on fire situation. They have initial plans for review team stuff, delegation, etc. Probably Gwenan and Kyle Cowan will come to Craig tomorrow to work with us. |
| 09/28/2010 17:42:17 | CH 11 | D Blackstu | Updated Dave on fire status and State Office plans for tomorrow. |
| 09/28/2010 17:59:09 | Janel | RMC | Debbie - c/x T-10; won't be able to make it due to mechanical |
| 09/28/2010 17:59:37 | Janel | GJC | Heather - advised of c/x T-10 |
| 09/28/2010 18:02:18 | RMC | Janel | Debbie - there is not a need for SEMG that was ordered thru GJC, for any prepo or severity orders |
| 09/28/2010 18:03:21 | Janel | CH11 | needs for a SEMG? negative |
| 09/28/2010 18:12:41 | IC | Wendy | update: looking better with smome shade, activity down, open line quite a bit, wx obs |
| 09/28/2010 18:20:01 | Wendy | GJNWS | Norm, submitted spot request. Will try to get it back shortly |
| 09/28/2010 18:27:04 | IC | Wendy | update: no needs for airtankers for tomorrow continue to use helo for little while longer tonight. |
| 09/28/2010 18:31:54 | Janel | FTC | John - advised of B-61 and T-878 +50 -> BJC and FNL; advised of pumpkin time for BJC for T-878, he should be able to make pumpkin @ 1836 |
| 09/28/2010 18:44:49 | Wendy | IC | have spot forecast. Will get back for it |
| 09/28/2010 18:48:51 | A. Tucker | Janel | will be av by cell 9/29 |
| 09/28/2010 18:55:00 | Janel | GJC | Heather - advised of AA-55 +26 -> GJT |
| 09/28/2010 19:11:12 | Wendy | IC | What time do you need the Helo over fire tomorrow? Do not need helo for tomorrow. Rogue river made contact on Tac so on scene |
| 09/28/2010 19:12:05 | Janel | Colaprete | per IC no needs for Helo 2morrow; will park the helo at CAG tonite and will reposition in SBS 2morrow, will advise when that takes place |

