

NUMI Project Level 3 Milestones (for use with April 2004 Month				
<i>*Note: Unless otherwise indicated, float is in months until milestone become</i>				
Technical Component Milestones for next period				
WBS	L3 Milestone Number	Name	Definition	FNAL Current Projection
1.1.1	L-3-331	Kicker magnet construction complete	Kicker magnet and beam tube construction and assembly are complete. Magnets are ready for testing.	12/23/03
1.1.1	L-3-329	MI & Stub magnets installed and terminated in tunnel. Ready for low power testing after connection to power supply.	EPB and 3Q120 magnets are installed, rough aligned and power connections made. Does not include B2 magnets, klixon or LCW connections.	11/3/03
1.1.1	L-3-330	Low power test of MI magnets started	EPB and 3Q120 magnets in the extraction region are tested at low power to evaluate the effect on the Recycler.	4/1/04

WBS	L3 Milestone Number	Name	Definition	FNAL Current Projection
1.1.1	L-3-271	Target Interface Baffle/Window Ready for Install	Fabrication complete and vacuum tested.	7/30/04
1.1.1	L-3-230	Kicker Ready to Install	The NuMI pulsed kicker magnets provide fast extraction of the Main injector beam into the NuMI beamline. This milestone refers to completion of installation preparations for these magnets, including magnet assembly, power and vacuum testing, and alignment referencing. Completion of the milestone means notification by the responsible NuMI Level 3 manager that such preparations are complete.	5/28/04
1.1.1	L-3-252	Instrumentation Ready for Installation	Fabrication, bench checkout and alignment referencing complete.	6/15/04
1.1.2	L-3-216	Assembly of Horn 2 Module Complete	This assembly consists of support ears and horn attachment fittings being attached to the module main-frame. (Does not include attachment of horn). Completion of this milestone will consist of notification by the responsible NuMI Level 3 manager that such an assembly has been done.	11/4/03

WBS	L3 Milestone Number	Name	Definition	FNAL Current Projection
1.1.2	L-3-212	Final Assembly of Horn 1 and Module Complete	This assembly consists of attachment of Horn 1 to its module, including test fitting of water and electric lines through the module to the horn. (The horn will be dismantled later for transport to target hall). Completion of this milestone will mean notification by the responsible NuMI Level 3 manager that such an assembly has been done.	3/15/04
1.1.2	L-3-310	Install Bottom Shielding Complete	Bottom and side wall steel shielding in place, including topout steel which forms ledge for T-blokcs ro rest on, and including air labyrinth steel. Does not include upstream shield wall to pretarget.	3/15/04
1.1.2	L-3-235	Assembly of Target/Baffle Module Complete	This assembly consists of support ears, main shafts, cams, and motors being attached to the module main-frame. The assembly is ready for attachment to the motor controllers for testing and calibration. (Does not include attachment of target/baffle carrier). Completion of this milestone will consist of notification by the responsible NuMI Level 3 manager that such an assembly has been done.	3/1/04

WBS	L3 Milestone Number	Name	Definition	FNAL Current Projection
1.1.2	L-3-308	Final Assembly of Horn 2 and Module Complete	This assembly consists of attachment of Horn 2 to its module, including test fitting of water and electric lines through the module to the horn. (The horn will be dismantled later for transport to target hall). Completion of this milestone will consist of notification by the responsible NuMI Level 3 manager that such an assembly has been done.	2/27/04
1.1.3	L-3-195	Kicker Power Supply Construction Complete	The beam extraction pulsed kicker magnets require a special power supply design to match the NuMI kicker specifications. This milestone consists of connection of the charging power supply to its pulse forming network and thyrotron tube. Completion of this milestone will mean notification by the appropriate NuMI Level 3 manager that such connections have occurred.	2/27/04

WBS	L3 Milestone Number	Name	Definition	FNAL Current Projection
1.1.3	L-3-199	Complete Installation of Horn Power Supply in PS Room	The horn power supply consists of two charging power supplies, SCR switches and capacitor bank. This milestone consists of moving the constructed power supply system from MI-8 service building to its underground support room, including internal reconnections. Completion of this milestone will mean notification by the appropriate NuMI Level 3 manager that such installation has occurred.	6/11/04
1.1.3	L-3-320	Receipt of all Transmission Line Materials & Parts	All horn transmission line components are on-site and ready for installation.	5/28/04
1.1.3	L-3-250	Power Supply Refurbishing Complete	The NuMI beamline reuses existing 500 kW power supplies. Necessary refurbishing of these supplies includes replacing/upgrading voltage regulators, SCR switches, 5V and 15V power supplies, and other miscellaneous cables and parts. Completion of this milestone will mean notification by the responsible NuMI Level 3 manager that this reconditioning has been completed for the NuMI 500 kW power supplies.	4/26/04

