

# Desk Instruction for Managing Electronic Precipitation Data For Storm Water Projects

Effective Date: 4/14/2017

Next Review Date: 4/14/2020

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**REVISION HISTORY**

Document No./ Revision No.	Issue Date	Action	Description
SW-DI-10007, R0	4/14/2017	New desk instructions	New Desk Instructions

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## **1. PURPOSE AND SCOPE**

This desk instruction (DI) states the responsibilities and describes the process for managing electronic precipitation measurement data collected for use by Los Alamos National Laboratory (LANL or the Laboratory) storm water programs. Electronic data management processes include: downloading electronic data from remote data loggers using the Xconnect database and the LANL Weather Machine; processing the raw data files; uploading electronic data into Hydstra and into Locus Environmental Information Management Storm Water Tracking System (EIM SWTS). This procedure also describes the process for applying data qualifier codes and qualifier reasons to the calculated precipitation results stored in SWTS; estimating precipitation results when rain gage equipment failures occur; and producing the SWTS precipitation report on demand for dissemination to storm water project personnel. This procedure is to be used by environmental professional personnel assigned to operation and maintenance of the storm water project rain gage network.

## **2. BACKGROUND**

Measurement, collection, and management of precipitation data and calculated results are required by the Laboratory's National Pollutant Discharge Elimination System (NPDES) Multi-Sector General Permit (MSGP, NMR05GB21), Construction General Permit (CGP), and the NPDES Individual Permit (IP) for Storm Water Discharge from SWMUs and AOCs (NM0030759) issued to LANL by the Environmental Protection Agency (EPA).

The precipitation data reports are used for the NPDES permit compliance activities, including

- triggering rain-event inspections of best management practices and storm water control measures;
- triggering rain-event inspections of monitoring station equipment and sample retrieval after measurable storm events; and
- determining the discharge status of storm water outfalls (e.g., 'measurable discharge' determinations)

**2. BACKGROUND (continued)**

The 24-hour precipitation report that results from this desk instruction meets the regulatory requirements of the NPDES storm water permits. This precipitation report is also used by Consent Order and environmental surveillance storm water projects to guide field activities such as monitoring station inspections and sample retrieval. The storm water programs use precipitation data collected at LANL meteorological towers and reported on the LANL Weather Machine. In addition, a seasonal rain gage network is deployed during the months of April through November to coincide with the monitoring periods. Using a geospatial information system (GIS), storm water monitoring stations and permitted features are assigned to an individual rain gage using the method of Thiessen Polygons. The seasonal assignment of monitoring stations to rain gage Thiessen Polygons is managed in EIM SWTS by Field Planning and Work Authorization personnel. The use of the extended rain gage network allows the storm water projects to optimize field team response to only those areas where precipitation likely resulted in runoff.

**3. RESPONSIBLE PERSONNEL**

Surface Water Program Electronic Data Management Professional (SW Lead)

**4. EQUIPMENT AND TOOLS**

The following equipment and tools are necessary for this DI:

- Hydstra Data Management software
- Locus EIM account and EIM SWTS usage permissions
- Configured copy of the EIMExport script located in the WQDBStormWater folder in the storm water pmfs network drive.

**5. REFERENCES**

EIM Quick Start User Guide –Located under EIM documents on the Locus EIM website

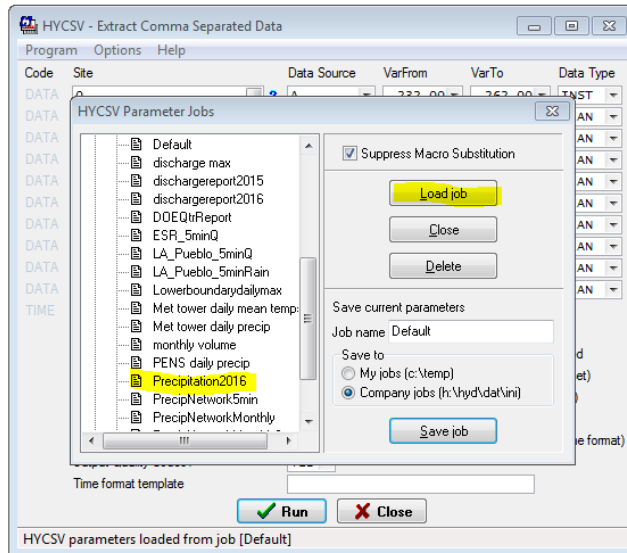
Hydstra User Guide- Located under the help tab when logged into the Hydstra desktop.

