**Section 611.922 System-Specific Studies**

a) System-Specific Study Plan. A supplier's system-specific study plan must be based on either existing monitoring results, as required under subsection (a)(1), or modeling, as required under subsection (a)(2). The supplier must prepare and submit the supplier's system-specific study plan to the Agency according to the schedule in Section 611.920(c).

1) Existing Monitoring Results. A supplier may comply by submitting monitoring results collected before it is required to begin monitoring under Section 611.920(c). The monitoring results and analysis must meet the criteria in subsections (a)(1)(A) and (a)(1)(B).

A) Minimum Requirements

i) TTHM and HAA5 results must be based on samples collected and analyzed in accordance with Section 611.381. Samples must be collected no earlier than five years prior to the study plan submission date.

ii) The monitoring locations and frequency must meet the conditions identified in the applicable of subsections (a)(1)(A)(iii) through (a)(1)(A)(xv). Each location must be sampled once during the peak historical month for TTHM levels or HAA5 levels or the month of warmest water temperature for every 12 months of data submitted for that location. Monitoring results must include all Subpart I compliance monitoring results, plus additional monitoring results as necessary to meet minimum sample requirements.

iii) A Subpart B system supplier that serves fewer than 500 persons must collect samples from three monitoring locations: three samples for TTHM and three samples for HAA5.

iv) A Subpart B system supplier that serves 500 to 3,300 persons must collect samples from three monitoring locations: nine samples for TTHM and nine samples for HAA5.

v) A Subpart B system supplier that serves 3,301 to 9,999 persons must collect samples from six monitoring locations: 36 samples for TTHM and 36 samples for HAA5.

vi) A Subpart B system supplier that serves 10,000 to 49,999 persons must collect samples from each of 12 monitoring locations: 72 samples for TTHM and 72 samples for HAA5.

vii) A Subpart B system supplier that serves 50,000 to 249,999 persons must collect samples from 24 monitoring locations: 144 samples for TTHM and 144 samples for HAA5.

viii) A Subpart B system supplier that serves 250,000 to 999,999 persons must collect samples from 36 monitoring locations: 216 samples for TTHM and 216 samples for HAA5.

ix) A Subpart B system supplier that serves 1,000,000 to 4,999,999 persons must collect samples from 48 monitoring locations: 288 samples for TTHM and 288 samples for HAA5.

x) A Subpart B system supplier that serves 5,000,000 or more persons must collect samples from 60 monitoring locations: 360 samples for TTHM and 360 samples for HAA5.

xi) A groundwater system supplier that serves fewer than 500 persons must collect samples from three monitoring locations: three samples for TTHM and three samples for HAA5.

xii) A groundwater system supplier that serves 500 to 9,999 persons must collect samples from three monitoring locations: nine samples for TTHM and nine samples for HAA5.

xiii) A groundwater system supplier that serves 10,000 to 99,999 persons must collect samples from 12 monitoring locations: 48 samples for TTHM and 48 samples for HAA5.

xiv) A groundwater system supplier that serves 100,000 to 499,999 persons must collect samples from 18 monitoring locations: 72 samples for TTHM and 72 samples for HAA5.

xv) A groundwater system supplier that serves 500,000 or more persons must collect samples from 24 monitoring locations: 96 samples for TTHM and 96 samples for HAA5.

B) Reporting Monitoring Results. A supplier must report the following information:

i) The supplier must report previously collected monitoring results and certify that the reported monitoring results include all compliance and noncompliance results generated during the time period that began with the first reported result and which ended with the most recent Subpart I results;

ii) The supplier must certify that the samples were representative of the entire distribution system and treatment and that the distribution system and treatment have not changed significantly since the samples were collected;

iii) The supplier's study monitoring plan must include a schematic of its distribution system (including distribution system entry points and their sources and storage facilities in the system), with notes indicating the locations and dates of all completed or planned system-specific study monitoring;

iv) The supplier's system-specific study plan must specify the population served and its system type (i.e., that it is a Subpart B or groundwater system);

v) The supplier must retain a complete copy of its system-specific study plan submitted under this subsection (a)(1), including any Agency modification of the supplier's system-specific study plan, for as long as the supplier is required to retain its IDSE report under subsection (b)(5); and

vi) If the supplier submits previously collected data that fully meet the number of samples required under subsection (a)(1)(A)(ii), and the Agency rejects some of the data in writing, by a SEP, the supplier must either conduct additional monitoring to replace rejected data on a schedule approved by the Agency in the SEP, or it must conduct standard monitoring under Section 611.921.

2) Modeling. A supplier may comply through analysis of an extended-period simulation hydraulic model. The extended-period simulation hydraulic model and analysis must meet the following criteria:

A) Minimum Extended-Period Hydraulic Model Requirements

i) The extended-period hydraulic model must simulate 24-hour variation in demand and show a consistently repeating 24-hour pattern of residence time.

ii) The extended-period hydraulic model must represent the criteria listed in subsection (a)(2)(D).

BOARD NOTE: This subsection (a)(2)(A)(ii) is derived from 40 CFR 141.602(a)(2)(i)(B). The Board has codified 40 CFR 141.602(a)(2)(i)(B)(*1*) through (a)(2)(i)(B)(*9*) as subsections (a)(2)(D)(i) through (a)(2)(D)(ix) to comport with Illinois Administrative Code codification requirements.

iii) The extended-period hydraulic model must be calibrated or have calibration plans for the current configuration of the distribution system during the period of high TTHM formation potential. All storage facilities in the system must be evaluated as part of the calibration process. All required calibration must be completed no later than 12 months after the supplier has submitted the plan.

