Attachment 4
Standard Operating Procedure for Measuring Ice Thickness at Eagle River Flats Impact Area

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DEPARTMENT OF THE ARMY
INSTALLATION MANAGEMENT COMMAND
HEADQUARTERS, U.S. ARMY GARRISON, ALASKA AND FORT RICHARDSON (PROV)
724 POSTAL SERVICE LOOP #6000
FORT RICHARDSON, ALASKA 99505-6000

REPLY TO
ATTENTION OF:

IMPC-FRA-PWE

MEMORANDUM FOR RECORD

SUBJECT: Standard Operating Procedure (SOP) for Measuring Ice Thickness at Eagle River Flats (ERF) Impact Area, Fort Richardson, Alaska (FRA)

1. **Purpose**: The purpose of this directive is to establish standard procedures and proponents for measuring ice thickness within the ERF Impact Area. Ice thickness data will be used to determine whether adequate conditions exist to proceed with the firing of explosive munitions into the ERF Impact Area in accordance with existing policy and restrictions.

2. **Objective**: Ensure that consistent and representative ice thickness measurements are obtained to determine adequacy of ice cover prior to firing explosive munitions into the ERF Impact Area.

3. **Procedure for obtaining access to range and impact areas**:

a. ERF is an active impact area (dud-contaminated) where there is a high probability for encountering unexploded ordnance (UXO). All personnel entering the ERF Impact Area are required to be thoroughly briefed on the hazards of UXO and comply with all regulatory guidance in U.S. Army, Alaska (USARAK) Regulation 350-2, Army Regulation 385-63, DA Pam 385-63, and other governing regulations and certifications.

b. For safety reasons, at least two (2) personnel must be present during ice thickness assessment activities. Personnel entering the permanent impact area will be accompanied by a member of the USARAK Explosive Ordinance Disposal (EOD) unit or by other similarly qualified personnel in accordance with USARAK Regulation 350-2. Cold weather and dangers associated with accessing areas with unknown ice cover present potential hazards to personnel.

c. Testing will be initiated at the request of, and coordinated with, the Installation Range Officer (IRO) or his designee. Ice thickness testing must be conducted in advance of the first training event of the winter season that includes the use of point-detonating-fuzed ammunition. The IRO (or designee) will provide sufficient advance notice to the party performing the testing to allow the necessary planning and coordination with EOD. EOD availability is dependent on its manpower resources and established priorities.

d. The access roads and survey areas must be surface-cleared of UXO and/or other safety hazards prior to entry. This surface-clearing must be conducted before substantial snow cover is present. All UXO survey work must be performed by qualified personnel in accordance with USARAK Regulation 350-2.

4. **Location of Ice Thickness survey sites**:

a. Three locations have historically been used to assess ice thickness within the ERF impact area. Those locations are shown on Figures 1A and 1B and are designated locations Alpha, Bravo and Charlie. All three locations can be easily accessed from the trail system, provide adequate characterization of the ERF area and must be cleared by EOD prior to personnel entering the Permanent Impact Area. All three sites are located over ponds that are representative of open water conditions elsewhere in the ERF Impact Area. The ponds, when flooded, are at least five feet deep.

b. Global Positioning System (GPS) coordinates for the locations are as follows: Alpha (A) – (N)6765824.69, (E)358074.79; Bravo (B) – (N)6765983.14, (E)358006.09; and Charlie (C) – (N)6766334.54, (E)357968.52.

5. **Procedure for measuring ice thickness**:

a. Locations at which ice thickness is to be measured must be surface-cleared to ensure that the site is clear of UXO and/or other safety hazards. All UXO survey operations must be conducted by qualified personnel in accordance with USARAK Regulation 350-2.

b. The basic procedure is to cut holes in the ice at the locations indicated in Section 3. A hand axe or ice auger is used to make a hole in the ice large enough to insert the measuring device. At least two holes are to be drilled at each site to ensure adequate coverage for an accurate assessment.

