



BPLF Lunar Analogue Field Test 2009

Briefing Topic:

**LER 14-Day Traverse (Crew A)
Day 4 (North Side, N2, with K10 input)**

3 September 2009



Mission Science Objectives

Top-level objectives

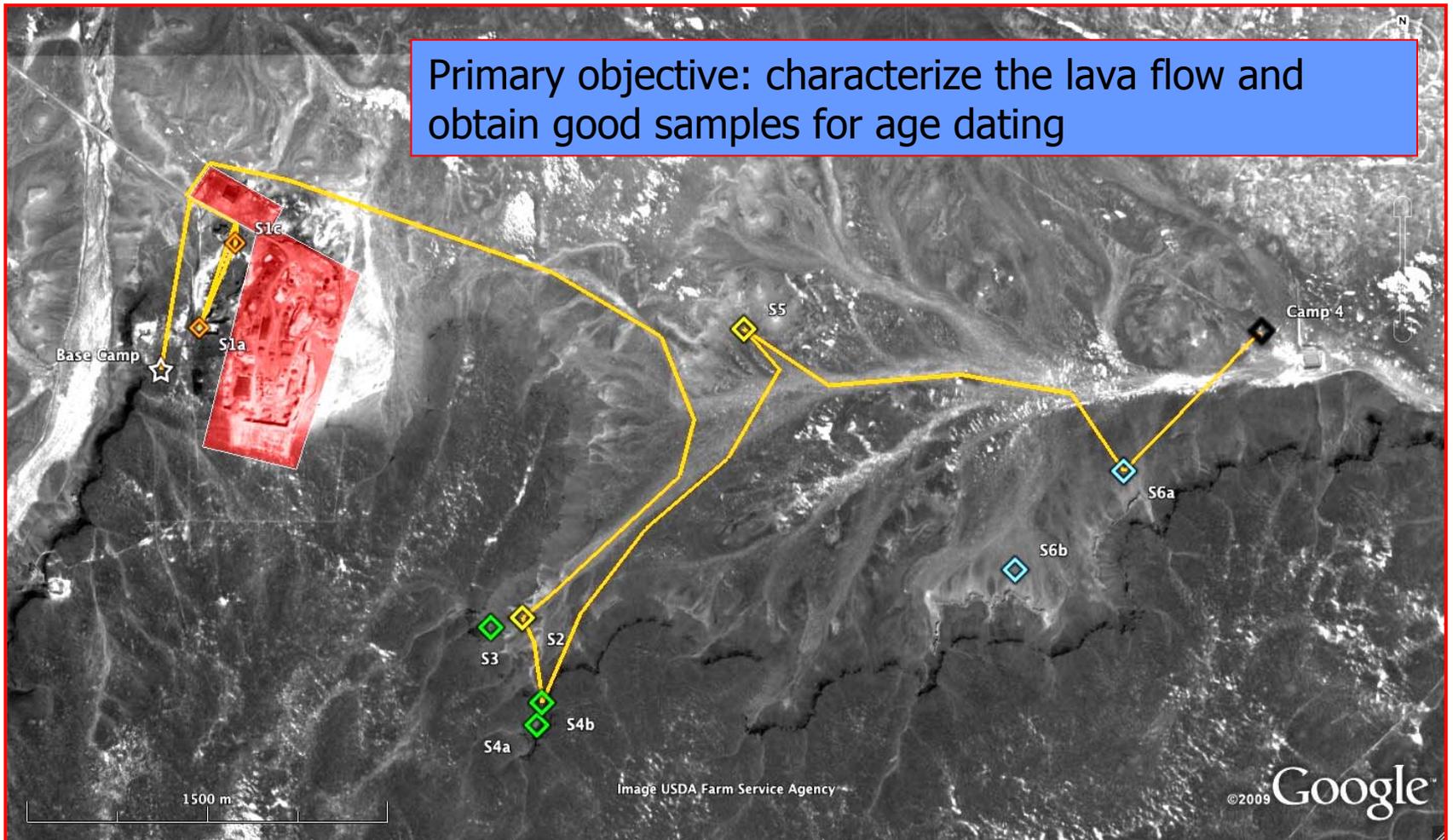
- Determine the origin (nature) and relative ages of geologic units to determine the geologic history of the site
- Locate and collect suitable samples that will further elucidate these issues when analyzed in a terrestrial laboratory

Specific test site objectives

- Characterize the Black Point Lava Flow (age, morphology, flow structure, petrology, chemistry, and any spatial or temporal variations)
 - Determine the relationship of BPLF with other volcanic features in the area
 - Characterize other geologic units in the area
 - Characterize the structural evolution of the area
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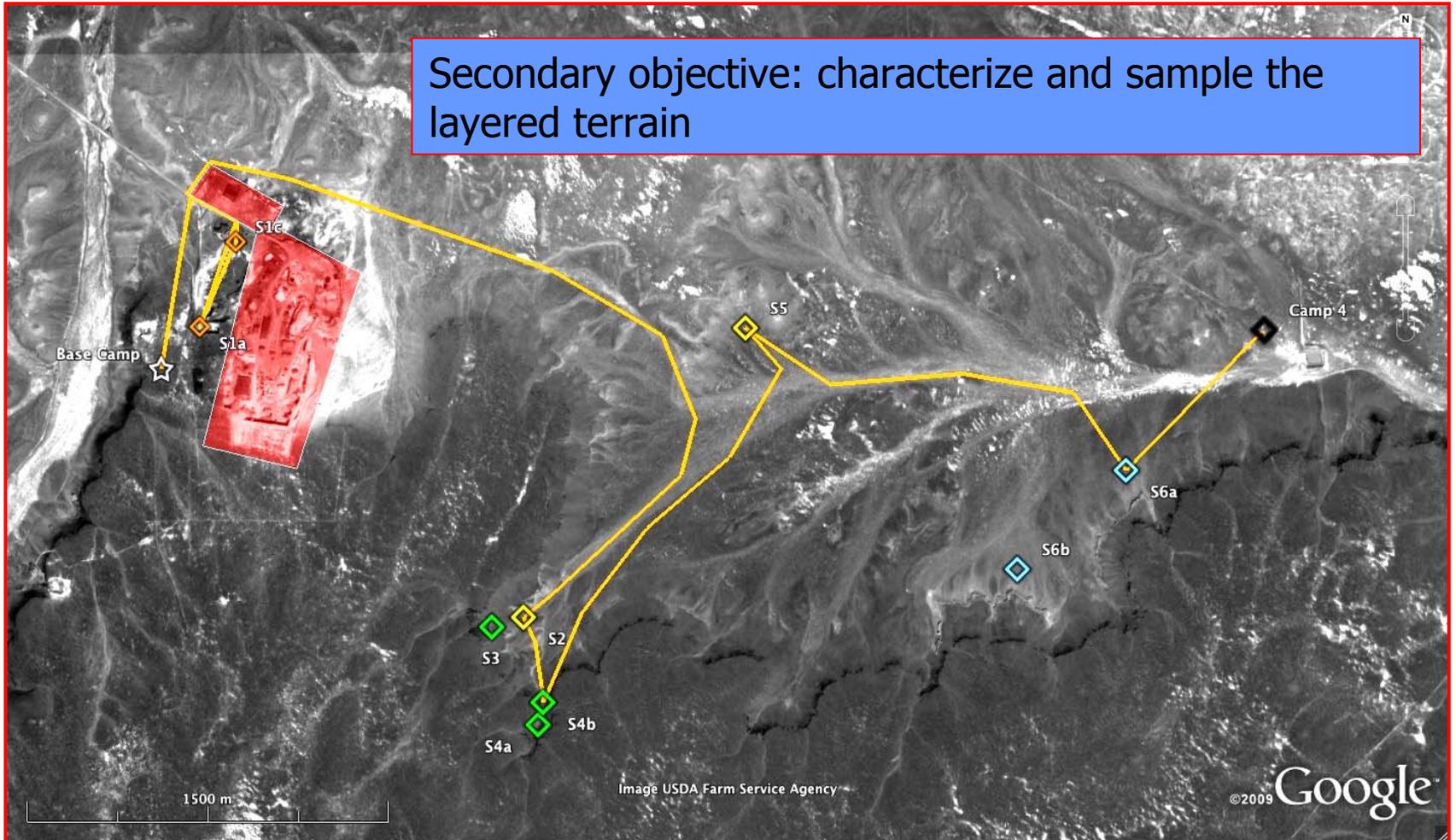
Traverse Science Objectives