Meteorological Monitoring at Los Alamos LA-UR-08-3032- Located on the WeatherMachine website



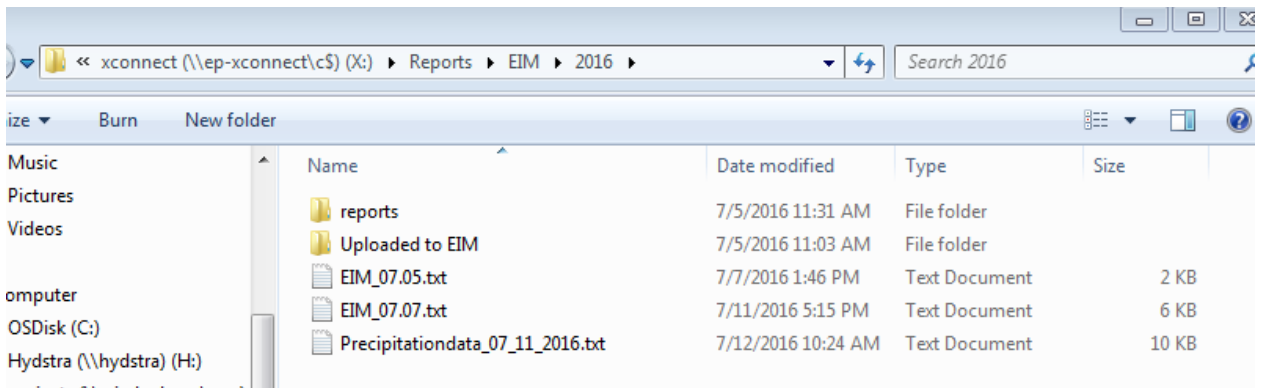
Desk Instruction

6. MANAGING ELECTRONIC PRECIPITATION DATA (continued)



[3] **IF** precipitation has occurred, **THEN VIEW** precipitation data on the weather machine <http://weather.lanl.gov/> to verify Meteorological tower data.

[4] **OPEN** EIM report in Excel. Report will be located at X:\Reports\EIM\2016. The EIM report will have an auto-generated name of based on the start date of the EIM report.



6. MANAGING ELECTRONIC PRECIPITATION DATA (continued)

[5] VALIDATE precipitation data in Excel using the following qualifiers:

Qualifier Codes	Qualifier Code Descriptions
A	Accepted
EST	Estimated Value
OE	Overestimated (melt from prior snowfall or hail)
UE	Underestimated (snowfall or hail prior to melt)
Qualifier Reason Codes	Qualifier Reason Code Descriptions
EQP	Equipment Failure
HAIL	Precipitation as Hail
INACTIVE	Station Inactive
INDETER	Indeterminate
MEAS ERR	Measurement Error
SNOW	Precipitation as Snow

The Qualifier codes are entered in columns D and H, while the Qualifier Reason codes are entered into columns E and I.