c. An L-shaped measuring tool, shown in Figure 2, is inserted through the hole and hooked under the bottom edge of the ice. Any surface snow cover is removed and the measuring tool is pulled up against the bottom of the ice sheet and the thickness of the ice is determined by recording the reading of the ruled edge corresponding to the top surface of the ice (see Figure 2). The proponent agency is responsible for procurement/fabrication of the required tool.

d. If frozen or partially frozen sediments are encountered immediately under the ice, determine the location of the boundary between the ice and sediments. Place the top

surface of the bottom L portion of the L-formed tool at the boundary and record a thickness measurement as indicated previously.

e. Record all applicable data on the Ice Thickness Testing Report form. Indicate findings in the appropriate area in the Conclusions section.

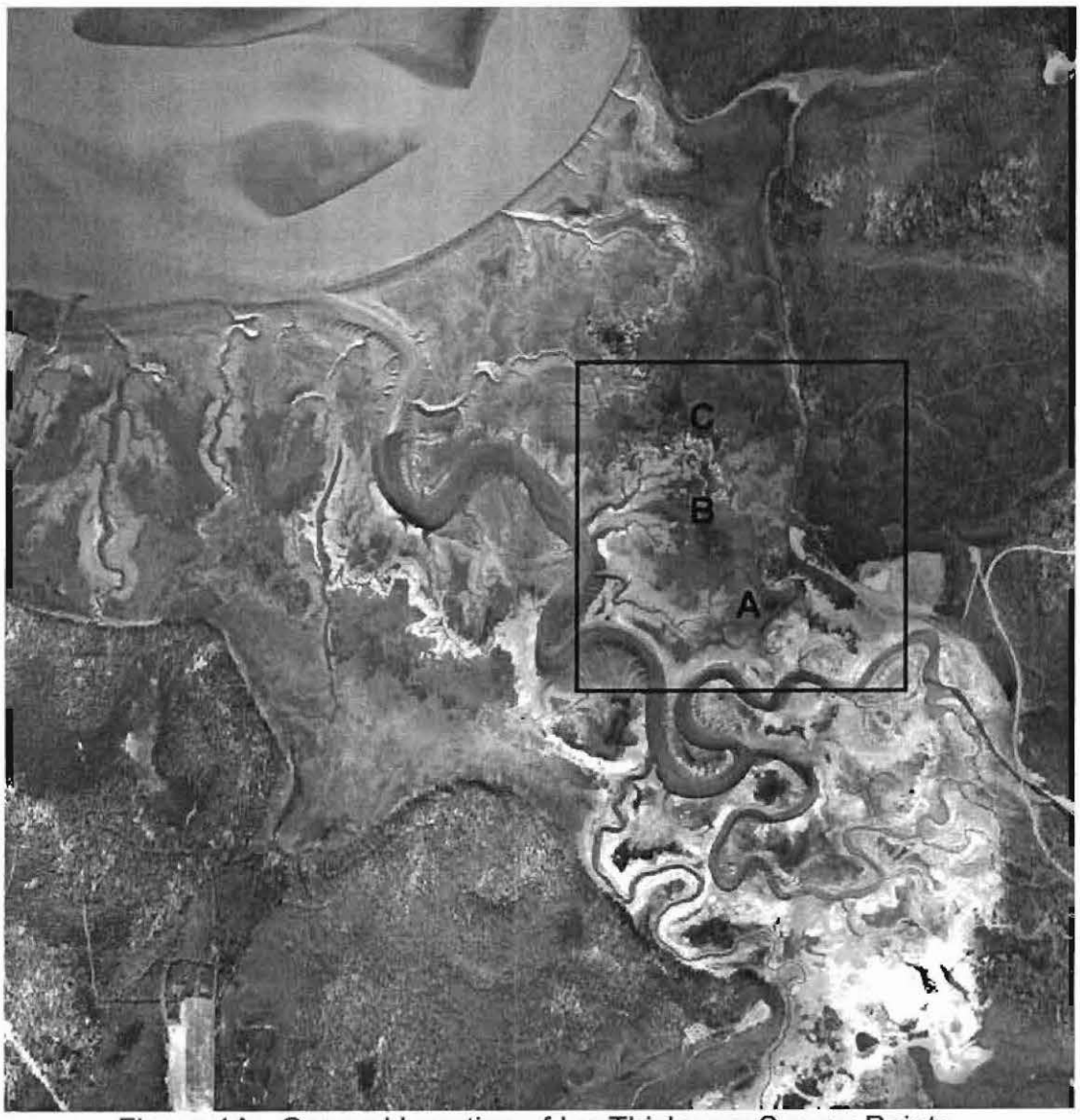


Figure 1A: General Location of Ice Thickness Survey Points.

