

# PXIE RLS

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August 31<sup>st</sup> 2012

# PXIE RLS

Funding profile used:

PXIE Available Funding Sources (Loaded, M\$)						
	FY13	FY14	FY15	FY16	FY17	FY18
PX - 120A	7.0	7.0	8.0	9.0	9.0	9.0
SRF - 18	6.5	6.5	6.5	6.5	6.5	6.5
Total	13.5	13.5	14.5	15.5	15.5	15.5

Notes:

No ILC funding available

Loaded values: M&S 20.39%, Labor 98.0%

# PXIE RLS

<b>Funding Split</b>	
<b>SRF Tasks</b>	<b>PX Tasks</b>
<b>1. HWR (ANL)</b>	<b>1. Project Management</b>
<b>2. SSR1</b>	<b>2. Commissioning</b>
<b>3. Main LCW Skid</b>	<b>3. Ion Source</b>
<b>4. Cryogenics</b>	<b>4. LEBT</b>
<b>5. Cold Supports</b>	<b>5. RFQ (LBNL)</b>
<b>6. Cold Installation</b>	<b>6. MEBT</b>
<b>7. Cold Instrumentation</b>	<b>7. Warm RF Power</b>
<b>8. Cold RF Power</b>	<b>8. RAW Skid</b>
<b>9. Cave &amp; Utilities</b>	<b>9. Temporary LCW</b>
<b>10. % Controls</b>	<b>10. Personnel and MPS</b>
	<b>11. Warm Instrumentation</b>
	<b>12. LLRF</b>
	<b>13. Warm Support Structures</b>
	<b>14. Warm Installation</b>
	<b>15. Vacuum</b>
	<b>16. % Controls</b>

# PXIE RLS

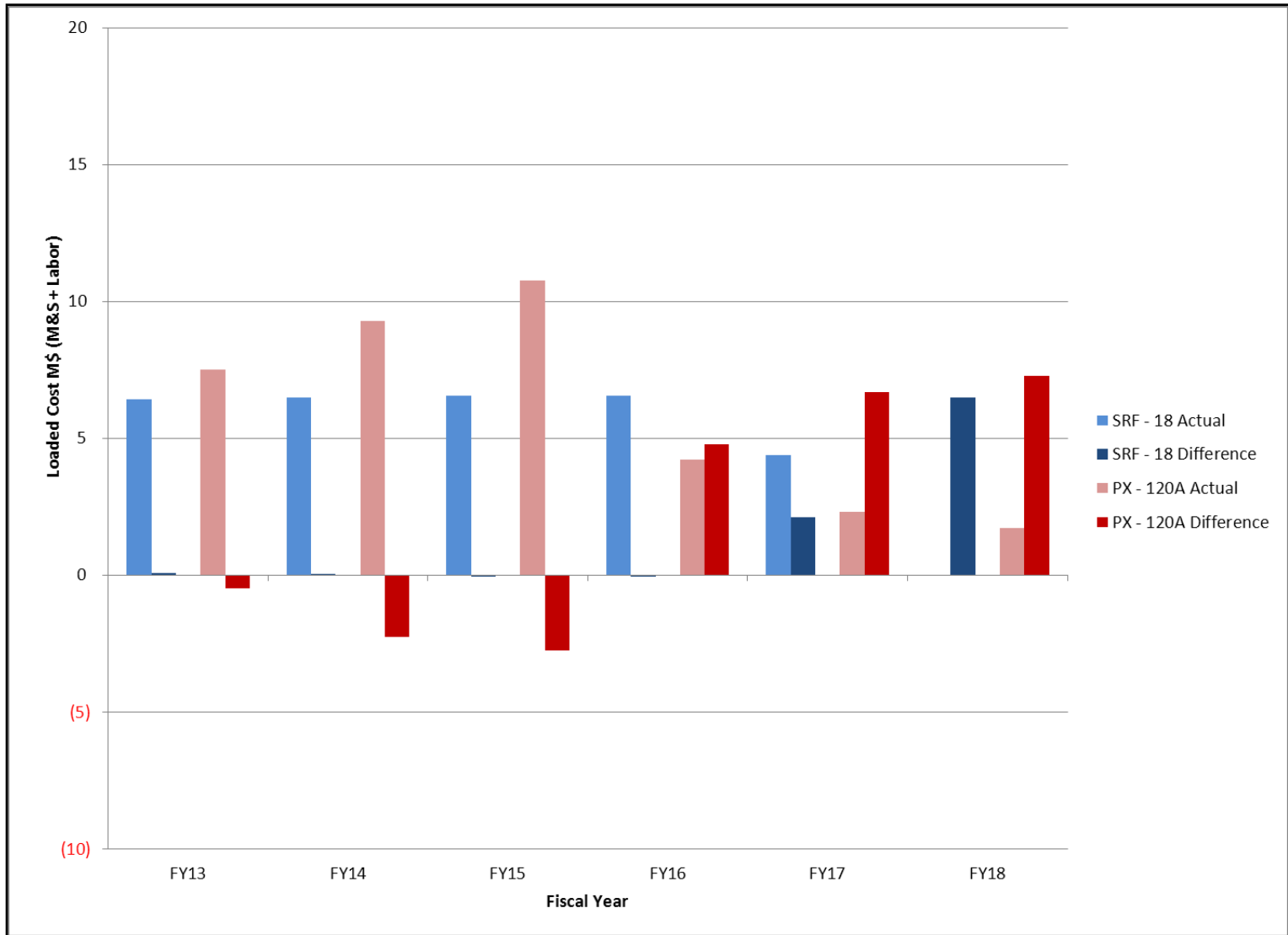
## ■ Staged Schedule Outline:

