

PEP II CIVIL D&D



Lori Plummer

SCOPE

- *Scope of the civil work includes D&D of the PEP II tunnel and associated buildings*
 - The tunnel cross-section is 12 ft x 12 ft
 - Tunnel ring is approx. 7250 ft in length
 - North and South Injection Lines are approx. 550 ft each = 1100 ft total
 - Total area of the 26 main buildings and 4 mechanical pads is approx. 115,000 ft²

SCOPE

- *Scope of the civil work includes D&D of the PEP II tunnel and associated buildings (cont.)*
 - There are 5 Overhead Cranes
 - Bldg 620, 60 Ton
 - Bldg 640, 50 Ton
 - Bldg 660, 100 Ton
 - Bldg 680, 50 Ton
 - Bldg 706, 50 Ton
 - There are an additional 35 sheds and trailers

SCOPE

- *The civil D&D is estimated to take 3 years of contractor time, with an additional year for SLAC planning and project management.*

- *The work has been separated into three phases, to allow the work to be accomplished at different times.*
 - The main portion of the tunnel may be done first, leaving the buildings for additional work space and storage.

 - When they are no longer needed, the buildings will be removed.

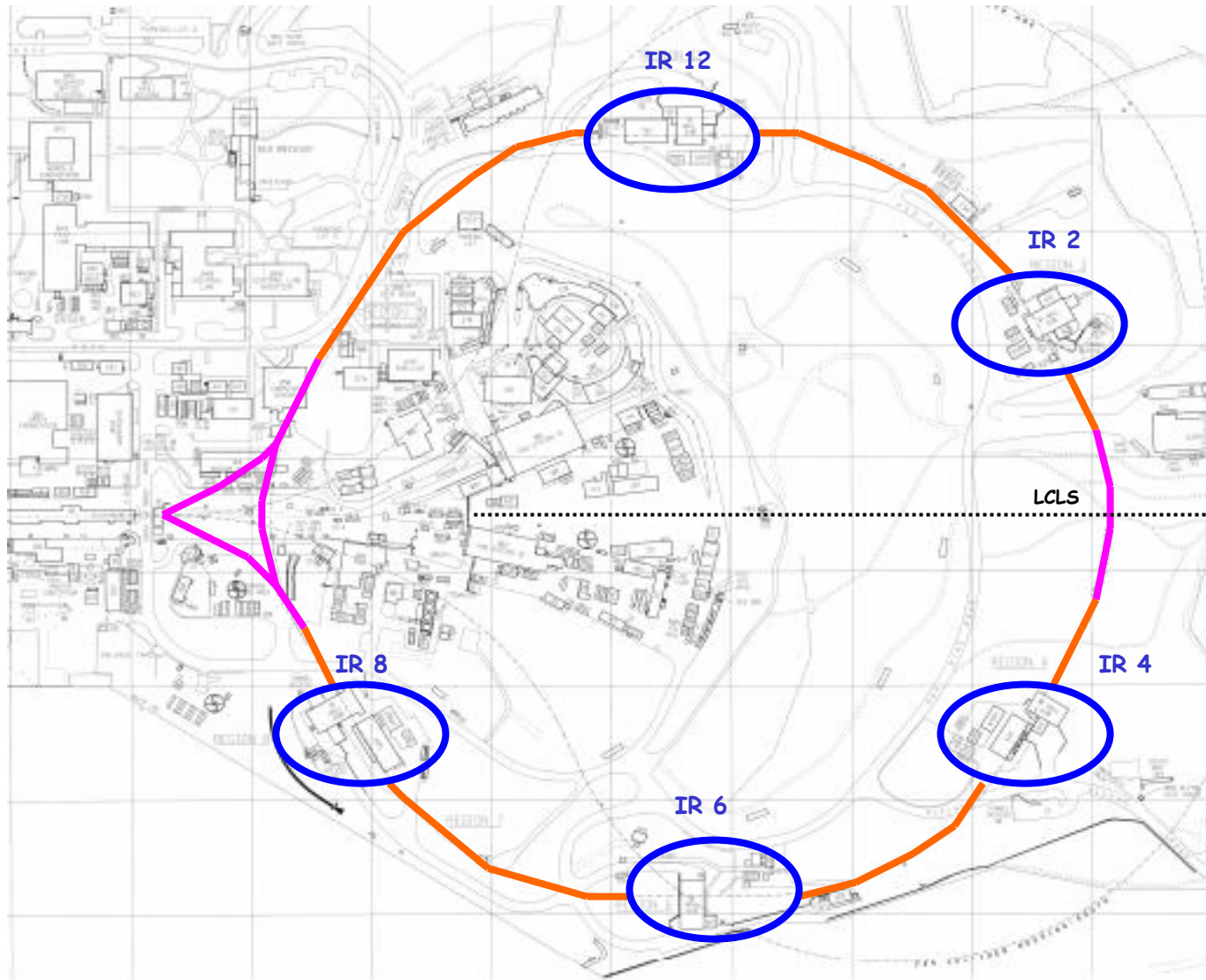
 - Portions of the tunnel are under other important structures, that will remain in use. If the PEP II tunnel is removed in these areas, additional precautions and demo plans are needed.