Figure 1B: Location of Ice Thickness Survey Points

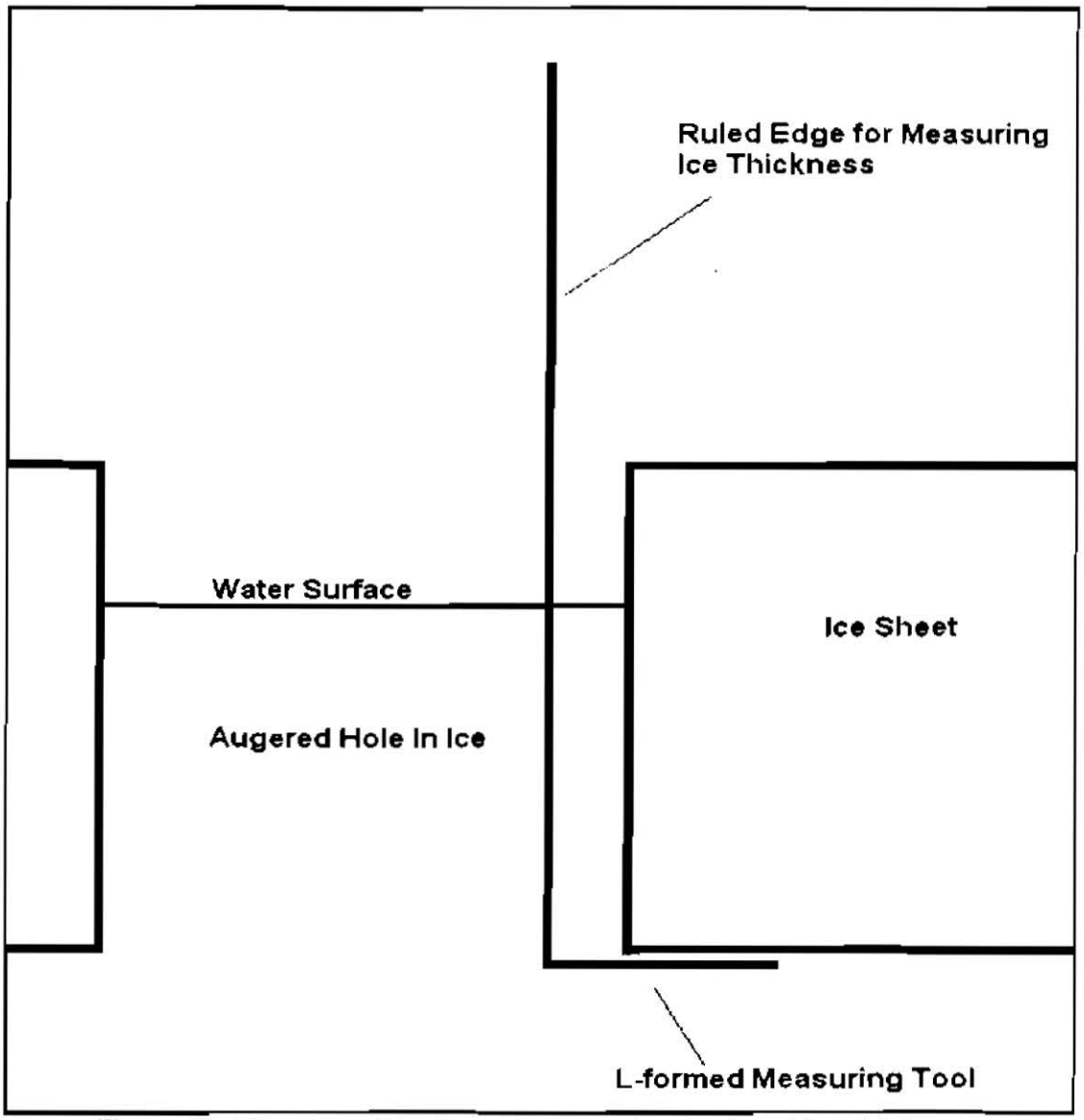


Figure 2: Diagram of L-shaped measuring tool and ice thickness measurement scenario