| Entry Date/Time | From | To | Details |
|---|---|---|---|
| 09/28/2010 19:13:48 | Rogue Riv | Wendy | on fire and contact with IC |
| 09/28/2010 19:27:32 | Telford | Wendy | checking in saw new fire. Let know about resources staying out and gave brief update on fire. Will be taking A/L tomorrow again unless he is needed, but can call him if needed. |
| 09/28/2010 19:28:13 | CH 11 | K Kerr | Gave Ken one last update for the evening. Will call again tomorrow morning if anything changes between now and then. |
| 09/28/2010 20:02:31 | IC | Desa | update - probably release two mx eng by 2100, along with 3 craig hotshots, most everyone else will be staying and will work until 2200, will let us know when resources leave the fire. And will call when at camp for the night. Fire is looking pretty good. |
| 09/28/2010 20:45:22 | IHC Alpha | Desa | Leaving Jack Springs Fire, enroute to Craig (3 hotshots) eta---> 2246 |
| 09/28/2010 21:10:59 | Chief 1-2 | Emily | leaving fire, riding with Craig Alpha - ETA Craig 2245. |
| 09/28/2010 21:15:15 | E1610 | Emily | leaving fire, en route to Browns Park ETA 2215. |
| 09/28/2010 21:18:28 | JS Ops | Emily | MFX 421 & 326 are en route to Maybell ETA 2230. |
| 09/28/2010 21:20:48 | MFX 11 | Emily | en route to Maybell w/ other MFX resources to Maybell, ETA 2230. |
| 09/28/2010 21:38:23 | Kootenai | Emily | in Maybell and setting up camp. |
| 09/28/2010 22:22:44 | IC | Emily | all resources off the line, camping at 40 38 32 x 108 50 07 |
| 09/28/2010 22:23:17 | MFX | Emily | all MFX resources called and are in Maybell for the night |
| 09/28/2010 22:24:22 | Chief 12 | Emily | back in station |
| 09/28/2010 22:26:16 | E1610 | Emily | back in station |
| 09/28/2010 22:30:34 | Craig Alph | Emily | in station |
| 09/29/2010 06:36:41 | Emily | Wendy | Emily said no one had left to p/u up lunches yet, not sure if just forgot to call. Called to see where Neely was? She was never asked to p/u or drive anywhere last night. Asked if she could still come in? In about 0700. |
| 09/29/2010 06:37:11 | Wendy | City Marke | Nesa; Called to double check on lunches. No one had come in to p/u. Let know that we would have someone in at 0700ish to p/u. |
| 09/29/2010 06:53:16 | Neely | Wendy | Stopped in for directions...Will be about 2 hours |
| 09/29/2010 07:08:08 | 1610 | Wendy | i/s, ashcraft, smart, rumelhart > jack springs ETA? no answer |
| 09/29/2010 07:54:18 | Janel | Doug | returning phone call; cking status of moving HT715 back to SBS from CAG |
| 09/29/2010 07:54:55 | Wendy | IC | HT-715 had to stay in CAG last night but wondering on need today? keep til 1200 Kootenai? Kootenai on scene. Everyone briefed and on line. |
| 09/29/2010 07:58:35 | 1610 | Wendy | on scene |
| 09/29/2010 07:59:38 | mfx11 | Stacy | could send out engine w/ foreman for water shuttle eta 1100ish. |
| 09/29/2010 08:03:01 | Wendy | IC | Can you give Neeley yesterdays wx obs to bring back. Also MFX sending engine with forman to shuttle water. |
| 09/29/2010 08:04:14 | stacy | mfx11 | ic ok with time on mfx engine, probably 426 |
| 09/29/2010 08:28:14 | Brooks | Wendy | Let know that Yampa Valley Electric called him and told him that the Maybell area will be having a power outage around 0830 for about 3 hours. There shouldn't be an effect to us in Craig but if it happens then let him know. The Juniper radio site should be okay it has back up power. |
| 09/29/2010 08:30:32 | Neeley | IC | working way into drop point |
| 09/29/2010 08:43:08 | Wendy | IC | could we get any CTR's that you may have? Will try to get some together and send back with Neeley when she takes off. |
| 09/29/2010 09:06:17 | Neeley | Wendy | > Craig ETA 2 hours |
| 09/29/2010 09:43:17 | MFX426 | Wendy | > fire ETA 1100 |
| 09/29/2010 10:05:44 | IC | Janel | Yeager is IC, Beckerman is Ops, South and East of MFX 56 is Div B w/ Jeremy Delack and two handcrews, North and West is Div A w/ St Martin, Eng 1613, 1419, and 1610, everything is looking good, isolated torching interior, do not anticipate anymore resource needs at this time |
| 09/29/2010 10:11:10 | IC | Janel | meal order for dinners @ 2000, bfasts and lunches @ 0800, 15 cubies, 8 CS of MRE's deliver w/ dinner, need 4 CS of batteries, will call in about 20 min w/ acerage update, est containment @ 1900 |

| Entry Date/Time | From | To | Details |
|---|---|---|---|
| 09/29/2010 10:40:27 | Wintemute | Wendy | Will order 65 meals from brother's for tonight and Maybell for breakfast. Will have Reneta drive tonight p/u meals around 1630 so can be out to fire before gets too dark. Will see if Neeley will drive tomorrow morning. |

| VOR | ATB | Helibase |
|---|---|---|
| 34m 046° VEL: VERNAL | 34m 339° 4V0: RANGELY AIR | 90m 262° SBS: STEAMBOAT S |
| 55m 295° EKR: MEEKER | 57m 297° EEO: MEEKER AIRP | 93m 338° GJT: WALKER FIEL |
| 70m 263° CHE: HAYDEN | 61m 266° CAG: CRAIG | |
| 85m 311° RIL: RIFLE VOR | 74m 265° HDN: HAYDEN | |
| 96m 344° JNC: GRAND JUNCT | 93m 338° GJT: WALKER FIEL | |

**Initial Report On Conditions**

**Fuels:** **Acres:** 15 **W Speed:** **Dir:** **Slope:** **Aspect:**
**Spread:** **Complexity:** **Jurisdiction:** BLM
**Structures:** Cty Rd 56 Powerlines and the residence they go to

**Fire Report Information**

**Fire #:** **SubUnit:** **SubUnit #:**
**Acres:** 0 **Size Class:** **Elevation:** 0 **Land Status:**
**Contain:** **Control:** **Out:**

# Appendix D
# Maps and Photos

Fire Activity on West Flank

Firing Operation on West Flank

Fire Behavior on West Flank, Looking North, Prior to “Wind Shift”

Fire Moving East From West Flank Inside Target Area


**Jack Springs II Prescribed Burn and Wild Fire**
**222 acres Total**
**76 Acres In Project Area**
**146 Acres Outside Project Area**

1:24,000