

**Date of Report: 8/23/2019****Interim #1 Report Date: 9/21/2019****BURNED-AREA REPORT****PART I - TYPE OF REQUEST****A. Type of Report**

- ☒ 1. Funding request for estimated emergency stabilization funds
- ☐ 2. No Treatment Recommendation

**B. Type of Action**

- ☐ 1. Initial Request (Best estimate of funds needed to complete eligible stabilization measures)
- ☒ 2. Interim Request #1 FY20 Pilot Minor Facilities/Infrastructure Replacement/Repair
- ☐ Updating the initial funding request based on more accurate site data or design analysis

**PART II - BURNED-AREA DESCRIPTION****A. Fire Name: 163 HK Complex****B. Fire Number: OR-UMF-019163****C. State: OR****D. County: Morrow County****E. Region: R6****F. Forest: Umatilla****G. District: Heppner Ranger District****H. Fire Incident Job Code: P6MK2K19****I. Date Fire Started: 8/5/2019****J. Date Fire Contained: Estimated date of 8/31/2019****K. Suppression Cost: 5.5 million****L. Fire Suppression Damages Repaired with Suppression Funds (estimates):**

1. Fireline repaired (miles): 55 miles of dozer-line to be repaired
2. Other (identify):

**M. Watershed Numbers:***Table 1: Acres Burned by Watershed*

HUC #	Watershed Name	Total Acres	Acres Burned	% of Watershed Burned
170702020801	Swale Creek	13147	2044	16%
170702020803	Skookum Creek-Little Wall Creek	25693	661	3%

**N. Total Acres Burned:***Table 2: Total Acres Burned by Ownership*

OWNERSHIP	ACRES
NFS	2705
OTHER FEDERAL	0
STATE	0
PRIVATE	0
TOTAL	2705

- O. **Vegetation Types:** Late-seral stands are dominated by ponderosa pine, grand fir, or Douglas-fir as the climax species. Elk sedge and pinegrass are ubiquitous graminoids, while birchleaf spiraea, snowberry, ninebark, and bitterbrush are common shrubs. On the very driest sites, mountain-mahogany, big sagebrush, bluebunch wheatgrass, and western juniper are common.
- P. **Dominant Soils:** Loamy-skeletal, Lithic Haploxerolls, Loamy-skeletal, Vitrandic Argixerolls, Coarse-loamy, Vitrandic Haploxerepts, Ashy over loamy-skeletal, Alfic Udivitrands. Erosion of ashy deposits from convex areas to concave areas result in a mosaic of cobbly very shallow and shallow soils to very deep ashy over clayey skeletal or loamy skeletal soils. Most of the fire occurred on broad undulating basalt plateau summits or short steeply sloping backslopes. Most soils in map units of the fire area are very deep (>200 cm to bedrock or abrupt textural change).
- Q. **Geologic Types:** Soils formed in volcanic ash and loess over deeply incised basalt flows.