THREE PHASES

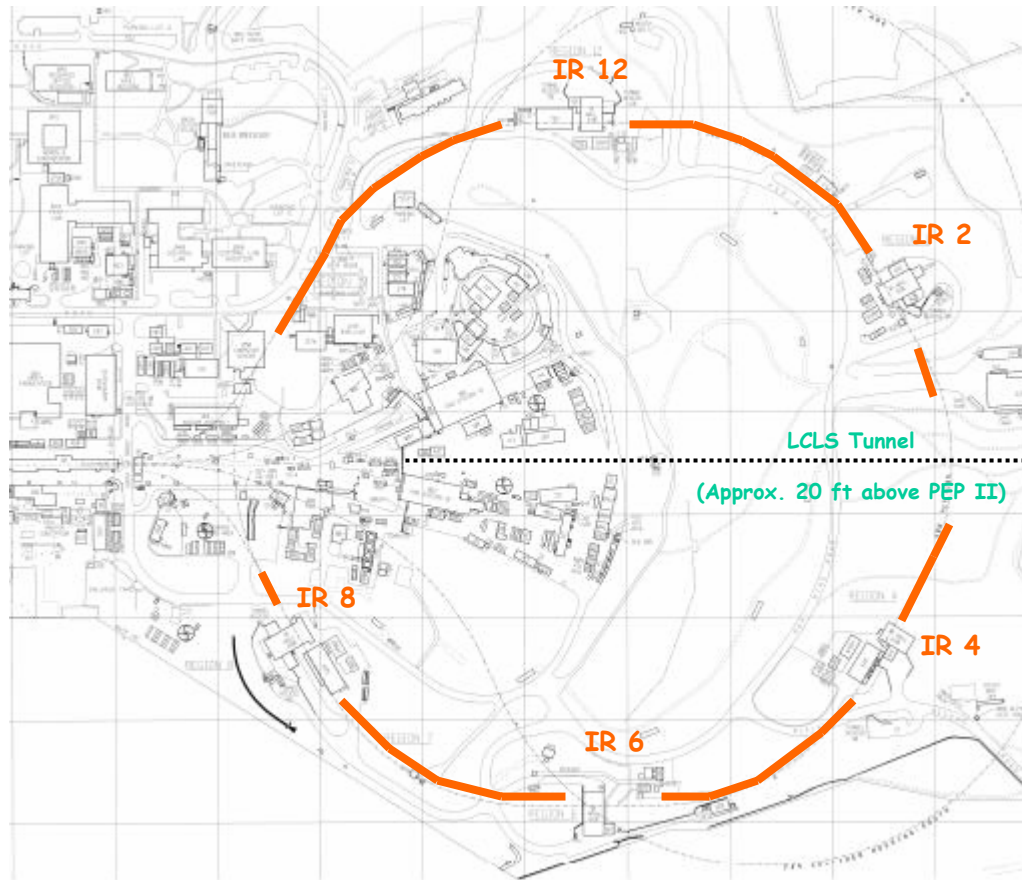
➤ *Three Phases of the Civil D&D*

- 1) Tunnel Regions 1 through 8 and 10 through 12, minus 500 ft at Region 3
- 2) Buildings, sheds and trailers + tunnel through IR Halls
- 3) Tunnel Region 9 + North and South Injection Lines + 500 ft at Region 3