- Stage 1:
  - Ion Source & LEBT (With Switching Magnet, Chopper & Instrumentation)
  - RFQ
  - MEBT with single cavity and single kicker and absorber
  - 2 MeV diagnostics
  - 3 kW beam dump (HINS)
  - Cryogenic System
  - SSR1 Cryomodule full power RF test with no beam
- Stage 2:
  - HWR Cryomodule full power RF test with no beam
- Stage 3:
  - Complete full MEBT
  - 50 kW beam dump
  - HWR tested in-situ with beam
- Stage 4:
  - SSR1 tested in-situ with beam

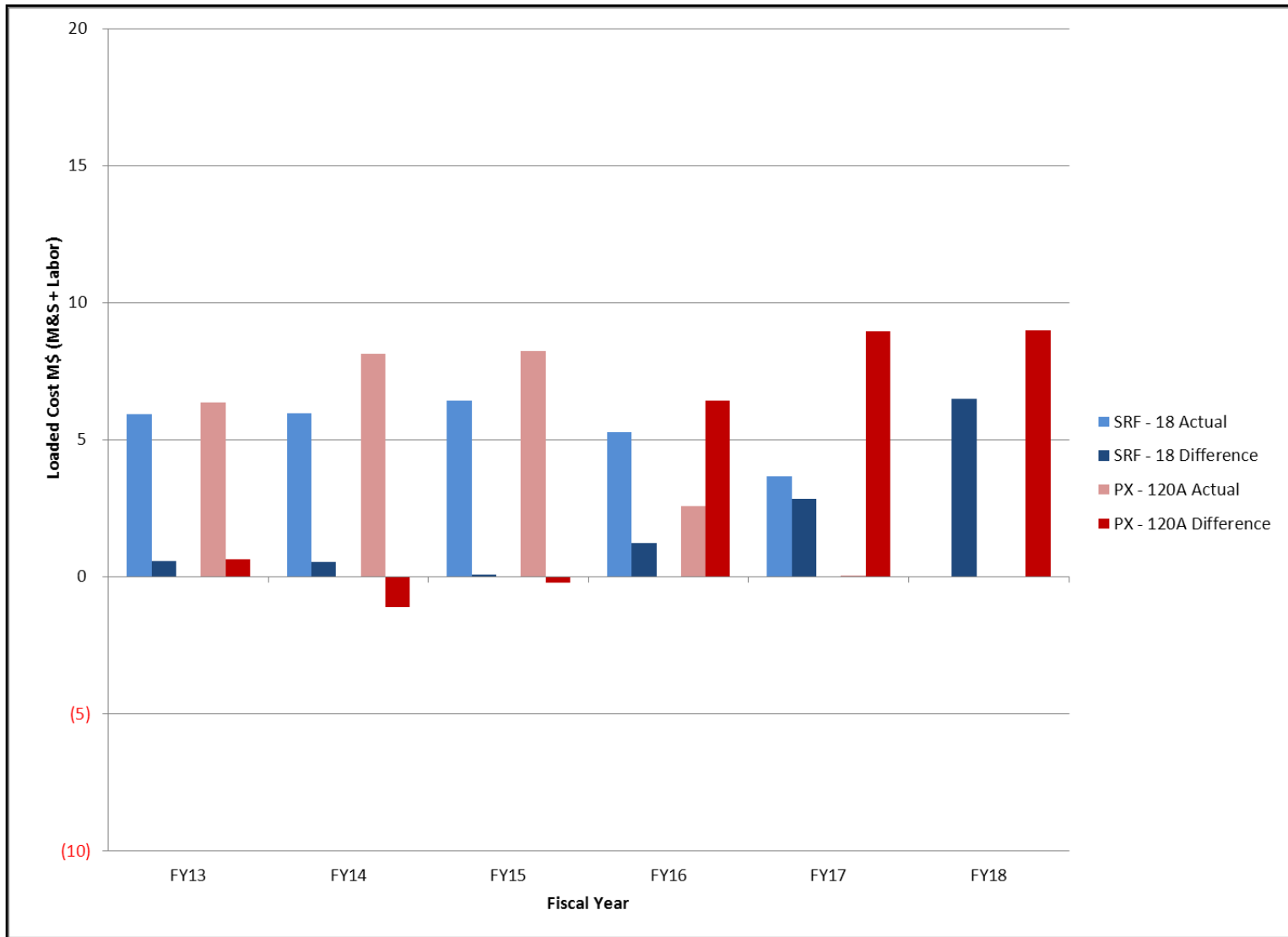
# PXIE RLS – ALL STAGES

WBS CATEGORY:		FISCAL YEAR COST: (\$M / FTE)												
		FY13		FY14		FY15		FY16		FY17		FY18		
		PX	SRF	PX	SRF	PX	SRF	PX	SRF	PX	SRF	PX	SRF	
120A.02.01 CW Linac Project Management	M&S													
	Labor	1.50		1.50		1.50		1.50		1.50				
120A.02.02 CW Linac Accelerator Physics	M&S													
	Labor	0.57		0.57		0.57		0.57		0.57				
120A.02.03 CW Linac Front End	M&S	1.39		2.66		1.84								
	Labor	10.93		7.86		4.93		0.79						
120A.02.04 325 MHz System	M&S		0.41		0.64		0.45		1.77					
	Labor		7.64		2.64		2.71		1.93		4.50			
