Objectives

The objectives of the Quinnesec Mill Radiation Program are to provide for the safe use and handling of radioactive sources, to minimize personnel exposure and keep all potential releases of radioactive material as low as reasonably achievable (ALARA).

Radiation Safety Officer

The designated Radiation Safety Officer (RSO) at the Quinnesec Mill is Robert Grandahl. Attending a Company radiation training program or similar program recommended by the Company is necessary prior to becoming designated as an RSO or assistant RSO. The RSO is responsible for all licensing, testing, badge program, instruments, and audits.

Radiation Sources

The Quinnesec Mill does not have any identified sources of non-ionizing radiation. Ionizing radiation sources include Cs-137, Sr-90, Ni-63, Kr-85 and X-ray.

Location and license information are maintained in the Safety Office. The mill Index to Nuclear Devices for the NRC is attachment 1 at the end of this document.

Licensing

Materials License is maintained in the Quinnesec Mill Safety Department. Amendments are filed with the NRC and will be submitted by the RSO or designee. The RSO is responsible for ensuring compliance with all Federal and State regulatory permit requirements. The RSO or designee will serve as the contact for all regulatory interface.

Testing

The RSO or designee is responsible for conducting or making arrangements for the following:

1) Wipe tests on sources
2) Shutter test
3) Quarterly inventory (See Attachment 3)
4) Radiation Safety Program audit

Instruments

The RSO or designee is responsible for maintenance of equipment used in leak testing. Annual calibration with documentation is required for this equipment.

Storage

Storage of all sources not in service will be in an area that is locked and posted with signs denoting that radiation sources are stored.

ALARA Commitment

In accordance with recommendations of the NRC, the Quinnesec Mill will make every reasonable effort to maintain radiation exposure and releases of radioactive material As Low As Reasonably Achievable (ALARA).

Declared Pregnant Worker Program

The Declared Pregnant Worker Program is put in effect when a female worker voluntarily declares her pregnancy in writing to the Human Resources Department (The approximate due date must be included). If a pregnancy is not declared in writing to Human Resources, the company has no responsibility to implement any portion of this program.

Once written notification is made to Human Resources, the pregnant worker will have the option to continue working her normally assigned job. If in the course of her normal work she must be in the vicinity of a radiation source, she must wear a fetal dosimeter badge to measure radiation exposure and ensure the fetus is not exposed to any dangerous levels of radiation.

Any questions related to the Declared Pregnant Worker program can be directed to the mill Radiation Safety Officer.

ATTACHMENT 1:

QUINNESEC, MICHIGAN
INDEX TO NUCLEAR DEVICES **DATE: 1/31/2020**

	LOOP NUMBER	LOCATION	USE	SOURCE	SIZE	MFG.	SERIAL #	SOURCE HOLDER	TEST FREQ.
1	40-LX-007A	Pulp Mill	Chip Bin Level (source 1)	Cs 137	80 mCi	Vega Americas	65392	SHD	3 Year
2	40-LX-007B	Pulp Mill	Chip Bin Level (source 2)	Cs 137	100 mCi	Vega Americas	72921	SH100	3 Year
3	40-LX-048	Pulp Mill	Digester Level Control	Cs 137	3000 mCi	Vega Americas	72220	SHLG2	3 Year
4	40-LX-028	Pulp Mill	Chip Chute Level (HI)	Cs 137	100 mCi	Vega Americas	72935	SH100	3 Year
5	45-DX-005	Lime Kiln	Clarified Green Liquor, Density	Cs 137	100 mCi	Vega Americas	73857	SR1A	3 Year
6	45-DX-433 (formerly 45-DX-036	Lime Kiln	CD Filter Lime Mud	Cs 137	50 mCi	Vega Americas	75156	SR1A	3 Year
7	45-LX-421	Lime Kiln	CD Filter Level	Cs 137	300 mCi	Vega Americas	0673GK	SH-F2-45	3 Year
8	45-DX-052	Lime Kiln	Lime Mud	Cs 137	50 mCi	Vega Americas	75158	SR1A	3 Year
9	45-DX-053	Lime Kiln	Lime Mud	Cs 137	100 mCi	Vega Americas	61054	SR1A	3 Year
~~10*~~	~~45-DX-136~~	~~Lime Kiln~~	~~White Liquor Sludge~~	~~Cs 137~~	~~50 mCi~~	~~Vega Americas~~	~~75157~~	~~SR1A~~	~~3 Year~~
~~11**~~	~~37-LSH-257~~	~~Woodyard~~	~~Chip High Level~~	~~Cs 137~~	~~500 mCi~~	~~Vega Americas~~	~~75362~~	~~SHD~~	~~3 Year~~
12	38-DE-471	Chem. Prep.	Density - Metathesis Reactor	Cs 137	10 mCi	Vega Americas	9297GG	SH-F1	3 Year
13***	45-DT-136	Lime Kiln	White Liquor Sludge	Cs 137	5 mCi	Vega Americas	3947CR	SHLD-1	3 Year