A	B	C	D	E	F	G	H	I	J	K	L	M
DP above TA-21	0.04 IN	A			0.03	0.33 A			ImpHYD. 30Max 0.03 began 13:45 on 07/25/2016.	7/25/2016	6:05	
Los Alamos above low-head weir	0.01 IN	A			0.01	0.08 A			ImpHYD. 30Max 0.01 began 15:15 on 07/25/2016.	7/25/2016	6:05	
South Fork of Acid Canyon	0.02 IN	A			0.02	0.17 A			ImpHYD. 30Max 0.02 began 13:50 on 07/25/2016.	7/25/2016	6:05	
Sandia E of Power Plant	0.08 IN	A			0.07	0.5 A			ImpHYD. 30Max 0.07 began 13:25 on 07/25/2016.	7/25/2016	6:05	
Asphalt Plant at Sigma Mesa	0.2 IN	A			0.14	0.83 A			ImpHYD. 30Max 0.14 began 13:40 on 07/25/2016.	7/25/2016	6:05	
Mortandad below Sediment Trap	0.23 IN	A			0.16	1.08 A			ImpHYD. 30Max 0.16 began 13:45 on 07/25/2016.	7/25/2016	6:05	
Pajarito below SR-501	0.01 IN	A			0.01	0.08 A			ImpHYD. 30Max 0.01 began 16:00 on 07/25/2016.	7/25/2016	6:05	
Pajarito above Threemile	0.38 IN	A			0.28	1 A			ImpHYD. 30Max 0.28 began 13:30 on 07/25/2016.	7/25/2016	6:05	
Canon de Valle above SR-501	0.01 IN	A			0.01	0.08 A			ImpHYD. 30Max 0.01 began 14:30 on 07/25/2016.	7/25/2016	6:05	
CDV tributary at Burn Grounds	0.15 IN	A			0.1	0.67 A			ImpHYD. 30Max 0.10 began 13:10 on 07/25/2016.	7/25/2016	6:05	
Phermex Facility	0.47 IN	A			0.32	1 A			ImpHYD. 30Max 0.32 began 13:35 on 07/25/2016.	7/25/2016	6:05	
Water below SR-4	0.08 IN	A			0.07	0.5 A			ImpHYD. 30Max 0.07 began 13:30 on 07/25/2016.	7/25/2016	6:05	
Fence below Meenie and Minie	0.29 IN	A			0.22	1 A			ImpHYD. 30Max 0.22 began 13:35 on 07/25/2016.	7/25/2016	6:05	
Chaquehui tributary at TA-33	0 IN	A			0	0 A			ImpHYD.	7/25/2016	6:05	
RGN-TA-06-0078	0.11 IN	A			0.07	1.25 A			ImpWM. 30Max 0.07 began 13:30 on 07/25/2016.	7/25/2016	6:15	
RGN-TA-49-0123	0.59 IN	A			0.42	1 A			ImpWM. 30Max 0.42 began 14:00 on 07/25/2016.	7/25/2016	6:15	
RGN-TA-53-1020	0.02 IN	A			0.02	0.5 A			ImpWM. 30Max 0.02 began 14:15 on 07/25/2016.	7/25/2016	6:15	
RGN-TA-54-0088	0.24 IN	A			0.23	0.75 A			ImpWM. 30Max 0.23 began 13:45 on 07/25/2016.	7/25/2016	6:15	
RGN-NCOM	0 IN	A			0	0 A			ImpWM.	7/25/2016	6:15	

[6] After validating, SAVE the file as a .txt file names “Precipitationdata\_xx\_xx\_xxxx.txt” with today’s date, not the start date of the file.

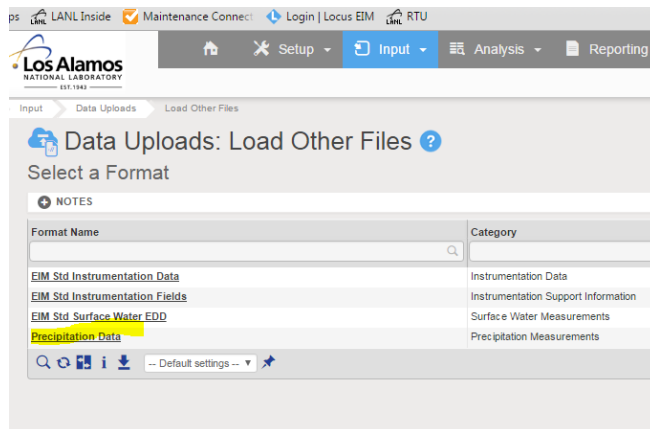
[7] UPLOAD the validated .txt file into EIM.