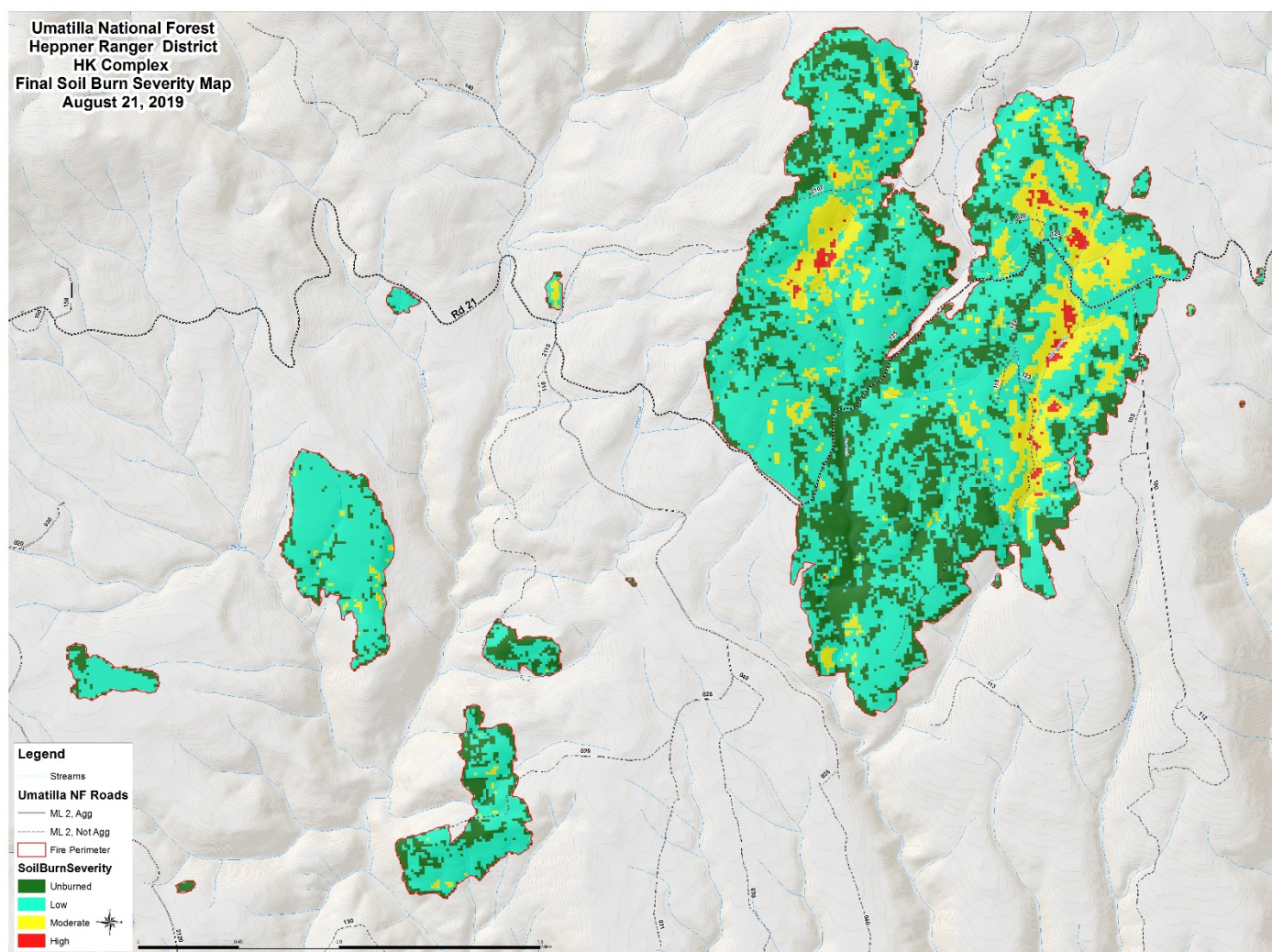
**R. Miles of Stream Channels by Order or Class:***Table 3: Miles of Stream Channels by Order or Class*

STREAM TYPE	MILES OF STREAM
PERENNIAL	3.6
INTERMITTENT	14.5
EPHEMERAL	

**S. Transportation System:**

**Trails:** *National Forest (miles):* 2.98

**Roads:** *National Forest (miles):* 15.05

**PART III - WATERSHED CONDITION****A. Burn Severity (acres):***Table 4: Burn Severity Acres by Ownership*

Soil Burn Severity	NFS	Other Federal (List Agency)	State	Private	Total	% within the Fire Perimeter
Unburned	735				735	27%
Low	1605				1605	59%
Moderate	339				339	13%
High	26				26	1%
<b>Total</b>	<b>2705</b>				<b>2705</b>	

**B. Water-Repellent Soil (acres): 35 acres****C. Soil Erosion Hazard Rating:** High 20 acres, Moderate 400 acres, Low 2,285 acres**D. Erosion Potential:** 0.09 tons/acre/year **Sediment Potential:** 0.06 tons/acre/year

**F. Estimated Vegetative Recovery Period (years):** 2-5 years on high soil burn severity

**G. Estimated Hydrologic Response (brief description):**

#### **Precipitation and runoff patterns**

Precipitation patterns within the fire area are characterized by summer convective storms, fall and winter frontal systems, and winter snows. Average annual precipitation is approximately 20 inches of which most falls between the months of October and June. Due to the average elevation of the fire area, the most likely runoff pattern associated with significant peak flows will result from late winter/early spring snowmelt. Other potential peak flows that may occur are associated with late fall/early winter frontal systems especially if warm marine intrusions follow heavy snows.

