

Input value

Calculated

\*\*\* Stable, well understood parameter

\*\* Reasonably well defined parameter

\* Rough estimate

Parameter	Value	Units	Quality	Req ID	Notes
V plane bias voltage	0	V	***		Adjust to achieve transparency. Doc #2833
Collection plane bias voltage	700	V	***		Adjust to collect electrons. Doc #2833
Cryogenics					
Num recirculation pumps	4		**	<a href="#">FR.Phys.LAr Oper</a>	Provides redundancy during operation. None during initial purification
Recirculation pump flowrate	47,000	kg/hr	**	<a href="#">FR.Det.LAr Purity</a>	
	34	m <sup>3</sup> /hr			
	150	gpm			
Recirculation pump flowrate - max	188,000	kg/hr			
	136	m <sup>3</sup> /hr			
	598	gpm			
LAr volume turnover @ max flowrate	5	days			
Pump power	6	kW			Assumes 30m (60 psi) head pressure
Pump power - max	24	kW			Assumes 30m (60 psi) head pressure
Refrigeration load	49	kW			
Refrigeration load - max	67	kW			
Num refrigeration plants	2				One operating and one standby
Refrigeration plant capacity	59	kW	**		From Arup concept report
Refrigeration plant capacity - max	118	kW	**		Both plants in operation
Refrigeration plant margin	18%				
Refrigeration plant power input	560	kW	**		From Arup concept report
Refrigeration plant heat output	140	kW	**		From Arup concept report
LN2 storage dewar capacity	50	m <sup>3</sup>	**	<a href="#">FR.Phys.LAr Oper</a>	Sized to fit on available hardstand area at South Portal
LN2 consumption rate	1.2	m <sup>3</sup> /hr	**		Assume continued operation w electronics on
LN2 storage dewar backup capacity	41	hrs			
Detector Depth					
Detector Depth	800	ft	***	<a href="#">FR.Phys.LAr PDK.CRBG</a>	<a href="#">Similar depth as that used in Bueno study for GLACIER concept</a>
	240	m			
Rock formation	Ellison? Northwestern?		*		
Rock density	2.82	g/cm <sup>3</sup>	***		doc #916. Have been told that 2.9 g/cm <sup>3</sup> is the "correct value"
Cosmic ray fluence	2.67E-06	Hz/cm <sup>2</sup> -sr	***		<a href="#">Measured CR rate - doc #2625</a>
Cosmic ray rate	0.042	Hz/m <sup>2</sup>	**		<a href="#">CR angular dependence - doc #895</a>
Cosmic ray rate - detector top	45	Hz			
Cosmic ray rate - APA top	0.5	Hz			
Radioactive Backgrounds					
Estimated Ar39 decay rate	1	Hz/kg	**		NIM A574 , 83 (2007)
Average Ar39 decay energy	200	keV	**		NIM A574 , 83 (2007)
APA cell Ar39 decay rate	119	kHz			