THREE PHASES



PHASE ONE



➤ *Tunnel from Regions 1 through 8 and 10 through 12*

PHASE ONE

- *Bored Section of Tunnel (Regions 3-4 & 8-12)*

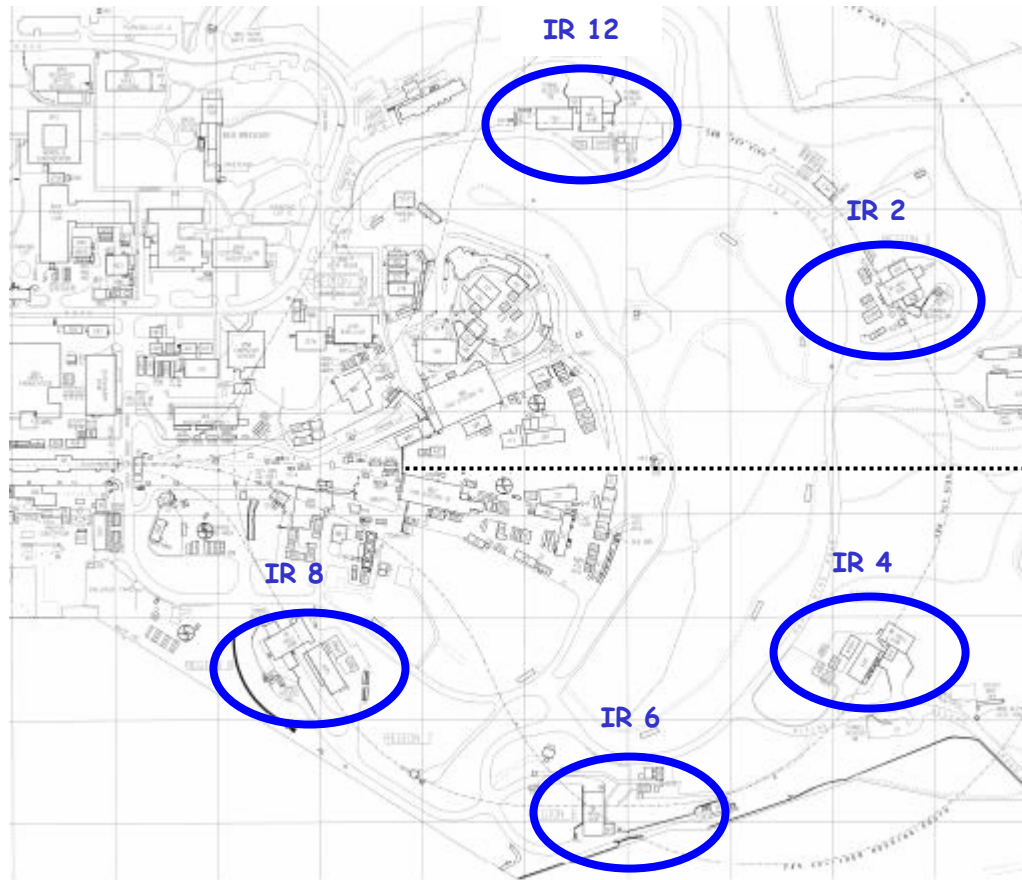


PHASE ONE

- *Cut & Cover Section of Tunnel (Regions 1-2 & 5-7)*



PHASE TWO



➤ *Buildings, Sheds and Trailers*

PHASE TWO

➤ IR 12



August 6, 2007

Civil D&D

11

PHASE TWO

➤ IR 2



PHASE TWO

➤ IR 4



PHASE TWO

➤ IR 6



August 6, 2007

Civil D&D

14

PHASE TWO

➤ IR 8

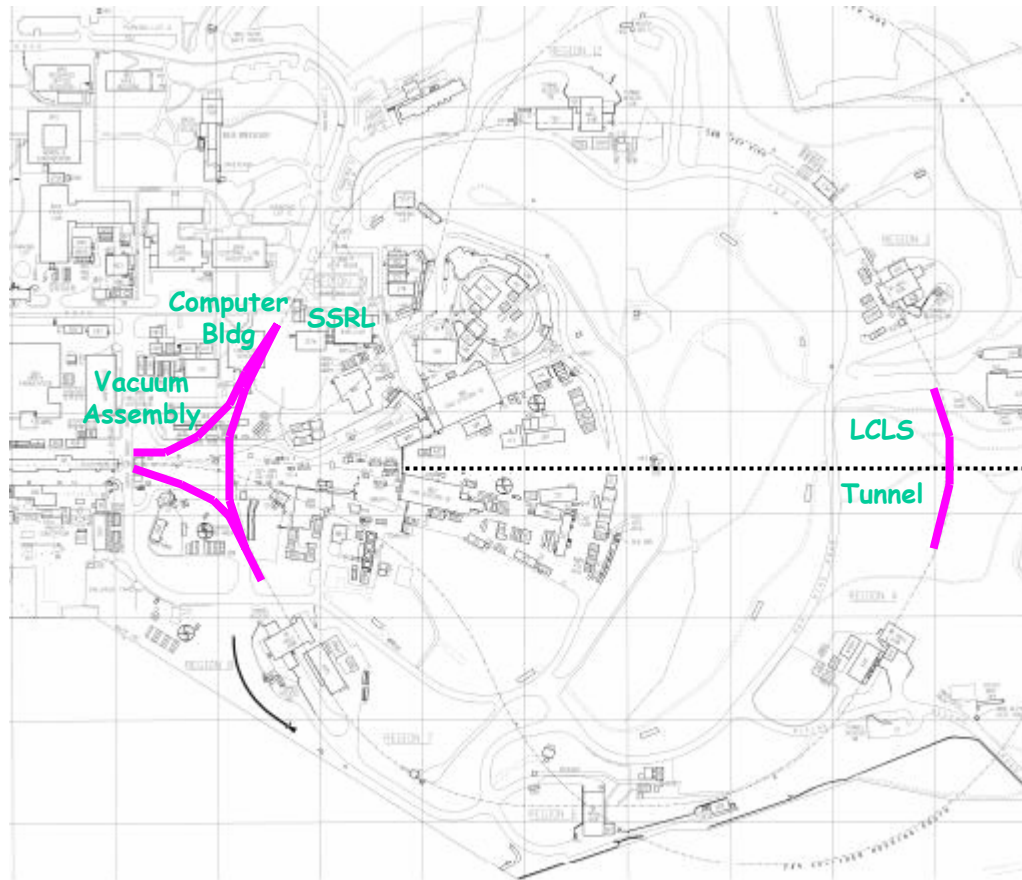


August 6, 2007

Civil D&D

15

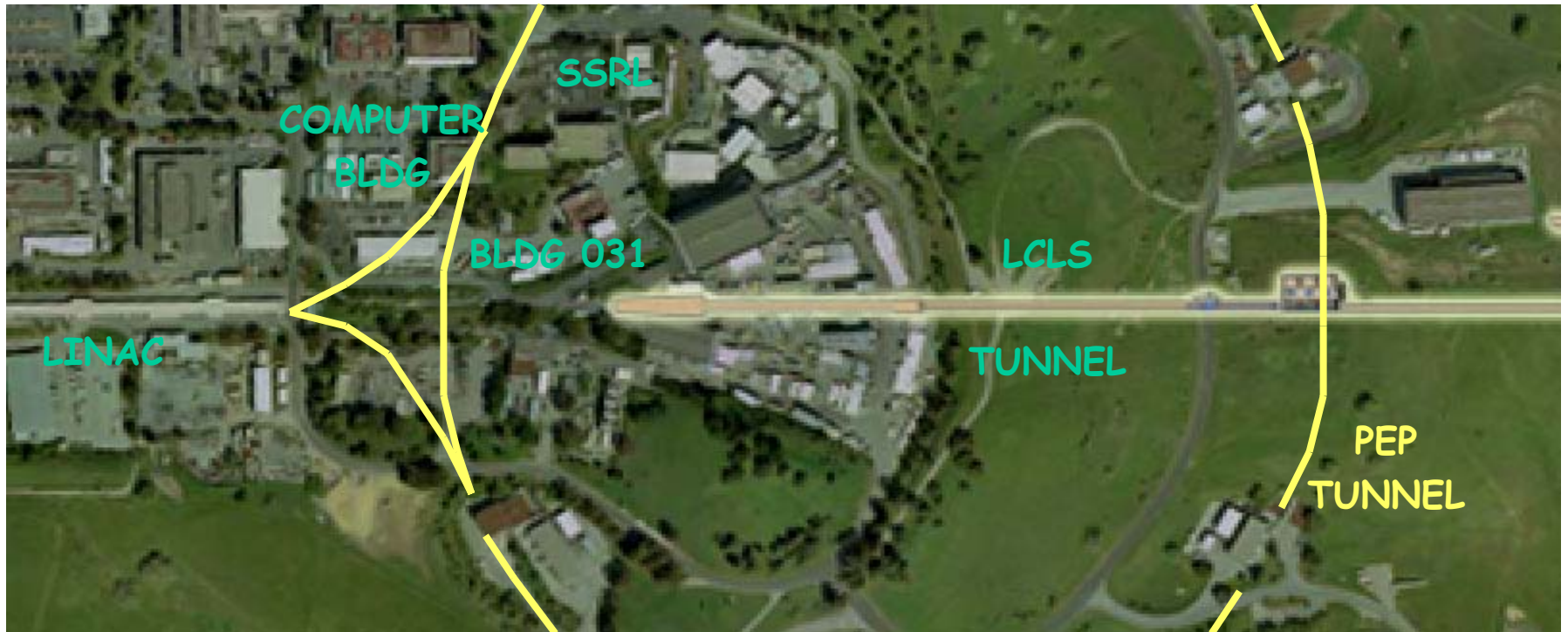
PHASE THREE



➤ *Tunnel Regions 3 & 9 + North and South Injection Lines*

