

SUBSTITUTE FOR
HOUSE BILL NO. 5638

A bill to amend 1994 PA 451, entitled
"Natural resources and environmental protection act,"
by amending section 32706c (MCL 324.32706c), as added by 2008 PA
181.

THE PEOPLE OF THE STATE OF MICHIGAN ENACT:

1 Sec. 32706c. (1) If the assessment tool determines that a
2 proposed withdrawal **WITH A CAPACITY OF 1,000,000 GALLONS OF WATER**
3 **OR LESS PER DAY FROM THE WATERS OF THE STATE TO SUPPLY A COMMON**
4 **DISTRIBUTION SYSTEM** is a zone B withdrawal in a cold-transitional
5 river system, or a zone C or zone D withdrawal, the property owner
6 ~~shall~~ **MAY** submit to the department ~~a~~ **THE INFORMATION DESCRIBED IN**
7 **SECTION 32706A(3) AND EITHER OF THE FOLLOWING:**

8 **(A) AN ANALYSIS OF THE PROPOSED WITHDRAWAL BY A PROFESSIONAL**
9 **HYDROLOGIST OR HYDROGEOLOGIST CALCULATING THE STREAMFLOW DEPLETION**

1 OF THE PROPOSED WITHDRAWAL. THE ANALYSIS SHALL BE BASED ON AN
2 AQUIFER PERFORMANCE TEST, STREAMFLOW DEPLETION CALCULATIONS, AND
3 GEOLOGICAL DATA CONSISTING OF AT LEAST 1 OF THE FOLLOWING, WHICH
4 SHALL BE INCLUDED WITH THE ANALYSIS:

5 (i) EVIDENCE THE PROPOSED WITHDRAWAL IS IN THE WATER
6 MANAGEMENT UNIT OR UNITS THAT WERE PART OF A REGIONAL OR WATERSHED
7 BASED STUDY OF WATER USE IMPACTS ACCEPTED BY THE DEPARTMENT UNDER
8 THIS PART. THE EVIDENCE MUST INCLUDE AN AFFIDAVIT BY THE PROPERTY
9 OWNER THAT THE PROPOSED WITHDRAWAL IS LOCATED IN A RIVER SYSTEM AND
10 AQUIFER INCLUDED IN THE STUDY, AND RECORDS OF APPLICABLE DATA
11 COLLECTED IN THE STUDY.

12 (ii) A HYDROGEOLOGIC ANALYSIS OF THE WATER MANAGEMENT UNIT OR
13 UNITS THAT WILL POTENTIALLY BE AFFECTED BY THE PROPOSED WITHDRAWAL,
14 INCORPORATING DATA FROM WELL LOGS, GAMMA RAY LOGS, SURFICIAL MAPS
15 OF THE GLACIAL GEOLOGY, GEOLOGIC CROSS SECTIONS, AND ANY OTHER
16 AVAILABLE HYDROGEOLOGIC DATA.

17 (B) AN ANALYSIS BY A PROFESSIONAL HYDROLOGIST OR
18 HYDROGEOLOGIST OF A PROPOSED WITHDRAWAL FROM AN AQUIFER SEPARATED
19 FROM STREAMS BY BEDROCK, CALCULATING STREAMFLOW DEPLETION OF THE
20 PROPOSED WITHDRAWAL AS DESCRIBED IN THIS SUBDIVISION BY PROVIDING
21 HYDROGEOLOGIC DATA DEMONSTRATING THE BEDROCK TRANSMISSIVITY FOR THE
22 FORMATION OR RELYING ON PUBLISHED ESTIMATES OF TRANSMISSIVITY FOR
23 THE BEDROCK FORMATION.

24 (2) WITHIN 20 WORKING DAYS AFTER THE DEPARTMENT'S ACTUAL
25 RECEIPT OF THE ANALYSIS AND SUPPORTING EVIDENCE AND DATA RELATED TO
26 THE PROPOSED WITHDRAWAL UNDER SUBSECTION (1), THE DEPARTMENT SHALL
27 DETERMINE WHETHER A PROPOSED WITHDRAWAL IS A ZONE A, ZONE B, ZONE