120A.02.06 CW Linac Test Facility Infrastructure	M&S	0.07	0.35	0.12	1.57	0.13	1.24	0.30						
	Labor	0.86	4.86	0.29	5.21	2.93	8.86	1.14	3.36	0.50				
120A.02.07 CW Linac Instrumentation	M&S	0.14	0.05		0.14	0.79		0.02						
	Labor	3.21	0.57		0.50	6.29		1.43						
120A.02.08 CW Linac LLRF	M&S			0.20		0.11		0.08						
	Labor			5.07		4.21		1.29						
120A.02.09 CW Linac Controls	M&S	0.12	0.02	0.14	0.14				0.04					
	Labor	0.43	0.14	3.29	0.07	1.36	0.14		0.57					
120A.02.11 CW Linac Mechanical Support Systems	M&S	0.23	0.01	0.01		0.20		0.30	0.16					
	Labor	1.07	1.29	0.86	0.36	0.57		0.79						
120A.02.12 162.5 MHz System	M&S		1.52		1.52		1.52		2.39		3.15			
	Labor		0.14		0.14		0.36		0.14					
120A.02.13 CW Linac Beam Delivery	M&S											1.40		
	Labor									3.43		0.79		
120A.02.14 CW Linac Installation	M&S	0.30		0.60		0.60		0.06		0.06				
	Labor	0.29		0.50		2.93		2.79	1.86	0.21	4.50			
	(\$M)	M&S	2.25	2.37	3.75	4.02	3.68	3.21	0.77	4.35	0.06	3.15	1.40	0.00
	(FTE)	Labor	18.86	14.64	19.93	8.93	25.29	12.07	10.29	7.86	6.21	9.00	0.79	0.00