[A] LOG IN to Locus. SELECT Input/DataUploads/LoadFile/PrecipitationData

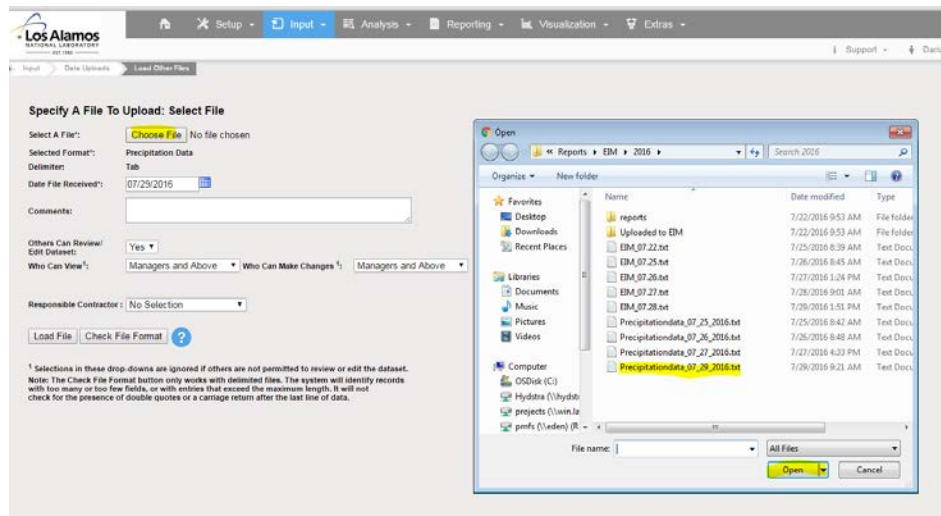


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6. MANAGING ELECTRONIC PRECIPITATION DATA (continued)



[B] **SELECT** “Choose File” and then navigate to the validated .txt file.



[C] **SELECT** “Load File.”

[D] **SELECT** manual review box if no errors are present. Then **SELECT** “Insert EDD into EIM.”

[8] **LOG IN** to Locus EIM. **NAVIGATE** to Extras/SWTS/PrecipitationReports. **IF** there are no exceedances;

[A] **CREATE** a pdf of the map portion of the report and **NAME** it “Precipitation map mm-dd-yyyy.” **IF** there is more than one storm event, **MAKE** a map for each storm event. **SEND** an email with this map as an attachment to [sw\\_precip\\_noexceed@lanl.gov](mailto:sw_precip_noexceed@lanl.gov). The email (titled “Precipitation update mm-dd-yy”) should be in the following format:

“The precipitation data from 4/27-5/4/15 have been uploaded into SWTS and verified and validated. There was precipitation on 5/3/15 with no exceedances of the 0.25”/30-minute intensity threshold. Attached is a map of the precipitation distribution for the 5/3 storm.”

**Desk Instruction**

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**6. MANAGING ELECTRONIC PRECIPITATION DATA (continued)**

[9] **IF** the 0.25"/30-min 24-hour rainfall intensity threshold is exceeded:

[A] **GENERATE** a precipitation report in Locus for each day with an intensity exceedance. **EDIT** by highlighting in yellow the rows with a 30-minute exceedance. **MERGE** and **CENTER** the title lines. In layout, **CHANGE** margins to narrow and **SELECT** landscape orientation. **ADD** boxes around all data.

[B] **SAVE** the report as a pdf in R:/IP Storm water Data/02\_Compliance Tracking Reporting\_6P/3.Data Stewardship/Precipitation/Storm Events 2016.

[C] **GENERATE** a precipitation map from the same day and **COMBINE** the file to create a single pdf precipitation report.

[D] **SEND** an email with the precipitation report as an attachment to [sw\\_precip@maillist.lanl.gov](mailto:sw_precip@maillist.lanl.gov). The email (titled "Precipitation report mm-dd-yy") should be in the following format:

"The precipitation data for 5/4/2015 have been uploaded into SWTS and verified and validated. The precipitation intensity threshold ( $\geq 0.25$  in/ 30 min) was exceeded at: E340."