Primary objective: characterize the lava flow and obtain good samples for age dating



Traverse Science Objectives

Secondary objective: characterize and sample the layered terrain



Traverse Science Objectives

Method:

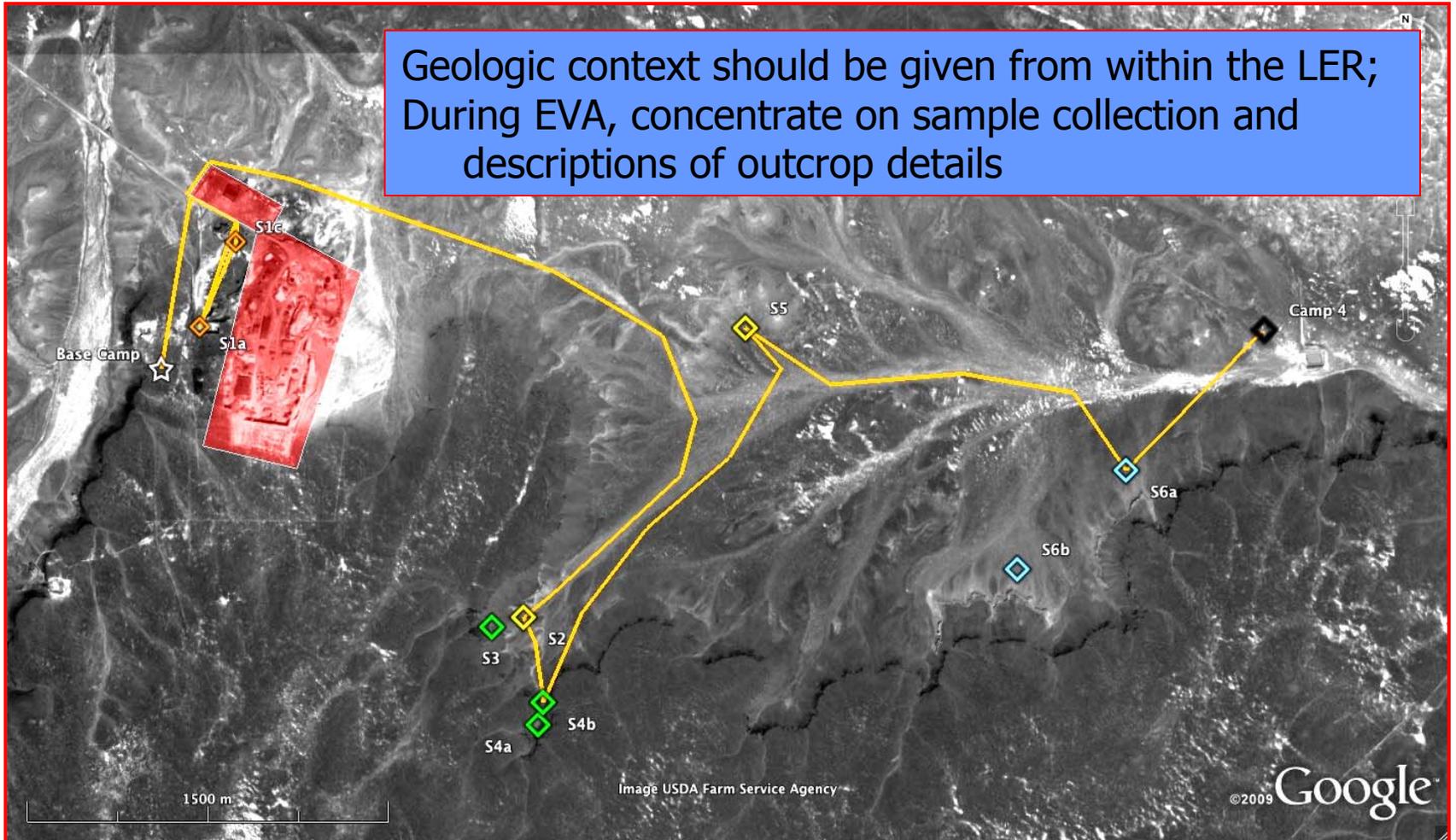
- 1) Confirm photogeologic assessment
- 2) ***But*** focus on those details that can only be deciphered by crew on the surface

We want to learn new things.



Traverse Science Objectives

Geologic context should be given from within the LER; During EVA, concentrate on sample collection and descriptions of outcrop details