Post-fire peak flow was modeled using a storm event with a 5 year return interval. While peak flow modeling showed significant increases in peak flows within the fire boundary, soil burn severity field validation and monitoring indicated that reductions in infiltration due to soil hydrophobicity was very limited. This seems to suggest that while increases in peak flows may be expected during the fire recovery period (for convective rain storms), significant increases over the natural range of variability are less likely. Additionally, since peak flows within the fire area are associated most frequently with snowmelt or rain on snow events, any reductions in soil infiltration capacity would not meaningfully influence flood outcomes.

#### **Water quality**

Stream water temperature is not expected to increase as a result of the fire. This is primarily due to the fact the vast majority of streams within the fire area are intermittent/dry streams that flow only in the cool seasons.

#### **Sediment**

Sediment in the form of ash and single grain (very fine sands and silts) is expected to move through the stream network during the first year, especially during the early fall/winter rains. Some surface erosion resulting from overland flow is also expected to transport sediment to the streams. However, the effects of the fire are expected to rapidly diminish after the first year. Overall quantities are expected to be minor on the HUC6 and barely detectable at the HUC5 scales.

## **PART V - SUMMARY OF ANALYSIS**

### **Introduction/Background**

The HK Complex is a combination of 14 lightning fires that were reported on Aug.5, 2019 following a lightning storm on the Forest. The fires are located near the Alder Creek Skookum Trailhead, approximately two miles east of Tupper Guard Station. Firefighters and aerial resources were promptly dispatched to the fires, however strong evening winds produced rapid fire growth, causing some of the fires to grow together and increasing the overall fire size to approximately 2,705 acres.

**A. Describe Critical Values/Resources and Threats (narrative):**

*Table 5: Critical Value Matrix*

Probability of Damage or Loss	Magnitude of Consequences		
	Major	Moderate	Minor
	<b>RISK</b>		
Very Likely	Very High	Very High	Low
Likely	Very High	High	Low
Possible	High	Intermediate	Low
Unlikely	Intermediate	Low	Very Low

**1. Human Life and Safety (HLS):**

- a. There is an immediate and future threat to travelers along the roads within the burned area due to the increased potential for rolling and falling rock from burned slopes. With the loss of vegetation, normal storm frequencies and magnitudes can more easily initiate erosion on the slopes and it is likely that this runoff will cover the roads or cause washouts at drainage facilities (culverts) or stream crossings. These events make for hazardous access to forest roads and put the safety of users at risk.
- b. Safety of the public and Forest employees was also considered in the context of fire impacted hazard trees in the fire area. However, current fire suppression actions include falling all imminent hazard trees along open travel routes, including snowmobile routes, as well as dispersed camping sites, which will reduce this risk to an acceptable level.

**2. Property (P):** Roads within the HK Complex Fire contain drainage structures that cross streams located in watersheds that have a high, moderate, and low burn severity. These streams now have the potential for increased runoff and debris flows. These increases in flows pose a threat to the existing crossings which may result in plugging drainage structures or exceeding their maximum flow capacity. If these flows plug drainage structures, the result could be erosion and debris torrents further down the drainage due to the failure.**3. Natural Resources (NR): Weeds** Vehicles and equipment have the potential to spread seed from existing weed species that are within the fire area. Also, vehicles and equipment that were used on the fire have the potential to bring new potential invader weed species to the fire area. The spread potential of existing weed species is moderate, because the four existing sites that have been inventoried within the complex fires have been chemically and manually treated in the past and no weeds have been inventoried this season. However, disturbances (vehicle, equipment and the fire itself) has the potential to disturb the existing seed bed within these sites and even though weeds have not been detected at these sites this season, there is a high probability that existing seeds will germinated this fall (2019) or next spring (2020).**Fish**

- b. Anticipated post-fire effects for the HK Complex fire on the Heppner District, Umatilla National Forest on designated critical habitat for the Mid-Columbia River steelhead (MCR STS) are expected to be relatively minor. The majority of moderate to high intensity, stand replacing fire occurred on the steeper slopes along Little Bear Creek, with a much smaller amount in the upper reaches of of Bear Creek. Bear Creek has 1.01 miles of designated critical habitat for the MCR STS, in the lower part of the burn area. Critical habitat for MCR STS occurs below the burn perimeter for Little Bear Creek. No other critical habitat for ESA-listed species is present within the burn perimeter. Short-term, minor pulses of fine sediments and ash will likely occur in Bear Creek during spring high water and fall rains. These are diminished as distance downstream from the burn area increases. MCR STS are adapted to low to moderate amounts of fine sediments and ash resulting from wildfires.