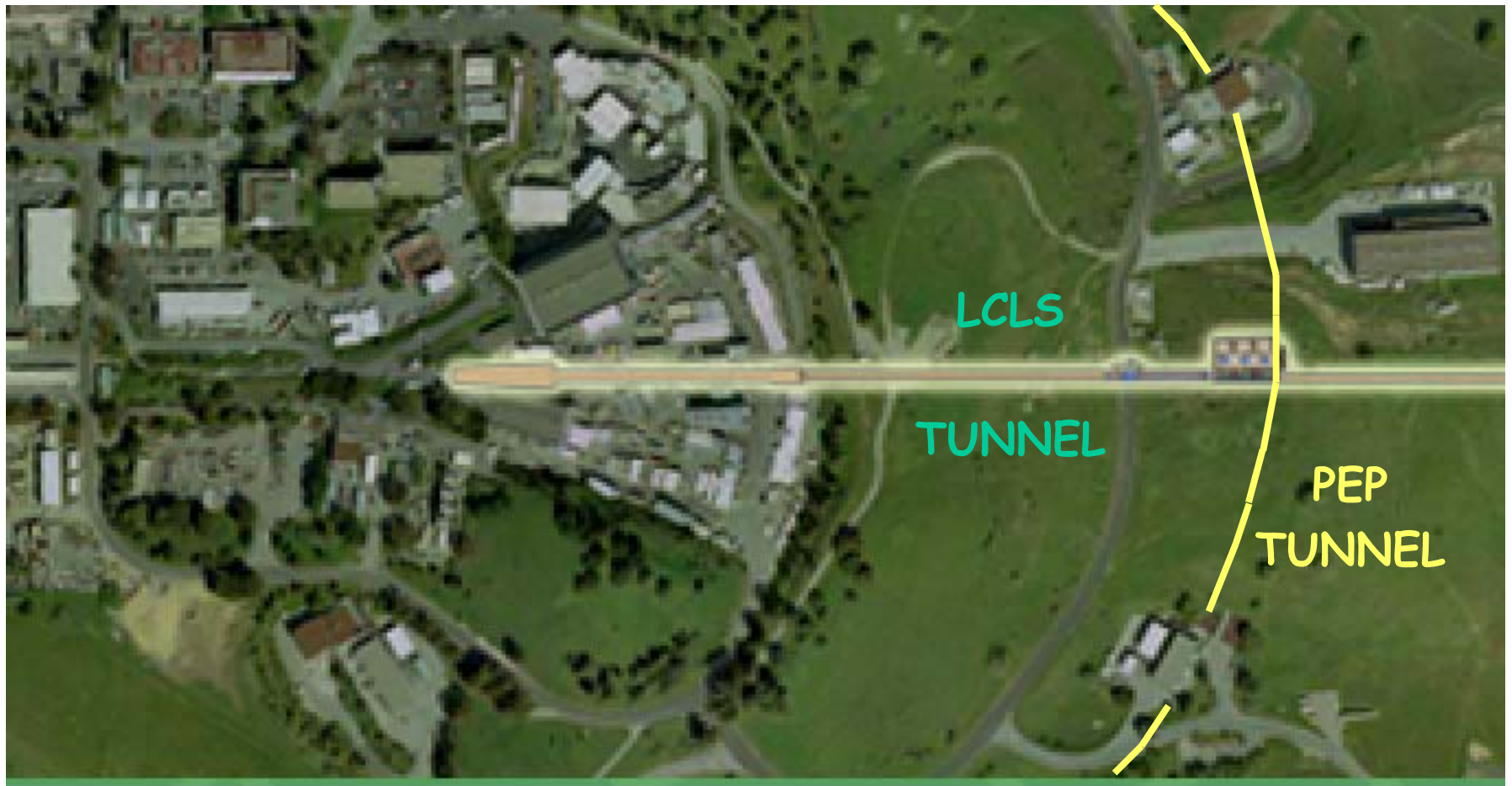
STRUCTURES TO AVOID DISTURBING

- *THESE STRUCTURES ARE NEAR THE PEP TUNNEL*



STRUCTURES TO AVOID DISTURBING

- *LCLS TUNNEL (APPROX. 20 FT ABOVE PEP TUNNEL)*



STRUCTURES TO AVOID DISTURBING

- *SSRL, Buildings 137E & 137W (APPROX. 50 FT NEXT TO PEP)*



STRUCTURES TO AVOID DISTURBING

- *Computer Building, Bldg 050 (APPROX. 45 FT ABOVE PEP)*



STRUCTURES TO AVOID DISTURBING

- *Vacuum Assembly, Building 031 (12,300 ft²)
(APPROX. 45 FT ABOVE PEP TUNNEL)*



COST ESTIMATE

➤ CEF Cost Estimate Spreadsheet

ITEM	MATERIALS & EQUIPMENT				LABOR					TOTAL