1 C, OR ZONE D WITHDRAWAL AND SHALL PROVIDE TO THE PROPERTY OWNER
2 WRITTEN NOTIFICATION OF ITS DETERMINATION. HOWEVER, IF UPON A
3 PRELIMINARY REVIEW OF THE ANALYSIS AND SUPPORTING EVIDENCE AND DATA
4 THE DEPARTMENT DETERMINES THAT THE PROPOSED WITHDRAWAL WILL CAUSE A
5 REJECTION ONLY UNDER SUBDIVISION (D) (iv), THE DEPARTMENT MAY,
6 WITHIN THE FIRST 20 WORKING DAYS AFTER ACTUAL RECEIPT OF THE
7 ANALYSIS AND SUPPORTING EVIDENCE AND DATA RELATED TO THE PROPOSED
8 WITHDRAWAL UNDER SUBSECTION (1), PROVIDE WRITTEN NOTIFICATION TO
9 THE PROPERTY OWNER THAT UP TO 5 ADDITIONAL WORKING DAYS ARE NEEDED
10 FOR CONFIRMATION. IF THE DEPARTMENT DOES NOT PROVIDE WRITTEN
11 NOTIFICATION STATING A NEED FOR UP TO 5 ADDITIONAL WORKING DAYS OR
12 IF THE DEPARTMENT CITES ANY OTHER REASON UNDER SUBDIVISION (D) FOR
13 REJECTION, IT MUST MAKE ITS DETERMINATION AND PROVIDE TO THE
14 PROPERTY OWNER WRITTEN NOTIFICATION OF ITS DETERMINATION WITHIN 20
15 WORKING DAYS AFTER ACTUAL RECEIPT OF THE ANALYSIS AND SUPPORTING
16 EVIDENCE AND DATA RELATED TO THE PROPOSED WITHDRAWAL UNDER
17 SUBSECTION (1). THE DEPARTMENT'S DETERMINATION IS SUBJECT TO THE
18 FOLLOWING:

19 (A) IF THE DEPARTMENT FAILS TO PROVIDE WRITTEN NOTIFICATION TO
20 THE PROPERTY OWNER WITHIN THE TIME PERIOD REQUIRED UNDER THIS
21 SUBSECTION, THE PROPERTY OWNER MAY REGISTER THE WITHDRAWAL AND
22 PROCEED WITH THE WITHDRAWAL.

23 (B) IF THE DEPARTMENT DETERMINES THAT THE PROPOSED WITHDRAWAL
24 IS A ZONE A OR A ZONE B WITHDRAWAL, THE PROPERTY OWNER MAY REGISTER
25 THE WITHDRAWAL AND MAY PROCEED WITH THE WITHDRAWAL.

26 (C) IF THE DEPARTMENT DETERMINES THAT THE PROPOSED WITHDRAWAL
27 IS A ZONE C WITHDRAWAL, THE PROPERTY OWNER MAY REGISTER THE

1 WITHDRAWAL AND PROCEED TO MAKE THE WITHDRAWAL IF THE PROPERTY OWNER
2 SELF-CERTIFIES THAT HE OR SHE IS IMPLEMENTING APPLICABLE
3 ENVIRONMENTALLY SOUND AND ECONOMICALLY FEASIBLE WATER CONSERVATION
4 MEASURES PREPARED UNDER SECTION 32708A THAT THE PROPERTY OWNER
5 CONSIDERS TO BE REASONABLE OR HAS SELF-CERTIFIED THAT HE OR SHE IS
6 IMPLEMENTING APPLICABLE ENVIRONMENTALLY SOUND AND ECONOMICALLY
7 FEASIBLE WATER CONSERVATION MEASURES DEVELOPED FOR THE WATER USE
8 ASSOCIATED WITH THAT SPECIFIC WITHDRAWAL THAT THE PROPERTY OWNER
9 CONSIDERS TO BE REASONABLE. A PROPERTY OWNER PROCEEDING UNDER THIS
10 SUBDIVISION SHALL PROVIDE 5 SETS OF WATER LEVEL RECOVERY
11 MEASUREMENTS, AS DESCRIBED IN AN AQUIFER PERFORMANCE TEST, TAKEN
12 AFTER PUMPING BETWEEN JUNE AND OCTOBER WITHIN 2 YEARS AFTER THE
13 PRODUCTION WELL IS PUT IN SERVICE. THE DEPARTMENT SHALL NOT REQUIRE
14 SUBMISSION OF ADDITIONAL INFORMATION OR DATA FROM A PROPERTY OWNER
15 PROCEEDING UNDER THIS SUBDIVISION.