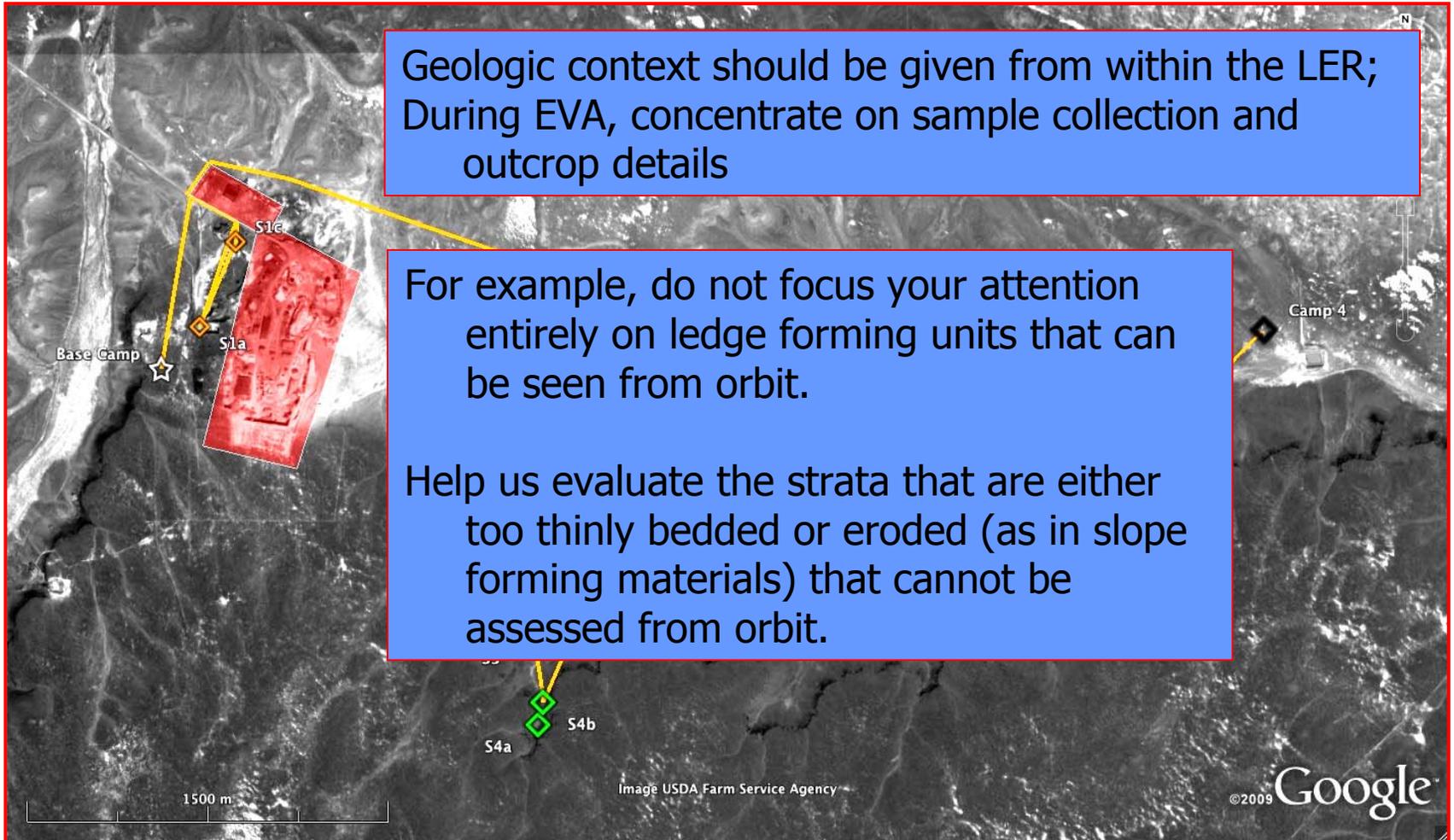


Traverse Science Objectives

Geologic context should be given from within the LER;
During EVA, concentrate on sample collection and
outcrop details

For example, do not focus your attention
entirely on ledge forming units that can
be seen from orbit.

Help us evaluate the strata that are either
too thinly bedded or eroded (as in slope
forming materials) that cannot be
assessed from orbit.



Station 1



Station 1(a-c):

Sample basin floor and units exposed in walls.

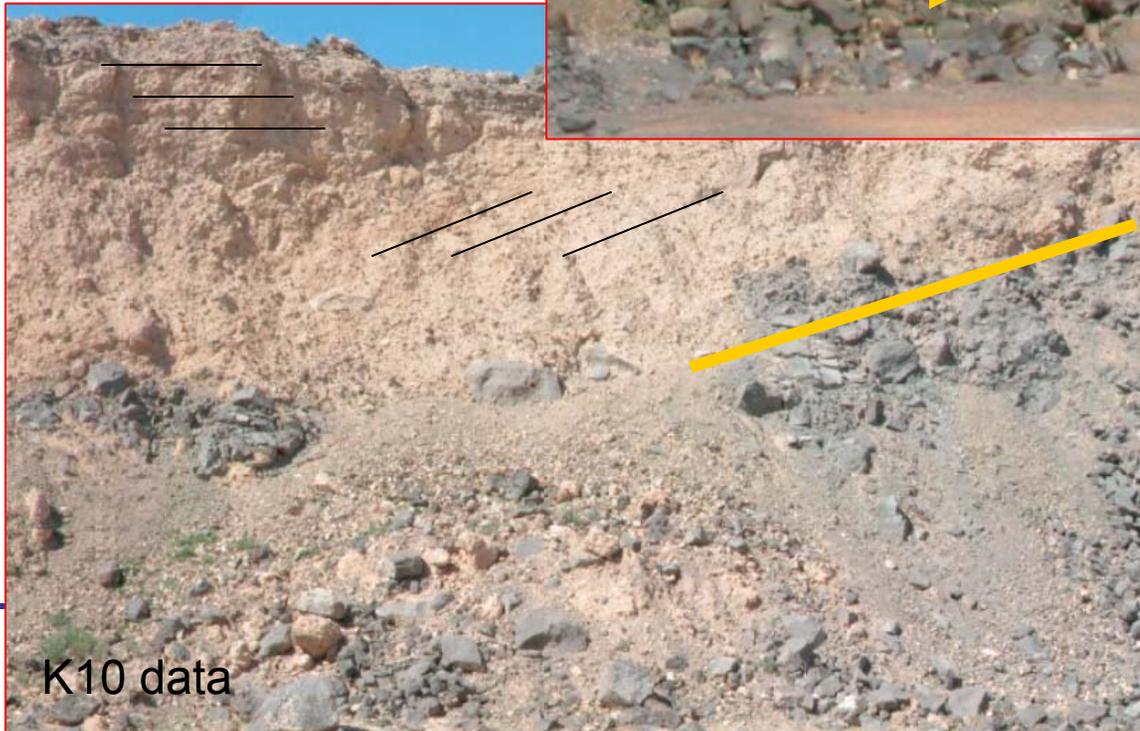
Crew surveys basin while driving to 1a; egress at 1a.

Good opportunity to sample cross-section of lava flow plus sediments that are deposited into topographic low on flow surface.

Use aft steering to go to location marked with , if top of lava flow is not accessible at 1a.

Station 1

Try to locate an area where top, middle, and base of flow can be sampled.