**Soils**

- c. The critical value of Soil Productivity being threatened by soil loss resulting in loss of productivity is unlikely. The reason for such a ranking is due to the minimal acres of 'high' SBS on the landscape. It is also due to the patch or spotty distribution of 'high' and 'moderate' SBS within 'low' and non-burned areas. The magnitude of consequences of the fire is minor. 'High' SBS totals approximately 1 percent of the entire fire area. 'Moderate' SBS totals approximately 13 percent of the fire. The overall risk of soil productivity degrading across the fire area is low.

**4. Cultural and Heritage Resources:** Cultural types present in the HK Complex reflect the cultural history and represent both prehistoric and historic periods. Most of the site types are prehistoric and include lithic reduction areas and campsites. Historic land use includes site types representing homesteading, grazing, and marking of forest boundaries. Adverse effects may include the potential to bury surface and subsurface cultural resources and increasing the visibility of site locations that would make them more susceptible to looting or vandalism. When the BAER Risk Matrix is applied to cultural resources situated in moderate to severe post-fire conditions within the HK Fire Complex, the Probability of Damage or Loss is Possible whereas the Magnitude of Consequences is Minor, resulting in a low risk to cultural resource sites.

**B. Emergency Treatment Objectives:** The primary objective of this Burned Area Emergency Response Report is to recommend prompt actions deemed reasonable and necessary to effectively protect, reduce or minimize significant threats to human life and property and mitigate unacceptable risk of degradation to natural and cultural resources. The HK Complex BAER team has recommended treatments that address the emergencies presented in the post-fire environment with the most effective, minimum treatment. The application of these BAER treatments are expected to minimize the risk of on-site and downstream damages to the identified critical values.

#### Proposed Land Treatments

The objective of the land treatments are to:

1. Promote and protect native and naturalized vegetative recovery by reducing the spread of noxious weeds.

#### Proposed Road Treatments

The objective of the road treatments are to:

1. Protect road investments from becoming impassible and damaged due to increased post-fire runoff.
2. Reduce sedimentation into streams degrading water quality and endangered species habitat (Mid-Columbia River Steelhead).
3. Improve road drainage by installing drivable water-bars to reduce the potential for road failure due to increased flows

#### Proposed Protection/Safety Treatments:

The objective of the protection/safety treatments are to:

1. Protect human life and safety by raising awareness through posting hazard warning signs when entering the burn area.

#### **C. Probability of Completing Treatment Prior to Damaging Storm or Event:**

**Land** 90%

**Channel** NA

**Roads/Trails** 80-100%

**Protection/Safety** 100%

#### **D. Probability of Treatment Success**

*Table 6: Probability of Treatment Success*

	<b>1 year after treatment</b>	<b>3 years after treatment</b>	<b>5 years after treatment</b>
<b>Land</b>	80%	70%	60%
<b>Channel</b>	NA	NA	NA
<b>Roads/Trails</b>	80%	80%	80%
<b>Protection/Safety</b>	90%	90%	90%

#### **E. Cost of No-Action (Including Loss): \$35,053**

Human Life and Safety – Without signs describing hazards present in the burned area, a forest user could be unaware of risks and proceed without further consideration for their safety. Exposure to falling rocks, hazard trees, route loss and flooding are among the threats identified. The significance of protecting human life and safety is assumed self-evident and not included in the calculations used below to justify treatments.

Property – Certain road segments have been identified as being susceptible to damage by post-fire peak flows and increased runoff. A method called the Implied Minimum Value (IMV) is recommended to determine the cost-benefit ratio for values at risk where market value is not available. An IMV is assigned to the Property Values at Risk which equals **\$17,720**.

<b>IMPLIED MINIMUM VALUE</b>
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Estim. cost of treatments: \$ 10,632
Estim. Probability of Damage or Loss w/o Treatment: 80%
Estim. Probability of Loss if Treated: 20%
IMV = Treatment Cost/(Probability Loss Untreated - Loss Treated)
Implied Minimum Value (IMV) for Property $\$10,632/(0.8-0.2) = \$17,720$

**Natural Resources** – Without treatments to minimize post-fire effects from the spread of known populations of invasive plant species, there is a risk of diminishing native vegetation. Using the IMV method, the value of the native plant communities in threatened areas is **\$10,833**.