6. **Timing, frequency, and reporting of measurements**:

a. Ice thickness testing will not begin until weather patterns indicate that freezing conditions are predominate at the ERF, generally in late October. Weather conditions and patterns vary from year to year, so it is not possible to establish a start or end date for monitoring. Testing need not begin until unit training requests have been scheduled, and testing must precede the first training event of the winter season. The IRO will provide sufficient advance notice to the party performing the testing.

b. Once adequate ice conditions are present, monitoring events may be suspended unless weather warming trends indicate a need to conduct further monitoring to insure requisite ice thickness for firing still exists.

c. As warm weather conditions develop during the spring (generally late March), ice thickness testing must again be conducted as frequently as necessary to ensure that training does not take place when minimum ice thickness is not attained.

d. The party performing the testing will submit ice thickness reports to the IRO who will maintain the reports for three years.

7. **Duties and responsibilities**:

a. During winter of 2006 and 2007, the Directorate of Public Works (DPW) Environmental office will be responsible for conducting testing, and will validate the testing procedures. DPW Environmental will contract and coordinate appropriate EOD services to conduct testing and provide information to the IRO.

b. By spring 2007, DPW Environmental and the Installation Range Management Department will jointly conduct ice thickness testing for mutual training purposes.

c. By fall 2007, the Installation Range Management Department will be responsible for conducting all testing.

8. **Effective date**: This SOP takes effect upon publication.

9. Point of contact for this memorandum is Cristal Fosbrook, Chief Clean Up Branch for DPW at (907) 384-2713.

Encls
Ice Thickness Testing Report
ERF Impact Area Map

APPROVED BY: D. L. Shutt
DAVID L. SHUTT
COL, AR
Commanding

DISTRIBUTION:
IMPC-FRA
DPTSM
DPTSM Range Control

Range Control determines where ice will be tested. WHS

IMPC-FRA-PWE
SUBJECT: Standard Operating Procedure (SOP) for Measuring Ice Thickness at Eagle River Flats (ERF) Impact Area, Fort Richardson, Alaska (FRA)

DISTRIBUTION CONT:
DPW
DPW Environmental
SJA Office
Garrison Commander

ERF Ice Thickness Testing Report

Report Date _____

To Installation Range Management Department
ATTN: APVR-RPTM-R (Mr. Fussner)

Purpose To meet the requirements of the of the 1991 Environmental Assessment for firing into the Eagle River Flats Impact Area, Fort Richardson, Alaska

Reference Standard Operating Procedure for Measuring Ice Thickness at Eagle River Flats Impact Area (June 2006)

Results

Ice thickness was measured on _____. Ice thickness varied from ____ to ____ inches:
(date)