	Unit Measure	No. Units	Unit Cost	Total	No. Units	Unit Hours	Total M/Hrs	\$ Per Hour	Total	
1 Demo and disposal - Buildings, Sheds, Trailers (5 Regions)	ea	5	1300000	\$6,500,000	23	700	16100	95	1,529,500	8,029,500
2 Demo and disposal - tunnel Regions 1-8 & 10-12 (minus 500 ft of Region 3)	ea	5850	4100	\$23,985,000	23	2700	62100	95	5,899,500	29,884,500
3 Fill (new soil) - tunnel Regions 1-8 & 10-12 (minus 500 ft of Region 3)	ea	5850	1000	\$5,850,000	23	700	16100	95	1,529,500	7,379,500
4 Demo and disposal - tunnel Region 9 + "N" & "S" Lines + 500 ft of Region 3	ea	2500	6000	\$15,000,000	23	1300	29900	95	2,840,500	17,840,500
5 Fill (new soil) - tunnel Region 9 + "N" & "S" Lines + 500 ft of Region 3	ea	2500	2800	\$7,000,000	23	800	18400	95	1,748,000	8,748,000
6 Existing Underground Utilities-Address Conflicts	ea	1	7000000	\$7,000,000			0		0	7,000,000
7	ea			\$0			0		0	0
8 Mobilization @\$100,000 per	ea	10	100000	\$1,000,000			0		0	1,000,000
9	ea			\$0			0		0	0
10 Radiation Waste Containers/Loading (excavate, stockpile & re-load)	ea	1	8000000	\$8,000,000			0		0	8,000,000
11				\$0			0		0	0
12				\$0			0		0	0
13				\$0			0		0	0
14				\$0			0		0	0
15				\$0			0		0	0
MATERIAL & EQUIPMENT TOTAL				\$74,335,000	LABOR M/HR TOTAL			142600	13,547,000	87,882,000