B) Reporting Modeling. The supplier's system-specific study plan must include the information described in subsections (a)(2)(B)(i) through (a)(2)(B)(vii), subject to the requirements of subsection (a)(2)(B)(vii).

i) Tabular or spreadsheet data demonstrating that the model meets requirements in subsections (a)(2)(A)(ii) and (a)(2)(D).

ii) A description of all calibration activities undertaken and, if calibration is complete, a graph of predicted tank levels versus measured tank levels for the system storage facility with the highest residence time in each pressure zone, and a time~~-~~series graph of the residence time at the longest residence time storage facility in the distribution system showing the predictions for the entire simulation period (i.e., from time zero until the time it takes for the model to reach a consistently repeating pattern of residence time).

iii) Model output showing preliminary 24-hour average residence time predictions throughout the distribution system.

iv) The timing and the number of samples representative of the distribution system planned for at least one monitoring period of TTHM and HAA5 dual-sample monitoring at a number of locations no fewer than would be required for the system under standard monitoring in Section 611.921 during the historical month of high TTHM. These samples must be taken at locations other than existing Subpart I compliance monitoring locations.

v) A description of how all requirements will be completed no later than 12 months after the supplier submits the supplier's system-specific study plan.

vi) A schematic of the supplier's distribution system (including distribution system entry points and their sources and system storage facilities), with notes indicating the locations and dates of all completed system-specific study monitoring (if calibration is complete) and all Subpart I compliance monitoring.

vii) The population served and system type (i.e., that it is a Subpart B or groundwater system).

viii) The supplier must retain a complete copy of the supplier's system-specific study plan submitted under this subsection (a)(2), including any Agency modification of the supplier's system-specific study plan, for as long as the supplier is required to retain the supplier's IDSE report under subsection (b)(7).

C) If the supplier submits a model that does not fully meet the requirements under subsection (a)(2), the supplier must correct the Agency-cited deficiencies and respond to Agency inquiries concerning the model. If the supplier fails to correct deficiencies or respond to inquiries to the Agency's satisfaction, the supplier must conduct standard monitoring under Section 611.921.

D) The extended-period hydraulic model must represent the following criteria:

i) 75 percent of pipe volume;

ii) 50 percent of pipe length;

iii) All pressure zones;

iv) All 12-inch diameter and larger pipes;

v) All eight-inch and larger pipes that connect pressure zones, influence zones from different sources, storage facilities, major demand areas, pumps, and control valves or which are known or expected to be significant conveyors of water;

vi) All six-inch and larger pipes that connect remote areas of a distribution system to the main portion of the system;

vii) All storage facilities with standard operations represented in the model;

viii) All active pump stations with controls represented in the model; and

ix) All active control valves.

BOARD NOTE: This subsection (a)(2)(D) is derived from 40 CFR 141.602(a)(2)(i)(B). The Board has codified 40 CFR 141.602(a)(2)(i)(B)(*1*) through (a)(2)(i)(B)(*9*) as subsections (a)(2)(D)(i) through (a)(2)(D)(ix) to comport with Illinois Administrative Code codification requirements.

b) IDSE Report. The supplier's IDSE report must include the elements required in subsections (b)(1) through (b)(6). The supplier must submit its IDSE report according to the applicable of the schedules in Section 611.920(c).

1) The supplier's IDSE report must include all TTHM and HAA5 analytical results from Subpart I compliance monitoring and all system-specific study monitoring conducted during the period of the system-specific study presented in a tabular or spreadsheet format acceptable to the Agency. If changed from the supplier's system-specific study plan submitted under subsection (a), the supplier's IDSE report must also include a schematic of its distribution system, the population served, and system type (i.e., that it is a Subpart B or groundwater system).

2) If the supplier used the modeling provision under subsection (a)(2), it must include final information for the elements described in subsection (a)(2)(B), and a 24-hour time-series graph of residence time for each Subpart Y compliance monitoring location selected.

3) The supplier must recommend and justify Subpart Y compliance monitoring locations and timing based on the protocol in Section 611.925.

4) The supplier's IDSE report must include an explanation of any deviations from its approved system-specific study plan.

5) The supplier's IDSE report must include the basis (analytical and modeling results) and justification that it used to select the recommended Subpart Y monitoring locations.

6) The supplier may submit its IDSE report in lieu of its system-specific study plan on the schedule identified in Section 611.920(c) for submission of the system-specific study plan if the supplier believes that it has the necessary information before the time that the system-specific study plan is due. If the supplier elects this approach, its IDSE report must also include all information required under subsection (a).

7) The supplier must retain a complete copy of its IDSE report submitted under this Section for ten years after the date that the supplier submitted its IDSE report. If the Agency modifies the Subpart Y monitoring requirements that the supplier recommended in the supplier's IDSE report or if the Agency approves alternative monitoring locations, the supplier must keep a copy of the Agency's notification on file for ten years after the date of the Agency's notification. The supplier must make the IDSE report and any Agency notification available for review by the Agency or the public.

BOARD NOTE: Derived from 40 CFR 141.602.

(Source: Amended at 44 Ill. Reg. 6996, effective April 17, 2020)