# PXIE RLS – ALL STAGES



# PXIE RLS – STAGE 1



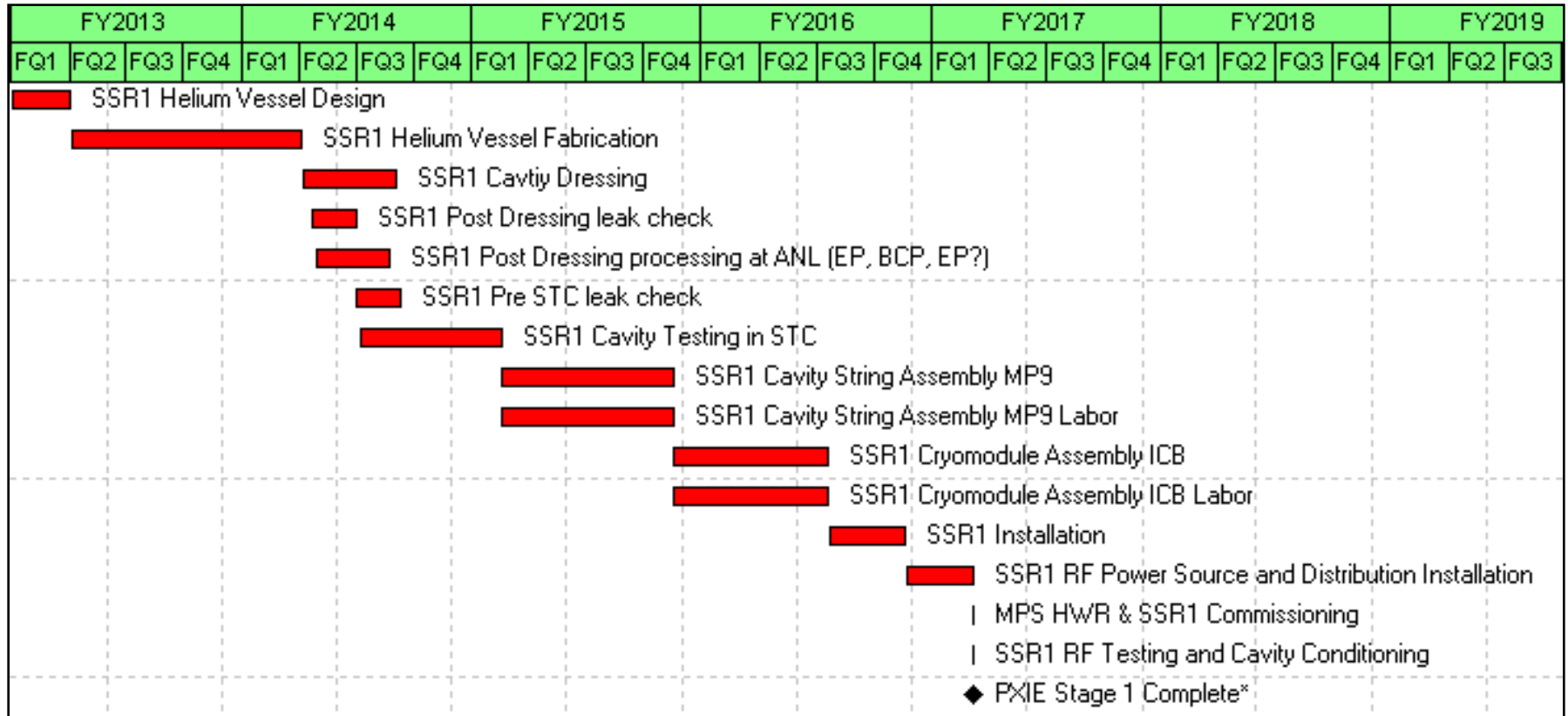
# PXIE RLS – STAGE 1

## PXIE Stage 1 Chart Description:

- This profile keeps PX and SRF funding independent.
- The full LEBT is included in both funding scenarios, which includes the LEBT chopper and LEBT bending magnet.
- Includes only Stage 1 components and HWR funding to ANL at \$1.5M through FY16 and \$3.1M in FY17.
- Includes HINS equipment with loaded cost savings to PXIE of ~\$3.6M for Stage 1 M&S and SWF (direct – \$1.4M M&S and \$1.1M SWF).
- Still need to distribute some PX FY14 tasks to fit the funding profile.