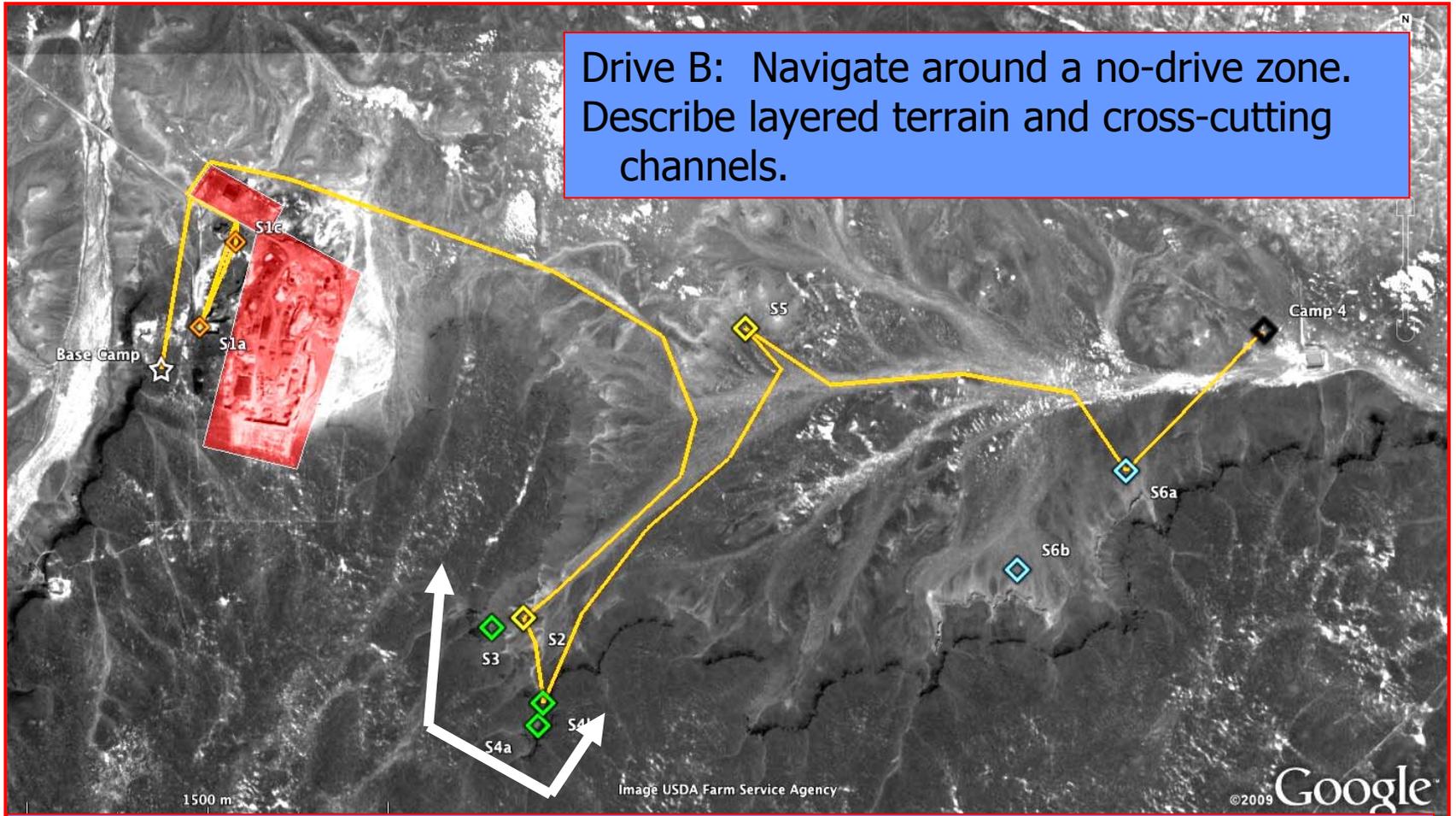


Is the lava flow surface uneven?

Is there cross-bedding in overlying sediments?

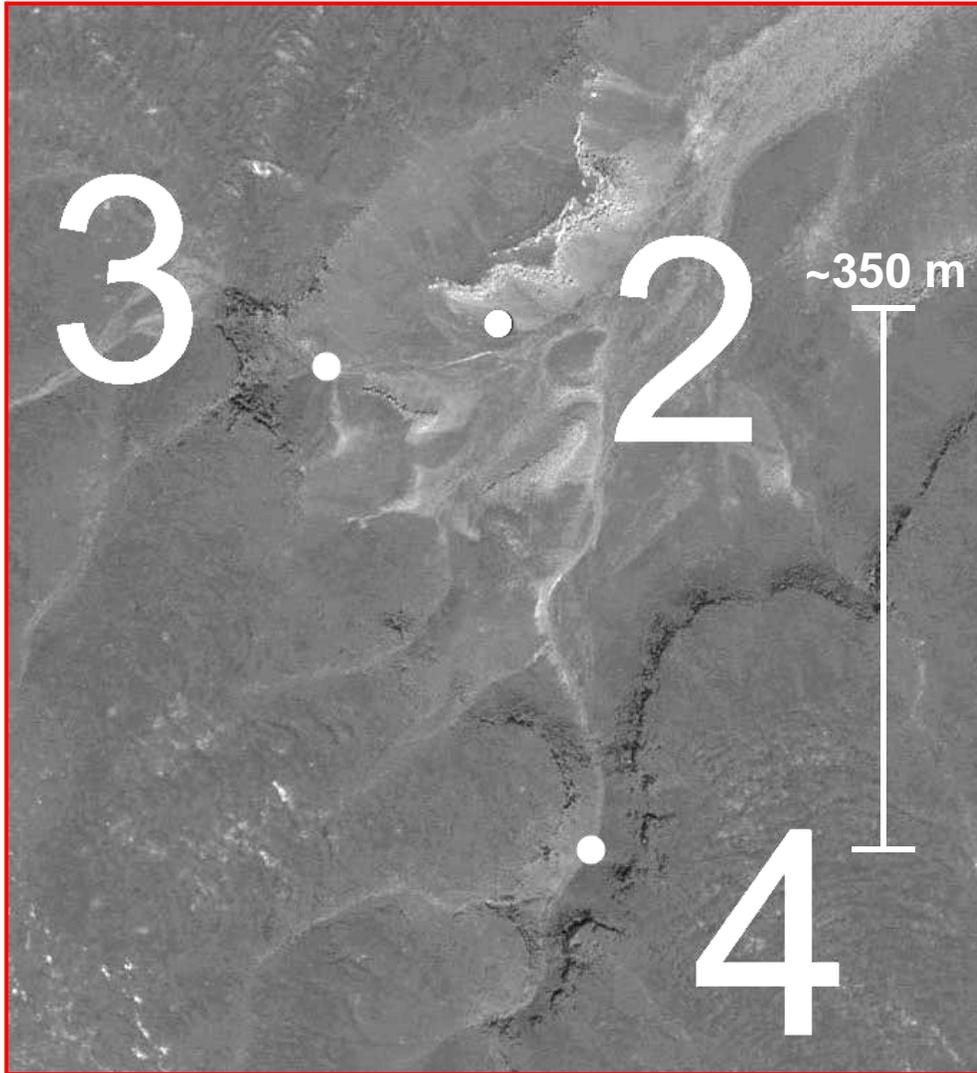
Drive B to Station 2

Drive B: Navigate around a no-drive zone. Describe layered terrain and cross-cutting channels.



Stations 2-4: Are these two lobes the same lava flow or two different lava flows?

Station 2



Station 2:

Describe and sample layered unit at base of flow

If exposed, describe and sample the contact with the overlying basalt flow

Sample adjacent channel deposit

Drive C:

Crew can use aft steering controls if they prefer between S2 and S3

Station 2



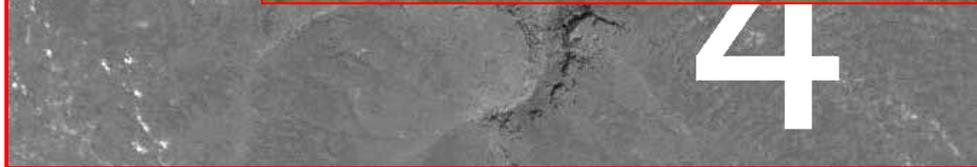
Station 2:

Describe and sample layered unit at base of flow

If exposed, describe and sample the contact with the overlying basalt flow

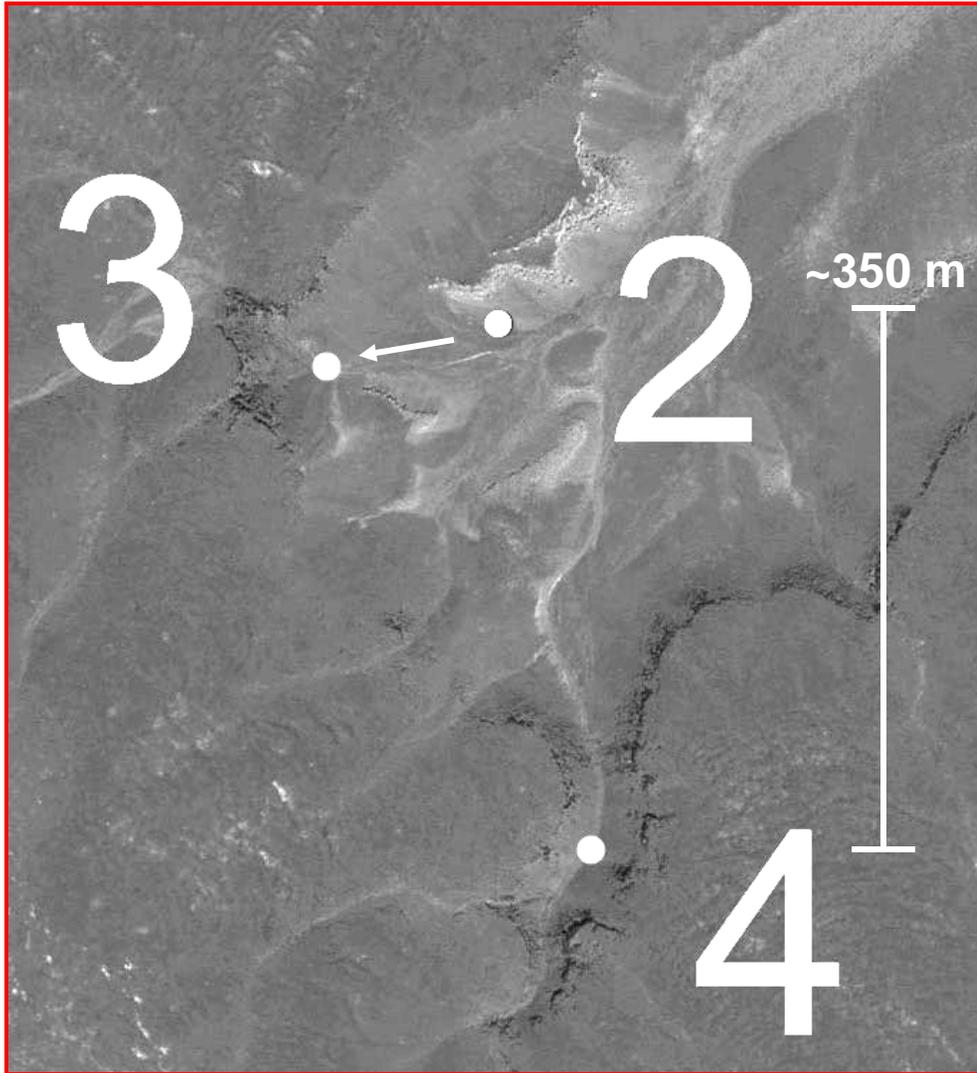


channel



Crew can use art steering controls if they prefer between S2 and S3

Drive C



Station 2:

Describe and sample layered unit at base of flow

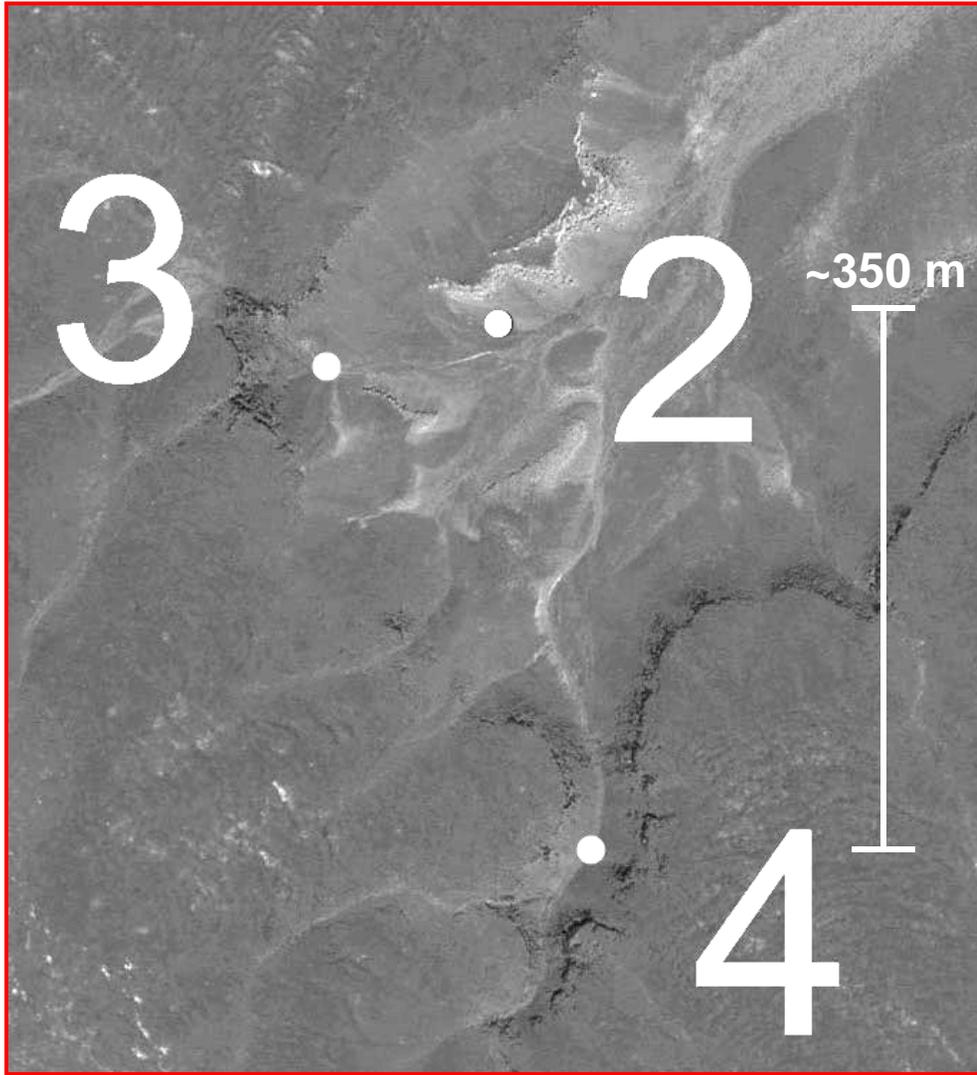
If exposed, describe and sample the contact with the overlying basalt flow

Sample adjacent channel deposit

Drive C:

Crew can use aft steering controls if they prefer between S2 and S3

Station 3



Station 3:

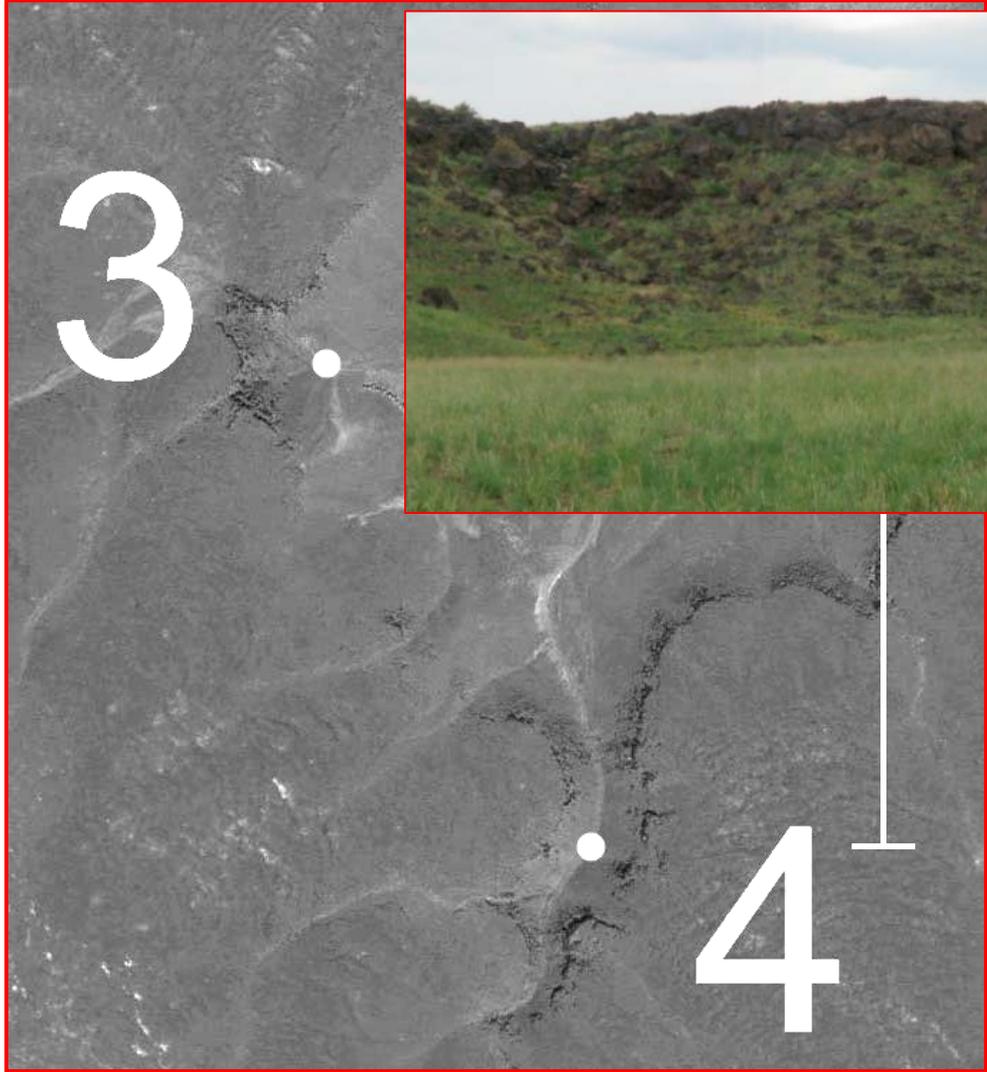
Describe and sample a cross-section of the lava flow; the top of the flow is well-exposed

Drive D:

Crew can use aft steering controls if they like between S3 and S4.

Describe edge of lava flow and describe any lateral variability

Station 3 and Drive D



K10 data

cross-
the

Drive D:

Crew can use aft steering controls if they like between S3 and S4.

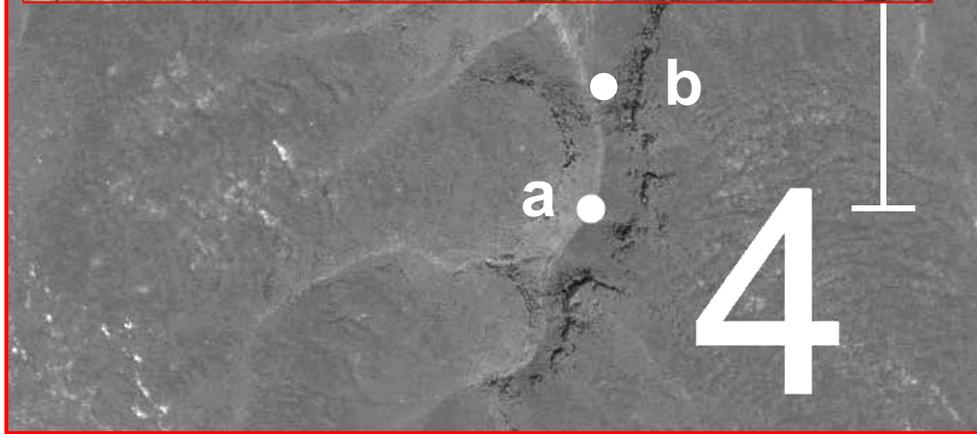
Describe edge of lava flow and describe any lateral variability

Station 4

K10 data



View looking up at
Station 4a from 4b



Station 4:

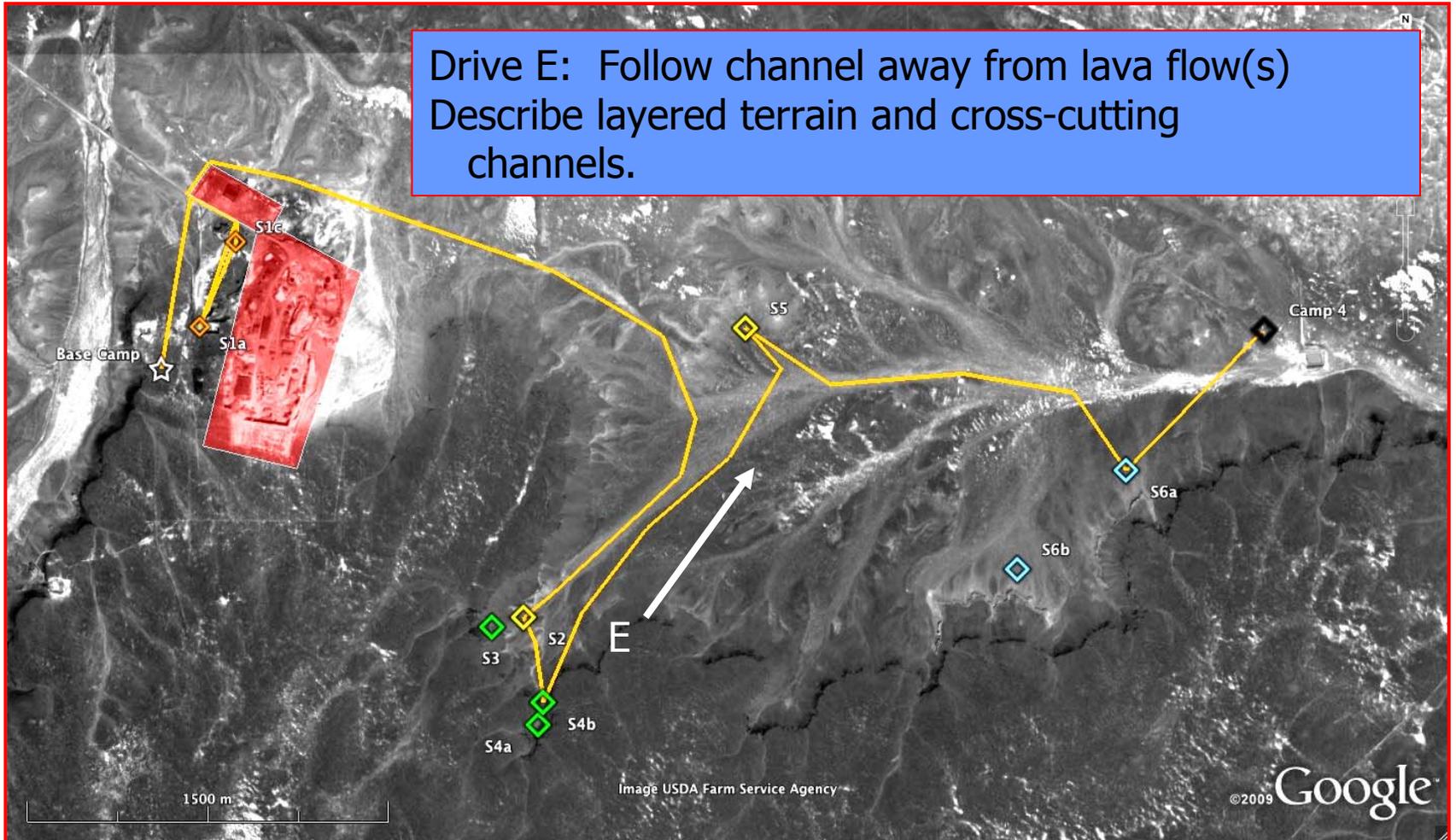
LER may not be able to reach S4a, in which case parking at S4b may be necessary.

