DUSEL, Value Engineering, CD1, and the Science Collaboration Executive Board

Major Issues

1. Preference for mixed technology solution for Far Detector configuration likely exceeds $1.1B by significant margin. Initial estimate ~$2.0B. After some VE estimates perhaps as low as $1.5B. After cost cutting is done, it is likely that our preferred solution may not be affordable – thus our preferred solution – a WC detector at 4850 **and** a LAr detector at 800 may not be affordable in our first phase.
2. NSB actions show that serious problems with **Stewardship** also exist in Washington and not just at DUSEL. How to handle this?

History of DUSEL Site Selection

2000 First meeting of Bahcall Committee to look at DUSEL for U.S.

2001 Committee rejects Soudan, WIPP, and recommends Homestake or San Jacinto be DUSEL sites.

2002-2003 Many complaints about unfairness the ad hoc nature of the selection process

2004 community (and congressional?) pressure lead to formal selection process. First "S1" workshop. S2 solicitation issued. Eight proposals submitted.

2005 S2 awards made to Henderson and Homestake. Protest lodged by Washington State. NSF opens up S3 competition to all comers again.

2006 S3 solicitation issued. people work on development of lab proposals.

2007 S3 proposals submitted for four sites. Homestake selected.

Time from first recommendation to site selection:
SEVEN YEARS

Discovery Science

- "Discovery" level science means that you are the first to find important new knowledge.
- If we are delayed 3,4,5 years are chances for discovery level science fade – we will be forced to do "Interesting" science instead of Discovery science.
- We have a lot of information on Homestake site, legal and environmental issues largely settled, lots of documentation of impartial reviews to justify site selection, distance is right, local support excellent.

- Unpredictable delays in selection and time for detailed characterization of a new site diminish chances for Discovery science.
- Surface option seriously reduce scope of science and engagement of physics community. Possibility of “billion dollar re-do of NOVA”.
- For these reasons, the sense of the EB is that we should continue to concentrate on the Homestake **underground** site while this remains a **viable** and **affordable** option.

Institution	IB rep	person	status
Alabama	Stancu	VC Research	sent
BNL	Diwan	Director	sent
Boston	Kearns		declined
Caltech	McKeown	President	sent
Columbia	Leslie Camilleri	Exec VP Research	sent
Chicago	Blucher	President	declined
Colorado	Alysia Marino	VCR	sent
Colorado State	Wilson	President	sent
Crookston	DeMuth	Chancellor	sent
Dakota State	Szczerbinska	President	sent
Davis	Svoboda	chancellor	declined
Drexel	Lane	Chair	sent
Duke	Scholberg,Walter	Dean and Chair	sent
Duluth	Habig	Chair	sent
Hawaii	Learned	VCR	working on it
Indiana	Urheim	VPR	sent
Iowa State	Sanchez	VPR	sent
Irvine	Sobel	Dean/VCR	Dean sent/VCR not yet
KSU	Horton-Smith		declined
LSU	Kutter	Chancellor	sent
Maryland	Sullivan	President	sent
Michigan State	Bromberg		declined
Minnesota	Marshak,Cushman	dept chair	sent
MIT	Conrad	Dir Lab NS	sent
New Mexico	Matthews		status requested
Note Dame	Weischer,LoSecco	VPR	sent
Penn	Lande	Pres or Provost	VP Reseach completed
Pitt	Naples		working on it
Princeton	McDonald		status requested
Rensselaer	Napolitano	VPR	declined
Rochester	Wolfs,McFarland	Dean of Research	sent
South Carolina	Mishra	President	sent
SDSU	McTaggert	President	sent
SDSMT	Bai		declined
SMU	Ye,Cooley	Dean of Research	sent
Texas	Lang		status requested
Tufts	Gallagher	President	sent
UCLA	Lee	Dean	working on it
Va Tech	Link	President	sent
Washington	Tolich	Vice Provost	sent
Wisconsin	Heeger,+others	provost&VCR	sent
Yale	Fleming/McKinsey	pres or provost	sent

Letters

Institutional letters have created a stir and demonstrate that we have a base of support for.

Individual letters need to be sent essentially NOW while negotiations between NSF and DOE are happening.

Thanks to all who made this happen.

Facing Forward

- We need to develop plans for a “design to cost” LBNE experiment.
- We need to have this defined on the time scale of CD1.
- If we do this, we can be ready when site and funding issues become clear. As we heard, DOE is committed to LBNE and we need to recognize this and continue to move forward.

A DOE only scenario

- chance to revisit schedule and requirements:
- lab access for general public?
- shaft refurbishment?
- education and outreach?
- surface facilities?
- What things are really necessary to do the scientific work? Revisit requirements with full control of lab.
- potential for staging

Case Study Concept and Elements

- Develop two “design to cost” case studies for all-LAr and all-water scenarios this year.
- Collaboration work with PWG and Project Team to develop case of best science for money available
- Includes facility, beam, near detector – a complete proposal.
- Assumes Homestake site – if this becomes untenable, then Case Studies will be changed to include alternate sites.
- Realistic manpower requirements, R&D, costing.
- Reviewed and ready for input into CD next year

Design to Cost

- What is the cost we are designing to? Under discussion – agency input needed, scale ~$1B. Case study could assume other sources (e.g. FNAL R&D, other experiments, NSF), but need to be stated and taken into account in assessment of risk.
- How costs calculated? Defined by Project Manager. Risk of WC cavern, LAr detector development will be very important.
- Beam – discussion needed on how to define a cost box for the beam. Cannot design FD complex without this. Could be a few options for box.

Homestake Site

- Need to define what this is as part of the case study. Each case study will have to define what they mean by this.
- What services are assumed? E.g road access, power infrastructure, shaft conditioning, management costs.
- What are risks associated with site development?
- What are costs associated with schedule?
- This case study cannot be at CD1 level for all aspects, obviously.

What is the science?

- Science case for first phase
- Sensitivity, including assumptions on efficiencies, backgrounds, uncertainty assessment.
- Decisions made for first phase – (e.g. Gd or no Gd, muon veto or no muon veto)
- Upgradability
- Level: able to make the case to a room of skeptics

Who are the people?

- Sense of EB is that we should not split up the collaboration at this time
- Nevertheless, each case must include expected contribution from collaboration members – as would be listed in an actual "first stage" proposal.

What is the desired result?

- ~100 page document that gives summary of science, technical development, schedule, costs, and people.
- Review sponsored by SC to look at science possible at Homestake with defined TPC. Details of review TBD – but might include external panel.

What is the process?

- Still under discussion, but basically “Case Study Leaders” will lead teams to define the science case and put together the case proposal. Leaders asked by spokespeople and approved by EB.
- All collaborators are encouraged to participate – can be on both case study teams
- Time scale is summer if March 2012 is a serious CD1 date

Outcomes

- Both cases reviewed by SC and a 1st choice recommended by EB – discussion of how non-1st choice would be realized (e.g. WC or LAr offshore, second phase, etc). As always, folks vote with feet on what they want to do.
- If Homestake site becomes untenable – case studies extended to consider alternative sites.

Summary

- EB will continue to push NSB/NSF/DOE for favorable resolution of Homestake site: letters, NRC study, talking to key people.
- Keep focus on progress towards CD1 by putting together case studies for design to cost LBNE experiment
- REALISM AND OPENESS