* Source 45-DX-136 was removed from service under Vega Americas supervision (Scott Scheu) on 1/30/2020.
** Source 37-LSH-257 was removed from service under Vega Americas supervision (Scott Scheu) on 1/31/2020.
*** Source 45-DT-136 was installed under Vega Americas supervision (Scott Scheu) on 1/30/2020.

ATTACHMENT 2:

GUIDELINES FOR NON-QUINNESEC MILL PERSONNEL BRINGING NUCLEAR GAUGES OR OTHER NUCLEAR SOURCES ONTO QUINNESEC PROPERTY

The Quinnesec Mill utilizes small nuclear gauges under license attained from the federal Nuclear Regulatory Commission (NRC). The mill operates under a written Radiation Safety Program maintained by the Safety Department. As a part of this program, the following guidelines have been developed to instruct contractors, vendors, service rep.'s, or any other non-Quinnesec personnel in the minimum requirements to bring nuclear sources onto the Quinnesec Mill site.

I. Quinnesec Mill Project Managers (PM) who contract with non-Quinnesec personnel to bring nuclear gauges, exposure devices or other radiographic equipment on the Quinnesec Mill site have the responsibility to contact the mill Safety Department. Prior to non-Quinnesec personnel bringing nuclear equipment on site, the PM needs to confirm that the Contractor has a **copy of the license that the gauge will be used under** ready for review by the mill Safety Department at any time while the exposure device is on-site.

II. The PM is responsible to make non-Quinnesec personnel who bring a nuclear source onto the Quinnesec mill site, aware of the requirements spelled out in these guidelines.

III. All non-Quinnesec personnel operating the gauge or other nuclear source must be properly trained in safe operation of the equipment. **This training must be documented and documentation available for review by the Quinnesec Mill Safety Department** upon request.

IV. Non-Quinnesec personnel bringing a nuclear source or sources to the mill site **must have available a list of those sources including; Mfg name, source type, source size (in mCi or Gbq) and source holder type**.

V. Nuclear equipment must remain under the constant control of the non-Quinnesec personnel bringing it on site. When not in use, the gauge or equipment must be stored in its case with appropriate nuclear warning labels attached. The case must be securely locked with a padlock or built-in lock with key removed. At no time shall Quinnesec Mill personnel or any other non-trained personnel handle or operate the nuclear equipment.

VI. At no time shall nuclear equipment be shipped ahead to the Quinnesec Mill unless arrangements have been made with the Quinnesec Mill Safety Department in advance. Specific procedures for receiving and locking up nuclear equipment until authorized personnel arrive must be utilized.

ATTACHMENT 3: Sample Quarterly Inventory

QUARTERLY INVENTORY OF NUCLEAR DEVICES

LOCATION	USE	LEVEL AROUND SOURCE*	BACK-GROUND LEVEL **	STANDARD LEVEL (Level Around Source minus background)	SOURCE SIGNAGE		MOUNTING HARDWARE (OK or PROB.)	INSPECTOR INITIALS	DATE
					SECURELY IN PLACE?	LEGIBLE?			
PM	Chip Bin Level (source 1)								
PM	Chip Bin Level (source 2)								
PM	Digester Level Control								
PM	Chip Chute Level (HI)								
LIME KILN	Clarified Green Liquor, Density								
LIME KILN	CD Filter - Lime Mud								
LIME KILN	CD Filter - Level								
LIME KILN	Lime Mud								
LIME KILN	Lime Mud								
LIME KILN	White Liquor Sludge								
CHEM. PREP	Density - Metathesis Reactor								

* LEVEL AROUND SOURCE WOULD INCLUDE AN AREA APPROXIMATELY ONE TO THREE FEET AROUND THE SOURCE HOUSING.

** BACKGROUND LEVEL WOULD BE THE TYPICAL BACKGROUND RADIATION LEVEL IN THAT AREA, BUT AWAY FROM THE SOURCE