Describe and sample a cross-section of the lava flow; the top of the flow is well-exposed

Is this the same flow as that at Stations 3 and 1?

Drive E to Station 5

Drive E: Follow channel away from lava flow(s)
Describe layered terrain and cross-cutting
channels.



Station 5



Station 5:

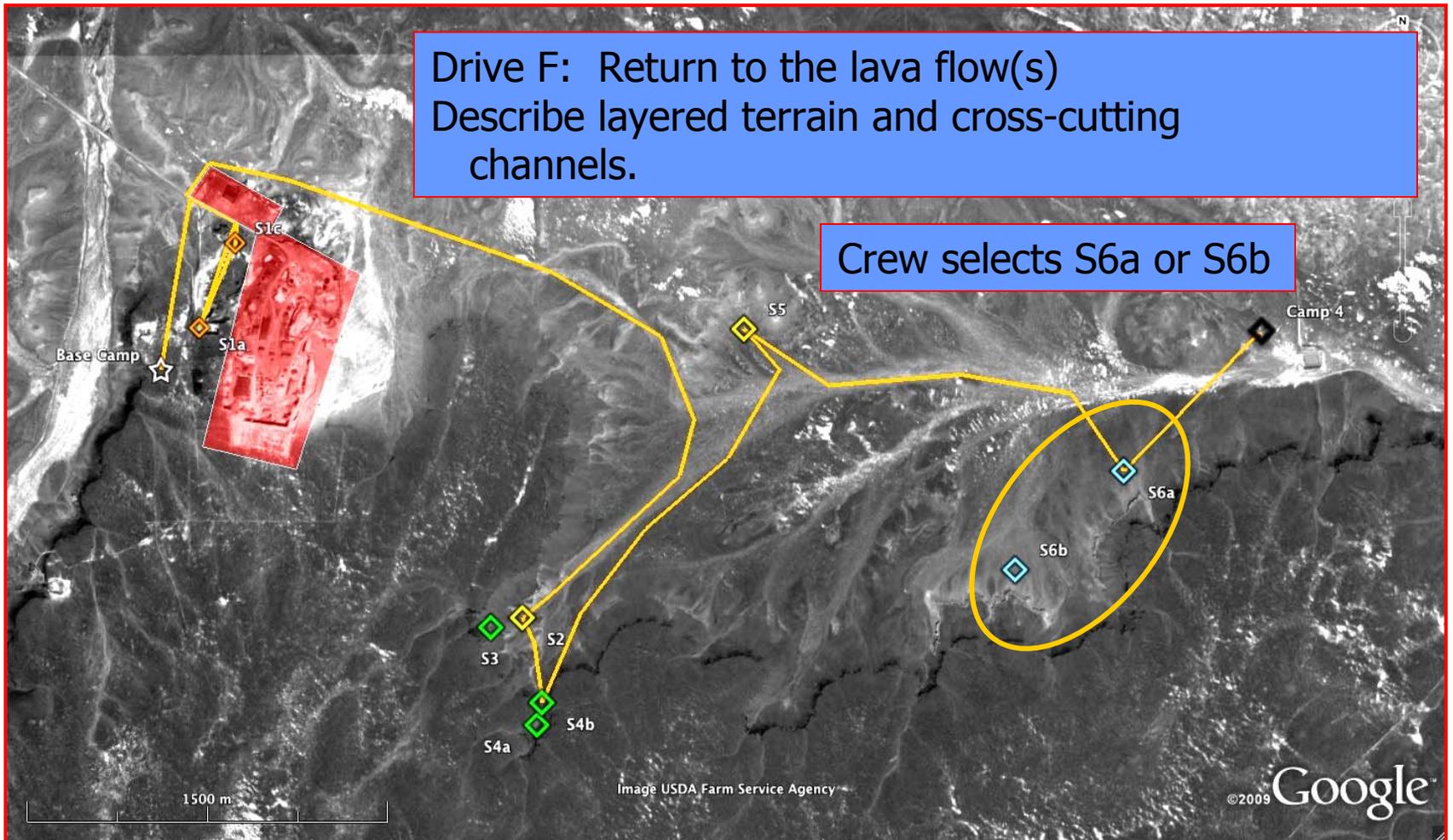
Describe and sample
the relatively-dark
albedo unit in layered
mesa