16 (D) IF THE DEPARTMENT DETERMINES THAT THE PROPOSED WITHDRAWAL
17 IS A ZONE D WITHDRAWAL, THE PROPERTY OWNER SHALL NOT REGISTER THE
18 WITHDRAWAL AND SHALL NOT MAKE THE WITHDRAWAL UNLESS THE PROPERTY
19 OWNER APPLIES FOR A WATER WITHDRAWAL PERMIT UNDER SECTION 32723 AND
20 THE WITHDRAWAL IS AUTHORIZED UNDER THAT SECTION, OR UNLESS IT IS
21 AUTHORIZED UNDER SUBSECTION (4). IN ADDITION TO THE WRITTEN
22 NOTIFICATION OF ITS DETERMINATION UNDER THIS SUBSECTION, IF THE
23 DEPARTMENT DETERMINES THAT THE PROPOSED WITHDRAWAL IS A ZONE D
24 WITHDRAWAL, THE DEPARTMENT SHALL INCLUDE DOCUMENTATION
25 DEMONSTRATING THAT THE PROPOSED WATER WITHDRAWAL IS LIKELY TO CAUSE
26 AN ADVERSE RESOURCE IMPACT. THE DOCUMENTATION SHALL INCLUDE 1 OR
27 MORE OF THE FOLLOWING:

1 (i) IDENTIFICATION OF SPECIFIC ERRORS IN DATA COLLECTION
2 PERFORMED BY THE PROFESSIONAL HYDROLOGIST OR HYDROGEOLOGIST THAT
3 RENDER THE ANALYSIS OF THE PROPOSED WITHDRAWAL INVALID.

4 (ii) A STATEMENT THAT THE PROFESSIONAL HYDROLOGIST OR
5 HYDROGEOLOGIST USED AN INAPPLICABLE MODEL TO ANALYZE THE PROPOSED
6 WITHDRAWAL, WITH AN EXPLANATION INCLUDING BOTH WHY THE MODEL
7 SELECTED FOR ANALYSIS WAS INAPPLICABLE FOR THE PROPOSED WITHDRAWAL
8 AND AN ANALYSIS USING AN APPLICABLE MODEL THAT SHOWS THE PROPOSED
9 WITHDRAWAL IS LIKELY TO CAUSE AN ADVERSE RESOURCE IMPACT.

10 (iii) IDENTIFICATION OF SPECIFIC ERRORS IN THE MODEL ANALYSIS
11 PERFORMED BY THE PROFESSIONAL HYDROLOGIST OR HYDROGEOLOGIST THAT
12 RENDER THE ANALYSIS OF THE PROPOSED WITHDRAWAL INVALID.

13 (iv) THE CUMULATIVE STREAMFLOW DEPLETION ESTIMATED FOR ALL THE
14 REGISTERED WATER WITHDRAWALS IN AN IMPACTED WATERSHED MANAGEMENT
15 AREA IS LIKELY TO CAUSE AN ADVERSE RESOURCE IMPACT. THE CUMULATIVE
16 STREAMFLOW DEPLETION CALCULATION SHALL ACCOUNT FOR REEVALUATION OF
17 PREVIOUSLY REGISTERED WATER WITHDRAWALS IN THE AFFECTED WATER
18 MANAGEMENT UNITS USING THE HUNT, 2003; WARD AND LOUGH, 2011; OR A
19 SIMILAR PEER-REVIEWED MODEL THAT ASSESSES POTENTIAL STREAM
20 DEPLETION.

21 (3) AFTER A PROPERTY OWNER REGISTERS A WITHDRAWAL PURSUANT TO
22 SUBSECTION (2), IF, IN DEVELOPING THE CAPACITY TO MAKE THE
23 WITHDRAWAL, THE CONDITIONS OF THE WITHDRAWAL DEVIATE FROM THE
24 SPECIFIC DATA THAT WERE EVALUATED, THE PROPERTY OWNER SHALL NOTIFY
25 THE DEPARTMENT OF THE CORRECTED DATA AND THE DEPARTMENT SHALL
26 CONFIRM ITS DETERMINATION UNDER SUBSECTION (2). IF THE CORRECTED
27 DATA DO NOT CHANGE THE DETERMINATION, THE PROPERTY OWNER MAY

1 PROCEED WITH THE WITHDRAWAL. IF THE CORRECTED DATA CHANGE THE
2 DETERMINATION, THE PROPERTY OWNER SHALL PROCEED UNDER THE
3 PROVISIONS OF THIS PART RELATED TO THE CORRECTED DETERMINATION.