WBS	L3 Milestone Number	Name	Definition	FNAL Current Projection
1.1.4	L-3-210	Start of Upstream Vacuum Endcap Installation	The end cap for the upstream end of the vacuum decay pipe will be welded in place before the Target Hall shielding and cooling air labyrinth block access to that location. This milestone is accomplished when the welding starts for the joint between end cap and vacuum decay pipe. Completion of this milestone means notification by the appropriate NuMI Level 3 Manager that this welding has begun.	11/10/03
1.1.5	L-3-213	Muon Monitors Ready for Installation	The NuMI Muon Monitoring System consists of 27 tubes to be mounted in the 3 muon monitoring alcoves. This milestone refers to fabrication, testing and calibration of the 27 tubes, along with support structures, high voltage and signal cables, readout electronics, and HV power supplies.	12/23/03

WBS	L3 Milestone Number	Name	Definition	FNAL Current Projection
1.1.5	L-3-217	Downstream Hadron Monitor Ready for Installation	The NuMI Hadron Monitor is housed in a rail-mounted 1m x 1m aluminum box which will be mounted to the concrete shielding blocks between the downstream decay pipe window and the hadron absorber. This milestone refers to fabrication and testing of the hadron monitor, along with high voltage and signal cables, readout electronics, and HV power supplies. Completion of this milestone means notification by the appropriate NuMI level 3 manager that the components have been delivered to Fermilab.	5/27/04

WBS	L3 Milestone Number	Name	Definition	FNAL Current Projection
1.1.8	L-3-234	Fiber Optic Cable Installation Complete	NuMI fiber optic cable that installation consists of 36 multimode fiber trunk cable for controls and 24 singlemode fiber trunk cable for networking. This milestone means connections between : MI-62 SB to MI-65 SB; MI-65 SB to Target Hall Support Room; MiniBooNE Detector Bldg to MINOS SB; MINOS SB to Near Detector Hall; and Near Detector Hall to Upstream End of Absorber Access Tunnel. This milestone does not include terminations. Completion of this milestone means notification by the NuMI Project Engineers that such connections have occurred.	3/10/04
SB&O Civil Construction Milestones				
WBS	L3 Milestone Number	Name	Definition	FNAL Current Projection

WBS	L3 Milestone Number	Name	Definition	FNAL Current Projection
1.2.4	L-3-211	MSB Complete	Completion of contractually specified items including, but not limited to, structural, mechanical, electrical, and fire protection systems. Completion of this milestone means notification by the SB&O subcontractor that contractual milestone MS8 has been met.	3/10/04
1.2.4	L-3-218	Beneficial Occupancy of Minos Shaft, Absorber, Minos Access Tunnel, and Minos Hall	Occupancy, with completion of contractually specified items, of Minos Shaft, Absorber, Minos Access Tunnel, and Minos Hall. Completion of this milestone means notification by the SB&O subcontractor that contractual milestone MS9 has been met.	3/10/04

WBS	L3 Milestone Number	Name	Definition	FNAL Current Projection
MINOS Detector Milestones				
WBS	L3 Milestone Number	Name	Definition	FNAL Current Projection
2.3.1	L-3-301	Begin Near FE Electronics Installation	MINOS frontend electronics will be installed in racks underground during the period in which detector planes are being moved underground. Completion of this milestone consists of the first delivery of a plane's frontend electronics to the underground location and its installation in an electronics rack underground.	5/27/04
2.5.2	L-3-302	Begin Near Detector Infrastructure Installation	After underground beneficial occupancy, underground services directly connected to the experiment will be installed. These include LAN, controls, final electrical access points. Completion of this milestone will consist of determination by the responsible MINOS level 2 manager that this installation work has commenced.	2/27/04