Compare to layered
unit at Station 2

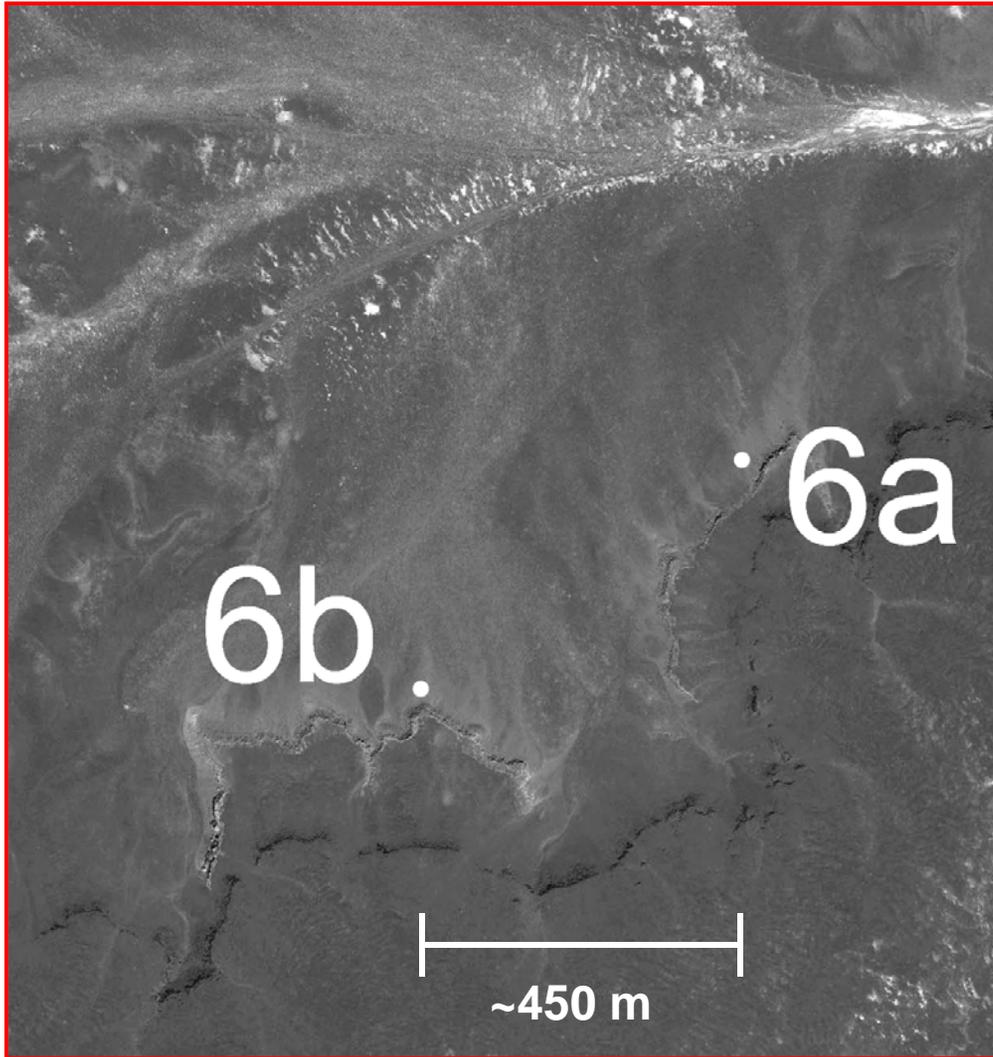
Drive F to Station 6a or 6b

Drive F: Return to the lava flow(s)
Describe layered terrain and cross-cutting channels.

Crew selects S6a or S6b



Station 6



Station 6(a-b):

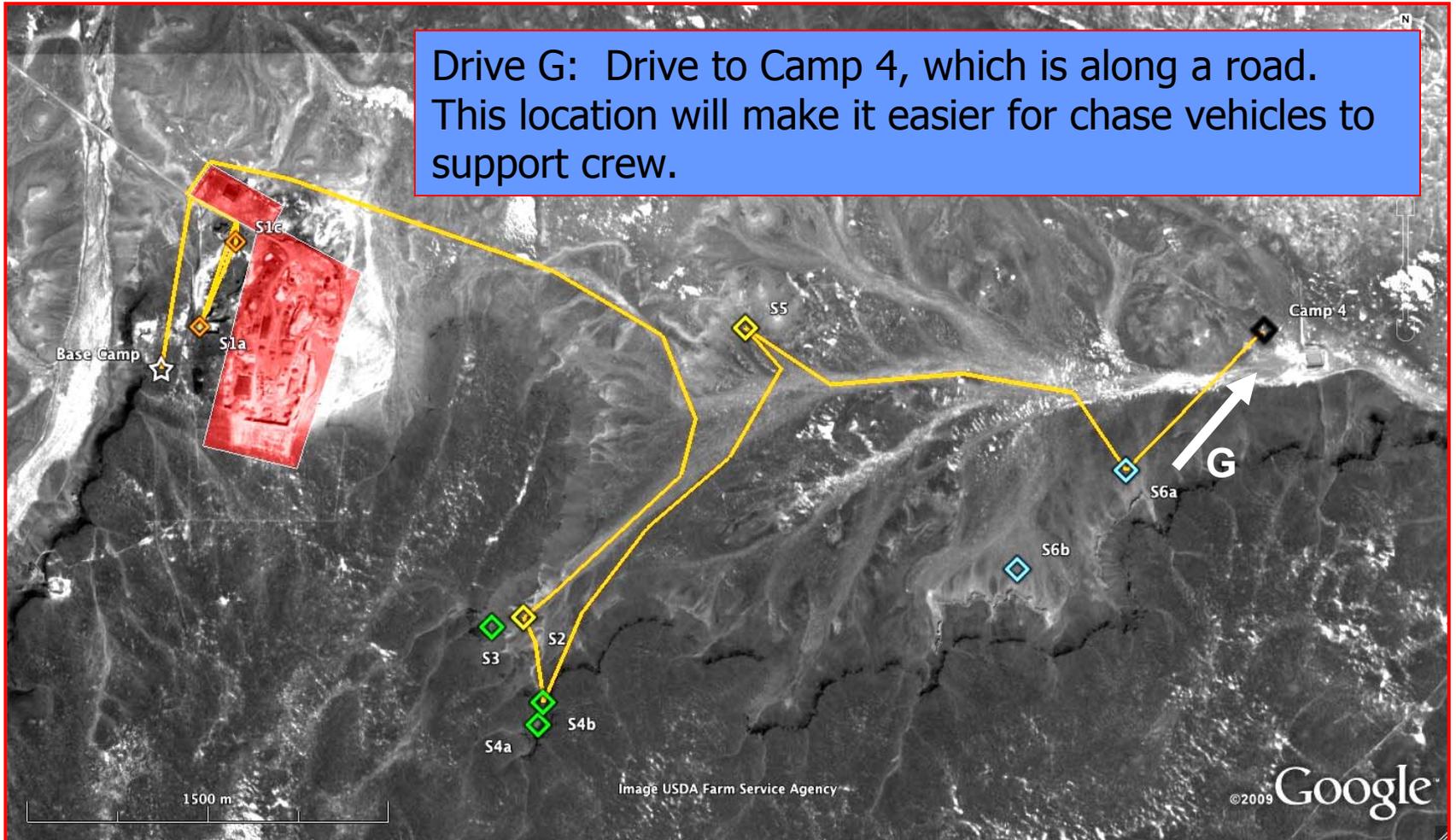
Describe and sample the bedrock layer beneath the flow and the bottom of the flow

Crew selects 6a or 6b

Compare to layered unit at Station 2

Drive G to Camp 4

Drive G: Drive to Camp 4, which is along a road. This location will make it easier for chase vehicles to support crew.





Major Questions for Today

- **Is there a single lava flow or are there multiple lava flows along the traverse?**
- **Is the dark-albedo layered terrain a sedimentary unit or a volcanoclastic unit? Answer: Sedimentary per Day 3. Now try to elucidate additional details of the sedimentary environment. What type of sed environment was it?**

Throughout the day:

- Describe the terrain and relationships between units
 - Collect representative samples for analyses
 - e.g., to determine the age of the lava flow
 - e.g., to probe the composition & thermal evolution of the planet's interior
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At End of Day

- **Give me a geologic history of the site**
- **Each day forward, we will discover additional geologic detail and the fidelity of that history should increase**

