

Brookhaven National Laboratory/LIGHT SOURCES DIRECTORATE			
<b>Subject:</b>	<b>VACUUM PROCEDURES FOR BEAMLINE X-9A</b>		
<b>Number:</b>	LS-OPS-0115	<b>Revision:</b>	A
		<b>Effective:</b>	11/03/08
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\*Approval signatures on file with master copy.

The following procedures must be followed when bleeding up different beamline sections and when returning these sections to operation (refer to Beam Line Layout Drawing):

## **I. FRONT-END (PROCEDURE TO BE PERFORMED BY NSLS VACUUM GROUP ONLY)**

### **A. Bleed Up**

1. Notify the Coordinator (Beeper 5824).
2. Refer to Front-End Vacuum Procedures (SLS-07.19-13-1).

### **B. Return to Operation**

1. Notify the Coordinator (Beeper 5824).
2. Refer to Front-End Vacuum Procedures (SLS-07.19-13-1).

## **II. SECTION BETWEEN VALVE 1A AND VALVE 2A, MONOCHROMATOR CHAMBER**

### **A. Bleed Up**

1. Notify the Coordinator (Beeper 5824).
2. Hook up turbo pump to this section.
2. Close and seal Valve 1A and the Front-End High Vacuum Valve.
3. Coordinator places Yellow Tag on Valve 1A and the Front-End High Vacuum Valve.
4. Close and seal Valve 2A to preserve downstream vacuum.
5. Slowly bleed-up with boil-off N<sub>2</sub> while Coordinator monitors pressure upstream of Valve 1A (Front-End).

### **B. Return to Operation**

1. Pump to < 1x10<sup>-6</sup> Torr.
2. Notify the Coordinator (Beeper 5824).
3. Prepare for Front-End RGA scan.\*
4. Open Valve 1A provided pressure < 1x10<sup>-6</sup> Torr downstream of Valve 1A.
5. Perform Front-End RGA scan.\*
6. If RGA scan or pressure reading (if no RGA scan required) is satisfactory, Coordinator removes Yellow Tags from Valve 1A and the Front-End High Vacuum Valve.
7. Remove any unprotected turbo pump from this section or valve off the turbo pump and place a Yellow Tag on the valve.\*\*
8. Re-open downstream Valve 2A.

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### III. SECTION BETWEEN VALVE 2A AND VALVE 3A, MIRROR CHAMBER

#### A. Bleed-Up

1. Notify the Coordinator (Beeper 5824).
2. Hook up turbo pump to this section.
3. Close and seal Valve 2A, Valve 1A, and the Front-End High Vacuum Valve.
4. Coordinator places Yellow Tag on Valves 2A, 1A, and the Front-End High Vacuum Valve.
5. Close and seal Valve 3A to preserve downstream vacuum.
6. Slowly bleed-up with boil-off N<sub>2</sub> while Coordinator monitors pressure upstream of Valve 2A, (Monochromator Chamber), and in the Front-End.

#### B. Return to Operation

1. Pump to  $< 1 \times 10^{-6}$  Torr.
2. Notify the Coordinator (Beeper 5824).
3. Open Valve 2A provided pressure  $< 1 \times 10^{-6}$  Torr downstream of Valve 2A.
4. Open Valve 1A and the Front-End High Vacuum Valve following Section II.B.
5. If pressure reading is satisfactory, Coordinator removes Yellow Tags from Valves 2A, 1A, and the Front-End High Vacuum Valve.
6. Re-open downstream Valve 3A.
7. Remove any unprotected turbo pump from this section or valve off the turbo pump and place a Yellow Tag on the valve.\*\*

### IV. SECTION BETWEEN VALVE 3A AND VALVE 4A, SHUTTER AND BEAMPIPE

#### A. Bleed-Up

1. Notify the Coordinator (Beeper 5824).
2. Hook up turbo pump to this section.
3. Close and seal Valves 3A, 2A, 1A and the Front-End High Vacuum Valve.
4. Coordinator places Yellow Tags on Valves 3A, 2A, 1A and the Front-End High Vacuum Valve.
5. Close and seal Valve 4A to preserve downstream vacuum.
6. Slowly bleed-up with boil-off N<sub>2</sub> while Coordinator monitors pressure upstream of Valve 3A, (Mirror Chamber).