	CONSTRUCTION	87,882,000
15%	GENERAL CONDITION	13,182,300
15%	OVERHEAD & PROFIT	13,182,300
	CONSTRUCTION PROCUREMENT	114,246,600
	ED&I	2,257,600
	INDIRECT	928,240
	ES&H	73,200
50.00%	CONTINGENCY	58,752,820
	TEC	\$176,258,460

COST ESTIMATE

➤ CEF Cost Estimate Spreadsheet

ED&I CALCULATOR

	ITEM	LABOR				TOTAL
		No. Units	Unit Hours	Total M/Hrs	\$ Per Hour	
1	Engineering/Project Management	1	1600	1600	85	136,000
2	Drawings	1		0	70	0
3	UTR	4	6240	24960	85	2,121,600
4	Earthquake Safety	1		0	85	0
5	Permits	1		0	85	0
6				0		0
7				0		0
8				0		0
9				0		0
10				0		0
ED&I TOTAL						\$2,257,600

INDIRECT CALCULATOR

LABOR IN DOLLARS	
SLAC Labor	\$2,257,600
Davis-Bacon Labor	
PURCHASED ITEMS / SUBCONTRACTS	
TOTAL Dollar Value of Requisitions (Each less than \$500,000)	
Number of Requisitions Greater than \$500,000	1
TOTAL INDIRECTS	\$928,240

Indirect Purchase 5.04%
Indirect Labor 40.0%

ES&H ESTIMATE

	ITEM	MATERIALS				LABOR					TOTAL
		Unit Meas.	No. Units	Unit Cost	TOTAL	No. Units	Unit Hours	TOTAL M/HR	\$ PER HOUR	TOTAL	
1	Sampling	ea			\$0	4.00	150.00	600	\$85	\$51,000	\$51,000
2	Permits		1.00	\$10,000	\$10,000			0		\$0	\$10,000
3	Disposal*				\$0			0		\$0	\$0
4	Containment				\$0			0		\$0	\$0
5					\$0			0		\$0	\$0
6	* Based on Class II disposal				\$0			0		\$0	\$0
7					\$0			0		\$0	\$0
ES&H Subtotal										\$61,000	
20.00%										ES&H Contingency	\$12,200
ES&H TOTAL										\$73,200	

COST ESTIMATE - METHOD

- *PARAMETRIC AND ANALOGOUS (using existing parameters and based on past experience)*
 - FERMA Corporation provided the preliminary estimate.
 - Used due to the scope of the work and the percentage of costs from heavy equipment.
 - The Material & Equipment Costs are 80% of total.
 - The Labor Costs are approx. 20% of total.

COST ESTIMATE - ADJUSTMENTS

➤ ***GENERAL CONDITION***

- 15%, includes cost to address SLAC safety policies, payroll certification required by Davis-Bacon etc.

➤ ***OVERHEAD & PROFIT***

- 15%, contractor's profit & overhead

➤ ***CONTINGENCY***

- Initiating Process value of 50%

COST ESTIMATE - BREAKDOWN

➤ PHASE ONE

- (2/3) of Items # 2 & 3 = Approx. 35%

➤ PHASE TWO

- Item # 1 + (1/3) of Items # 2 & 3 = Approx. 30%

➤ PHASE THREE

- Items # 4 & 5 = Approx. 35%

DISCUSSION ITEMS

➤ *Items for further study*

- 1) Options for D&D of tunnel in the Phase Three regions.
 - a. Remove tunnel without disturbing the structures above it. A detailed demolition plan is needed.
 - b. Leave existing tunnel structure and fill.
 - c. Leave existing tunnel structure and install walls to block access.
- 2) Decide if all three Phases of work will be accomplished at the same time, or if they will be done separately.
- 3) Update costs for Radiation waste packaging and loading, using results from Radiation Sampling Analysis Plan, Characterization and Release criteria.
- 4) Test for potential hazardous materials, to determine if the existing soil can be reused on site.
- 5) Test for potential hazardous materials, to determine if the existing concrete can be crushed to $\frac{3}{4}$ " base rock for on site reuse.