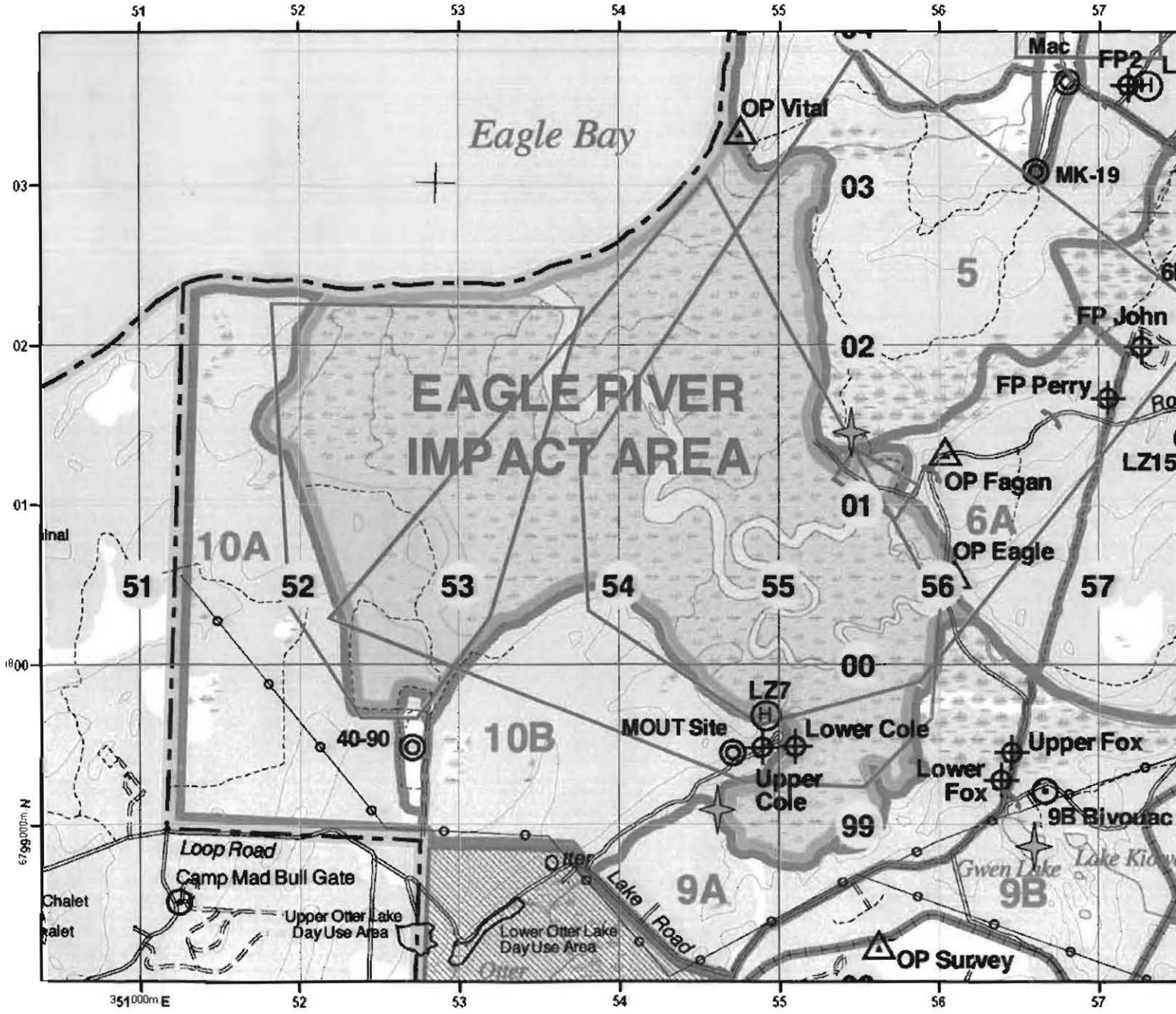
Area	Ice Thickness (inches)
A1	
A2	
B1	
B2	
C1	
C2	

No exposed sediment conditions were noted in non-ponded areas. Some areas of overflow were noted near the test areas but thick ice conditions were prevalent.

Conclusions

In accordance with established requirements, the munitions *checked* below can now be used at ERF and until further notice:

Helicopter door gunnery (small arms) October 16 to March 31, and No waterfowl present	
High explosive proximity fuse (VT) rounds October 16 to March 31, and No waterfowl present	
Illumination rounds October 16 to March 31, and No waterfowl present	
Point Detonating Mortar & Rifle Grenade Rounds Minimum Ice Thickness 2 inches	
Point Detonating Artillery Rounds Minimum Ice Thickness 5 inches	