WBS	L3 Milestone Number	Name	Definition	FNAL Current Projection
2.5.3	L-3-303	80% of ND Rack Assembly Complete	Near Detector Electronics racks will be assembled in an above-ground location for later transportation underground after the experiment receives occupancy of the underground spaces. Completion of this milestone will mean that the appropriate MINOS level 2 manager has indicated that 80% of the racks, including front-end electronics and VME master racks, are ready for	1/5/04
2.5.3	L-3-336	Checkout Readout Equipment	An integration subsystem using 9 spectrometer planes (the first 9 to be installed) will be installed and checked thru all electronics up to but not including the final data acquisition system. Completion of this milestone will mean that the Minos Level 1 manager certifies such a subsystem has been installed.	2/20/04
2.5.3	L-3-304	Begin Spectrometer Plane Installation	The MINOS Near Detector consists of a downstream muon spectrometer (installed first) and an upstream calorimetric section. Completion of this milestone will consist of transport of the first spectrometer plane from its storage area and its erection onto the underground support structure in the MINOS Hall.	3/31/04

WBS	L3 Milestone Number	Name	Definition	FNAL Current Projection
2.5.3	L-3-305	25% Detector Installed	Completion of this milestone means erection of 70 near detector planes onto the underground support structure in the MINOS Hall, as indicated by the appropriate Minos L2 manager.	4/29/04

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<i>s critical path w.r.t Fermilab Baseline project completion date.</i>				
Previous Projection	FNAL Baseline Date	Float*	Previous Float	Status
12/23/03	12/27/03	complete	complete	The three kicker magnets are assembled. Initial load testing is underway.
11/3/03	1/15/04	complete	complete	Complete
4/1/04	6/7/04	complete	7.1	Beamline tests of magnetic shielding are projected to begin in March '04.

Previous Projection	FNAL Baseline Date	Float*	Previous Float	Status
7/12/04	7/12/04	2.4	3.05	Design of the window has started
5/17/04	6/29/04	4.0	4.5	On schedule. Anticipated completion of this milestone is during the August 2004 shutdown
5/17/04	7/5/04	4.1	5.1	Progress on BPM's, multiwires and loss monitors continues in support of meeting this milestone. Multiwires will be ready in July/August, other items will be ready sooner.
11/4/03	2/26/04	complete	complete	

Previous Projection	FNAL Baseline Date	Float*	Previous Float	Status
3/15/04	3/29/04	complete	4.15	Horn 1 was moved from the assembly stand to the module/component stand and test fitted successfully. This milestone will be complete in late March after some minor re-work.
3/15/04	4/2/04	complete	2.45	Complete
3/1/04	4/8/04	complete	4.1	Complete

Previous Projection	FNAL Baseline Date	Float*	Previous Float	Status
2/27/04	5/20/04	complete	complete	Complete
2/27/04	2/16/04	complete	complete	Complete

Previous Projection	FNAL Baseline Date	Float*	Previous Float	Status
6/11/04	6/1/04	5.1	5.05	The horn power supply was moved underground in late March. This milestone will be complete after AC electrical power connections are made.
4/9/04	6/1/04	5.6	7.25	Parts are being machined both at FNAL and outside. Delivery is expected in May.
6/21/04	7/9/04	complete	1.95	Complete

Previous Projection	FNAL Baseline Date	Float*	Previous Float	Status
11/10/03	2/27/04	complete	complete	
12/23/03	3/19/04	complete	complete	Complete

Previous Projection	FNAL Baseline Date	Float*	Previous Float	Status
5/13/04	8/9/04	7.2	7.7	The hadron monitor is in fabrication. The HV supplies have been obtained.

Previous Projection	FNAL Baseline Date	Float*	Previous Float	Status
3/10/04	5/12/04	complete	7	Complete
Previous Projection	FNAL Baseline Date	Float*	Previous Float	Status

Previous Projection	FNAL Baseline Date	Float*	Previous Float	Status
3/10/04	12/25/03	complete	1.0	Detailed task status is provided in weekly updates
3/10/04	2/12/04	complete	1.0	Detailed task status is provided in weekly updates

Previous Projection	FNAL Baseline Date	Float*	Previous Float	Status
Previous Projection	FNAL Baseline Date	Float*	Previous Float	Status
5/27/04	4/19/04	complete on time	2.8	Complete as of 4/29/04
2/16/04	3/8/04	complete	complete on time	Complete as of 4/12/04

Previous Projection	FNAL Baseline Date	Float*	Previous Float	Status
1/5/04	1/30/04	complete	complete	
2/20/04	2/15/04	complete	complete	Expect to complete by end of February
3/31/04	3/31/04	complete	4.0	Complete as of 4/12/04

Previous Projection	FNAL Baseline Date	Float*	Previous Float	Status
7/16/04	4/29/04	5.5	5.5	Completed on 5/4/04