4 (4) IF A PROPOSED WITHDRAWAL IS A ZONE B WITHDRAWAL IN A COLD-
5 TRANSITIONAL RIVER SYSTEM, OR A ZONE C OR ZONE D WITHDRAWAL, AND A
6 PROPERTY OWNER DOES NOT SUBMIT ANY OF THE INFORMATION DESCRIBED IN
7 SUBSECTION (1) OR THE DEPARTMENT DETERMINES UNDER SUBSECTION (2)
8 THAT THE PROPOSED WITHDRAWAL IS A ZONE D WITHDRAWAL, THE PROPERTY
9 OWNER MAY request for a site-specific review. Additionally, if the
10 assessment tool determines that a proposed withdrawal is a zone A
11 withdrawal, or a zone B withdrawal in a cool river system or a warm
12 river system and the property owner wishes to have a site-specific
13 review, the property owner may submit to the department a request
14 for a site-specific review. A request for a site-specific review
15 shall be submitted to the department in a form required by the
16 department and shall include all of the following:

17 (a) The information described in section 32706a(3).

18 (b) The intended maximum monthly and annual volumes and rates
19 of the proposed withdrawal, if different from the capacity of the
20 equipment used for making the proposed withdrawal.

21 (c) If the amount and rate of the proposed withdrawal will
22 have seasonal fluctuations, the relevant information related to the
23 seasonal use of the proposed withdrawal.

24 (d) A description of how the water will be used and the
25 location, amount, and rate of any return flow.

26 (e) Any other information the property owner would like the
27 department to consider in making its determination under this

1 section.

2 (5) ~~(2)~~ Upon receipt of a request for a site-specific review
3 **UNDER SUBSECTION (4)**, the department shall consider the information
4 submitted ~~to the department under subsection (1)~~ and shall consider
5 the actual stream or river flow data of any affected stream reach.
6 The department shall also apply the drainage area ~~aggregation~~
7 **INTEGRATION** standards provided in section 32706a(2)(a), (b), and
8 (c), if applicable, and account for cumulative withdrawals as
9 provided for in section 32706e. The department shall not rely on
10 the assessment tool's determination in making its determination
11 under a site-specific review. **THE DEPARTMENT MAY CALCULATE**
12 **STREAMFLOW DEPLETION USING HUNT, 2003; WARD AND LOUGH, 2011; OR A**
13 **SIMILAR PEER-REVIEWED MODEL THAT ASSESSES POTENTIAL STREAM**
14 **DEPLETION. THE CALCULATION OF STREAMFLOW DEPLETION MAY ALSO BE**
15 **CONDUCTED ON EXISTING WITHDRAWALS IN THE SAME WATER MANAGEMENT UNIT**
16 **OR UNITS AS THE PROPOSED WITHDRAWAL IF APPLICABLE DATA ARE**
17 **AVAILABLE. THIS DATA MAY BE USED TO PROVIDE ADDITIONAL EVIDENCE AS**
18 **NEEDED TO DEMONSTRATE WHETHER A PROPOSED WITHDRAWAL IS LIKELY TO**
19 **CAUSE AN ADVERSE RESOURCE IMPACT.**

20 (6) ~~(3)~~ The department shall complete ~~its~~ **A** site-specific
21 review within 10 working days of submittal of a request for a site-
22 specific review. If the department determines, based upon a site-
23 specific review, that the proposed withdrawal is a zone A or a zone
24 B withdrawal, the department shall provide written notification to
25 the property owner and the property owner may register the
26 withdrawal and may proceed with the withdrawal.

27 (7) ~~(4)~~ Subject to subsection ~~(5)~~, **(8)**, if the department

1 determines in conducting a site-specific review that the proposed
2 withdrawal is a zone C withdrawal, the property owner may register
3 the withdrawal and proceed to make the withdrawal if the property
4 owner self-certifies that he or she is implementing applicable
5 environmentally sound and economically feasible water conservation
6 measures prepared under section 32708a that the property owner
7 considers to be reasonable or has self-certified that he or she is
8 implementing applicable environmentally sound and economically
9 feasible water conservation measures developed for the water use
10 associated with that specific withdrawal that the property owner
11 considers to be reasonable.

12 **(8)** ~~(5)~~—Except for withdrawals exempt from obtaining a water
13 withdrawal permit under section 32723, if a site-specific review
14 determines that a proposed withdrawal is a zone C withdrawal with
15 capacity in excess of 1,000,000 gallons of water per day from the
16 waters of the state to supply a common distribution system, the
17 person proposing the withdrawal shall not register the withdrawal
18 and shall not proceed with making the withdrawal unless the person
19 obtains a water withdrawal permit under section 32723.