EAGLE RIVER
IMPACT AREA
Eagle Bay
OP Vital
Mac
FP2
MK-19
FP John
FP Perry
OP Fagan
OP Eagle
LZ15
LZ7
MOUT Site
Lower Cole
Upper Cole
Upper Fox
Lower Fox
9B Bivouac
40-90
Loop Road
Camp Mad Bull Gate
Chalet
Upper Otter Lake Day Use Area
Lower Otter Lake Day Use Area
Otter Lake Road
Gwen Lake
OP Survey
10A
10B
9A
9B
6A
5
03
02
01
00
99
51
52
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54
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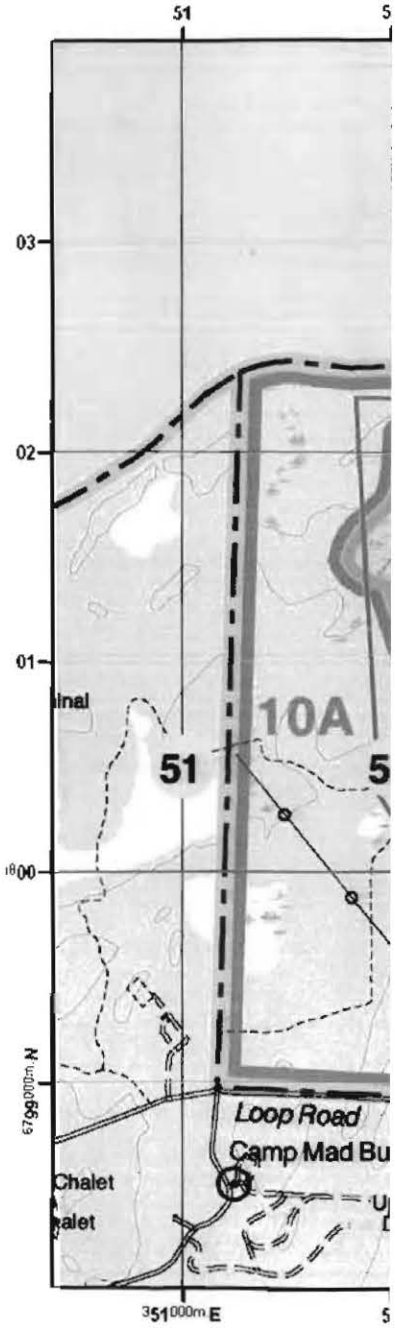
51
03
02
01
10A
51
Loop Road
Chalet
351000m E

STAFF SUMMARY

DATE 10 Jan 07

TO	FROM
Garrison Commander	DPW Environmental

SUBJECT	ACTION OFFICER (SIGNATURE)	SUSPENSE
ERF Remedial Action – Ice Thickness testing Standard Operating Procedure (including ERF Ice Thickness Testing Report form)	TYPED NAME, RANK & PHONE **Cristal Fosbrook, Chief, Clean Up, 384-2713**	31 Jan 07

Reason for Action Obtain signature on report cover letter

FACTS/DISCUSSION

This SOP will establish a clear and reproducible procedure for determining and reporting the thickness of ice cover on the Eagle River Flats Impact Area. Minimum ice thickness over the ERF Impact Area is one of several prerequisites to the use of point detonating-fused mortar, artillery, and other explosive ammunition in training. The ice thickness standards (for mortars and for artillery) are specified in a Record of Environmental Consideration for ERF Impact Area.

RECOMMENDATIONS Approve and sign document

COORDINATION

OFFICE	SIGNATURE	CONCUR	NONCONCUR
Chief, Environmental Division	SEE ATTACHED		
DPW Director	SEE ATTACHED		
DPTSM Larry Fussner	SEE ATTACHED		
SJA Office	SEE ATTACHED		
Deputy Garrison Commander			

ENCLOSURES	APPROVED (SIGNATURE)	DISAPPROVED (SIGNATURE)	
	TYPED NAME & RANK **DAVID L. SHUTT** **COL, AR** **Commanding**	TYPED NAME & RANK **DAVID L. SHUTT** **COL, AR** **Commanding**	

USARAK Form 407

1 Nov 94

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Cristel-
Good work- I added a comment to ensure clarity
Thanks!