<b>IMPLIED MINIMUM VALUE</b>
Estim. cost of treatments: \$ 6,500
Estim. Probability of Damage or Loss w/o Treatment: 80%
Estim. Probability of Loss if Treated: 20%
IMV = Treatment Cost/(Probability Loss Untreated - Loss Treated)
Implied Minimum Value (IMV) for Property $\$6,500/(0.8-0.2) = \$10,833$

#### **F. Cost of Selected Alternative (Including Loss): \$20,358**

#### **G. Skills Represented on Burned-Area Survey Team:**

- ☒ Soils      ☒ Hydrology      ☒ Engineering      ☒ GIS      ☒ Archaeology  
☒ Weeds      ☒ Recreation      ☒ Fisheries      ☐ Wildlife  
☐ Other:

**Team Leader: Joe Blanchard**

**Email: joseph.blanchard@usda.gov**

**Phone(s): 541-957-3356**

**Forest BAER Coordinator: Brien Park**

**Email: brien.park@usda.gov**

**Phone(s): 541-278-3822**

**Team Members:** Table 7: BAER Team Members by Skill

<b>Skill</b>	<b>Team Member Name</b>
<i>Team Lead(s)</i>	Joe Blanchard
<i>Soils</i>	Brien Park
<i>Hydrology</i>	Mark Sommer, Lindsey King
<i>Engineering</i>	Luis Palacios
<i>GIS</i>	Jody Thomas
<i>Archaeology</i>	Laticia Neal

Skill	Team Member Name
Weeds	Tim Collins
Recreation	Janel Lacey
Other	Stephen Boe (Fish Biologist)

## H. Treatment Narrative: Land Treatments:

### Weed Treatments:

Funding will be used to inventory and treat noxious weeds (EDRR) that are associated with current sites within the HK Complex area that may have been spread around the fire area by suppression equipment. Ground disturbance from dozer control lines within and near inventoried weeds site will be the priority for EDRR related to suppression activities

Areas of moderate and high soil burn severity within or adjacent to inventoried weed sites will be another focus of inventory and treatment. Finding noxious weed species through early detection surveys and implementing treatments to prevent widespread occurrence throughout the burned area will be essential the first year following the fire to prevent long term or irreversible damage to this critical natural resource. Early detection and rapid response are key principles in preventing noxious weed infestations from becoming unmanageable and are the primary strategy prescribed during BAER assessments. A combination of manual and chemical treatments will be employed to treat infestations. Weed treatments will comply with existing NEPA coverage for weed treatment.

Weeds Treatments	units	Unit cost	# of units	Total \$
Invasives EDRR- Suppression	acres	\$100	15*	\$1,500
Invasives EDRR- Fire	acres	\$100	50**	\$5,000
<b>Total</b>				<b>\$6,500</b>

\*10 miles of dozerline through or near existing weed sites = 15 acres

\*\*50 acres of high and moderate SBS within or adjacent to known weed sites

### **Channel Treatments: None**

### **Roads and Trail Treatments:**

Storm Inspection and Response: Monitor road drainage structures on the FS 21 road after significant storm events to ensure the maximum drainage capacity is maintained until the natural re-vegetation of the burned area has occurred. Maintain and/or repair any damage to road surfaces. The purpose of patrols are to identify those road problems such as plugged culverts and washed out roads and to clear, clean, and/or block those roads that are or have received damage. The storm patrollers shall have access to at least a backhoe and dump truck that can be used when a drainage culvert is plugged or soon to be plugged and to repair any road receiving severe surface erosion. The BAER Team considered this treatment to be the minimum necessary to achieve a reduction in risk to the accumulated critical values. The treatment costs for this activity were calculated using an assumption that local FS engineering staff would spend 2 days on post-storm inspection and that heavy equipment would be mobilized once in response.

### Install Drivable Water-bars:

Install a series of approximately 20 drivable water-bars spaced every 200 feet along the section of the 122 road where it parallels Little Bear Creek and is directly downhill of moderate and high soil burn severity. Drivable water-bars provide relief flow path for overwhelmed cross drains or in-sloped roads with absent or inadequate cross drains to remove post-fire flows and sediment from the road prism, especially on steep road grades. Typically reserved for Level 2 roads with lower traffic and design vehicles.