# PXIE RLS – STAGE 1



# PXIE RLS – STAGE 1

FY2013				FY2014				FY2015				FY2016				FY2017				FY2018			
FQ1	FQ2	FQ3	FQ4	FQ1	FQ2	FQ3	FQ4	FQ1	FQ2	FQ3	FQ4	FQ1	FQ2	FQ3	FQ4	FQ1	FQ2	FQ3	FQ4	FQ1	FQ2	FQ3	FQ4
<ul style="list-style-type: none"> <li>◆ RFQ Design &amp; Analysis Complete*</li> <li>◆ LEBT Emittance Station Sensor One Delivery From SNS</li> <li>◆ MEBT Chopper R&amp;D 50 Ohm Kicker 25% Complete (1 Kicker)               <ul style="list-style-type: none"> <li>◆ HWR Solenoid Prototype and BPM Prototype Testing Complete</li> <li>◆ Ion Source Delivered to FNAL*                   <ul style="list-style-type: none"> <li>◆ HWR Fabrication Drawings Complete* (Q2FY13)</li> <li>◆ HWR Cryostat Vessel Procurements Completed* (Q2FY13)</li> <li>◆ HWR Cavity with SS Vessel Prototype Complete* (Q2FY13)                       <ul style="list-style-type: none"> <li>◆ MEBT Absorber Prototype Testing Completed                           <ul style="list-style-type: none"> <li>◆ Approval for Beam Through the RFQ</li> <li>◆ LEBT Emittance Station Sensor Two Delivery From SNS                               <ul style="list-style-type: none"> <li>◆ HWR Solenoid Assembly with BPM                                   <ul style="list-style-type: none"> <li>◆ HWR Prototype Cavity Test Complete* (Q4FY13)</li> <li>◆ LLRF Digital Controller Conceptual Design</li> <li>◆ HWR Solenoid and BPM Combination Testing</li> <li>◆ MEBT Chopper Technology Chosen*                                       <ul style="list-style-type: none"> <li>◆ HWR Solenoid and BPM Final Fabrication   <ul style="list-style-type: none"> <li>◆ HWR Solenoid and BPM Installation into Cryomodule   <ul style="list-style-type: none"> <li>◆ RFQ Delivery to FNAL*</li> <li>◆ HWR Cryostat Vessel Fabrication Complete* (Q2FY14)</li> <li>◆ Ion Source Beam Commissioning Complete*</li> </ul> </li> <li>◆ MEBT Absorber Final Design Completed &amp; Review   <ul style="list-style-type: none"> <li>◆ HWR Production Cavities Fabrication Complete* (Q4FY14)</li> <li>◆ RFQ End Plate Design (interface to MEBT and interface to LEBT)   <ul style="list-style-type: none"> <li>◆ Beam through the LEBT*</li> <li>◆ LEBT Beam Commissioning Complete*</li> </ul> </li> <li>◆ HWR Mock-up Cavity String Assembly Complete* (Q2FY15)   <ul style="list-style-type: none"> <li>◆ MEBT Absorber Assembled   <ul style="list-style-type: none"> <li>◆ Beam through the RFQ*</li> <li>◆ RFQ Beam Commissioning Complete*</li> <li>◆ HWR Cryomodule Off-Line Testing Complete* (Q4FY15)   <ul style="list-style-type: none"> <li>◆ HWR Cryomodule Ready for Installation* (Q2FY16)   <ul style="list-style-type: none"> <li>◆ Beam through the MEBT*</li> <li>◆ MEBT Beam Commissioning Complete*</li> </ul> </li> </ul> </li> </ul> </li> </ul> </li> </ul> </li> </ul> </li> </ul> </li> </ul> </li> <li>◆ PXIE Stage 1 Complete*</li> </ul> </li></ul></li></ul></li></ul></li></ul></li></ul>																							

# PXIE RLS – CONCLUSIONS

- The funding appears to be available to make progress on all PXIE tasks prioritized by management for FY13.
- In the total funding profile, there will have to be decisions made regarding the PX deficit in FY14 and FY15 as there does not appear to be anything that can be delayed without impacting the Stage 1 end date.
- There is still work to be done incorporating updates as things seem to change weekly, but this RLS gives the project a great baseline to plan from.