#### B. Return to Operation

1. Pump to  $< 1 \times 10^{-6}$  Torr.
2. Notify the Coordinator (Beeper 5824).
3. Open Valve 3A provided pressure  $< 1 \times 10^{-6}$  Torr downstream of Valve 3A.
5. Open Valve 2A provided pressure  $< 1 \times 10^{-6}$  Torr downstream of Valve 2A.
6. Open Valve 1A and the Front-End High Vacuum Valve following Section II.B.
7. If pressure reading is satisfactory, Coordinator removes Yellow Tags from Valve 3A, 2A, 1A and the Front-End High Vacuum Valve.
8. Re-open downstream Valve 4A.
9. Remove any unprotected turbo pump from this section or valve off the turbo pump and place a Yellow Tag on the valve.\*\*

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## V. SECTION BETWEEN VALVE 4A AND Be WINDOW 1A, BEAMPIPE

### A. Bleed-Up

1. Notify the Coordinator (Beeper 5824).
2. Hook up turbo pump to this section and isolate turbo.
2. Close and seal Valves 4A, 3A, 1A and the Front-End High Vacuum Valve.
3. Coordinator places Yellow Tags on Valves 4A, 3A, 1A and the Front-End High Vacuum Valve.
4. Slowly bleed-up with boil-off N<sub>2</sub> while Coordinator monitors pressure upstream of Valve 4A, (Shutter and Beampipe).

### B. Return to Operation

1. Pump to  $< 1 \times 10^{-6}$  Torr.
2. Notify the Coordinator (Beeper 5824).
3. Open Valve 4A provided pressure  $< 1 \times 10^{-6}$  Torr downstream of Valve 4A.
5. Open Valve 3A provided pressure  $< 1 \times 10^{-6}$  Torr downstream of Valve 3A.
6. Open Valve 1A and the Front-End High Vacuum Valve following Section II.B.
7. Remove any unprotected turbo pump from this section or valve off the turbo pump and place a Yellow Tag on the valve.\*\*

### \* NSLS POLICY FOR RGA SCANS (24 HOUR NOTICE REQUIRED)

An RGA scan is required before returning to operation if there is a major change of hardware in the vacuum system, i.e. changing of samples, mirrors, windows, monochromator crystals or gratings, manipulators, detectors, etc., **with the following two exceptions:**

1. After UHV sample chambers have been bled up for replacing components, an RGA scan will not be required if the chamber pressure is returned to  $< 2 \times 10^{-9}$  Torr and the Front End pressure remains  $< 2 \times 10^{-9}$  Torr when vacuum sections upstream of the chamber are opened into the Front End.
2. If any vacuum section upstream of the bled-up section remains at a pressure of  $< 9 \times 10^{-10}$  Torr as read using a hot-filament ion gauge, when the entire beamline is opened into the Front End, and the Front End pressure does not increase, no RGA is required.

### \*\* NSLS TURBO PUMP POLICY

An unprotected turbo pump is one not separated from the Front End by a beamline valve which automatically closes in the event of a power loss or a pressure increase at the turbo pump. **No unprotected turbo pump can share a contiguous vacuum with the Front End.**

**Document Review  
Frequency**

**3**      Years

Review signatures on file  
with master copy of  
controlled document

<b>LIGHT SOURCES DIRECTORATE REVISION LOG</b>		
<b>Document Number:</b>		LS-OPS-0115
<b>Subject:</b>		VACUUM PROCEDURES FOR BEAMLINE X-9A
<b>Rev</b>	<b>Description</b>	<b>Date</b>
A	Initial release into the Controlled Document System	11/03/08