Road Treatments	units	Unit cost	# of units	Total \$
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Storm Inspection and Response	miles	\$1,641	3.27	\$5,366
Drivable Water-bars	miles	\$7,314	0.72	\$5,266
<b>Total</b>				<b>\$10,632</b>

**Protection/Safety Treatments:**

Install Hazard Signs: Install "Entering Burned Area Fallen Rock and Debris" signs where necessary to properly alert the travelers of the dangers ahead. Five signs will be placed along roads entering the burned area including two on the 21 road, two on the 2107 road, and one on the 2100100 road.

<b>Safety Treatments</b>	<b>units</b>	<b>Unit cost</b>	<b># of units</b>	<b>Total \$</b>
Entering Burned Area Fallen Rocks And Debris Sign	each	\$645.20	5	\$3,226
<b>Total</b>				<b>\$3,226</b>

**Monitoring Narrative: None**

No monitoring funds requested

**PART VI – EMERGENCY STABILIZATION TREATMENTS AND SOURCE OF FUNDS**

Line Items	Units	Unit Cost	NFS Lands		Other \$	Other Lands				All Total \$
			# of Units	BAER \$		# of units	Fed \$	# of Units	Non Fed \$	
<b>A. Land Treatments</b>										
Weeds EDRR- Suppression	acre	\$ 100	15	\$1,500	\$0		\$0		\$0	\$1,500
Weeds EDRR- Fire	acre	\$ 100	50	\$5,000	\$0		\$0		\$0	\$5,000
				\$0	\$0		\$0		\$0	\$0
<i>Subtotal Land Treatments</i>				<b>\$6,500</b>	<b>\$0</b>		<b>\$0</b>		<b>\$0</b>	<b>\$6,500</b>
<b>B. Channel Treatments</b>										
None				\$0	\$0		\$0		\$0	\$0
				\$0	\$0		\$0		\$0	\$0
				\$0	\$0		\$0		\$0	\$0
<i>Subtotal Channel Treatments</i>				<b>\$0</b>	<b>\$0</b>		<b>\$0</b>		<b>\$0</b>	<b>\$0</b>
<b>C. Road and Trails</b>										
Storm inspection and resp	miles	\$1,641	3	\$5,366	\$0		\$0		\$0	\$5,366
Drivable water-bars	miles	\$7,314	1	\$5,266	\$0		\$0		\$0	\$5,266
				\$0	\$0		\$0		\$0	\$0
<i>Subtotal Road and Trails</i>				<b>\$10,632</b>	<b>\$0</b>		<b>\$0</b>		<b>\$0</b>	<b>\$10,632</b>
<b>D. Protection/Safety</b>										
Burn area road signs	each	\$ 645	5	\$3,226	\$0		\$0		\$0	\$3,226
				\$0	\$0		\$0		\$0	\$0
				\$0	\$0		\$0		\$0	\$0
<i>Subtotal Protection/Safety</i>				<b>\$3,226</b>	<b>\$0</b>		<b>\$0</b>		<b>\$0</b>	<b>\$3,226</b>
<b>E. BAER Evaluation</b>										
Initial Assessment	Report	\$25,000	1	---	\$25,000		\$0		\$0	\$25,000
				\$0	\$0		\$0		\$0	\$0
				---	\$0		\$0		\$0	\$0
<i>Subtotal Evaluation</i>				<b>\$0</b>	<b>\$25,000</b>		<b>\$0</b>		<b>\$0</b>	<b>\$25,000</b>
<b>F. Monitoring</b>										
None				\$0	\$0		\$0		\$0	\$0
				\$0	\$0		\$0		\$0	\$0
				\$0	\$0		\$0		\$0	\$0
<i>Subtotal Monitoring</i>				<b>\$0</b>	<b>\$0</b>		<b>\$0</b>		<b>\$0</b>	<b>\$0</b>
<b>G. Totals</b>				<b>\$20,358</b>	<b>\$25,000</b>		<b>\$0</b>		<b>\$0</b>	<b>\$45,358</b>
Previously approved										
Total for this request				<b>\$20,358</b>						

**PART VII - APPROVALS**

1. L. U. J.  
Forest Supervisor

10-22-19  
Date