20 **(9)** ~~(6)~~—If the department determines, based upon a site-
21 specific review, that the proposed withdrawal is a zone D
22 withdrawal, the property owner shall not register the withdrawal
23 and shall not make the withdrawal unless he or she applies for a
24 water withdrawal permit under section 32723 and the withdrawal is
25 authorized under that section.

26 **(10)** ~~(7)~~—After a property owner registers a withdrawal
27 following a site-specific review, if, in developing the capacity to

1 make the withdrawal, the conditions of the withdrawal deviate from
2 the specific data that were evaluated in the site-specific review,
3 the property owner shall notify the department of the corrected
4 data and the department shall confirm its determination under the
5 site-specific review. If the corrected data do not change the
6 determination under the site-specific review, the property owner
7 may proceed with the withdrawal. If the corrected data change the
8 determination under the site-specific review, the property owner
9 shall proceed under the provisions of this part related to the
10 corrected determination.

11 ~~—— (8) Subject to subsection (9), prior to the implementation~~
12 ~~date of the assessment tool under section 32706a, a property owner~~
13 ~~proposing to develop withdrawal capacity on his or her property to~~
14 ~~make a new or increased large quantity withdrawal may submit to the~~
15 ~~department a request for an interim site-specific review under this~~
16 ~~subsection to determine whether or not the proposed withdrawal is~~
17 ~~likely to cause an adverse resource impact. The department, upon~~
18 ~~request, shall conduct an interim site-specific review under this~~
19 ~~subsection within a reasonable time period not to exceed 30 days~~
20 ~~based upon an evaluation of reasonably available information. For~~
21 ~~purposes of this part, a determination under an interim site-~~
22 ~~specific review under this subsection shall be afforded the same~~
23 ~~status as a site specific review otherwise conducted under this~~
24 ~~section.~~

25 ~~—— (9) Except for withdrawals exempt from obtaining a permit~~
26 ~~under section 32723, a property owner who, prior to the~~
27 ~~implementation of the assessment tool under section 32706a, intends~~

1 ~~to develop withdrawal capacity on his or her property to make a new~~
2 ~~or increased large quantity withdrawal of more than 1,000,000~~
3 ~~gallons of water per day from the waters of the state to supply a~~
4 ~~common distribution system shall obtain an interim site-specific~~
5 ~~review under subsection (8). If the interim site-specific review~~
6 ~~determines that the proposed withdrawal is a zone C withdrawal, the~~
7 ~~property owner shall not proceed with making the withdrawal unless~~
8 ~~the person obtains a water withdrawal permit under section 32723.~~

9 (11) NOTHING IN THIS SECTION ALTERS ANY REQUIREMENT TO
10 DISCLOSE INFORMATION OR ANY EXEMPTION FROM DISCLOSURE UNDER THE
11 FREEDOM OF INFORMATION ACT, 1976 PA 442, MCL 15.231 TO 15.246, AS
12 OTHERWISE PROVIDED UNDER SECTIONS 32707(6) AND 32708(4).

13 (12) AS USED IN THIS PART:

14 (A) "AQUIFER PERFORMANCE TEST" MEANS A CONTROLLED FIELD TEST
15 IN WHICH ALL OF THE FOLLOWING ARE DONE:

16 (i) AT LEAST 1 MONITORING WELL IS INSTALLED. THE MONITORING
17 WELL MUST BE INSTALLED IN THE SAME AQUIFER AND SCREENED AT OR NEAR
18 THE SAME DEPTH AS THE PRODUCTION WELL, AND BE LOCATED AT A DISTANCE
19 OF 1 TO 5 TIMES THE THICKNESS OF THE AQUIFER FROM THE PROPOSED
20 PRODUCTION WELL. A NEARBY EXISTING WELL MAY BE USED AS A MONITORING
21 WELL FOR THE TEST INSTEAD IF IT MEETS ALL THE MONITORING WELL
22 REQUIREMENTS.

23 (ii) STATIC WATER LEVEL ELEVATION MEASUREMENTS ARE TAKEN AT 1-
24 MINUTE INTERVALS FOR 24 HOURS BEFORE THE PUMPING PORTION OF THE
25 TEST TO AN ACCURACY OF 0.05 FEET.

26 (iii) PUMPING IS CONDUCTED AT A RATE AT OR ABOVE THE DESIRED
27 PRODUCTION RATE FOR THE DURATION OF THE TEST AND METERED OR

1 PERIODICALLY MEASURED TO ENSURE CONSISTENCY OF RATE.

2 (iv) THE PUMPING PORTION OF THE TEST IS CONDUCTED FOR A PERIOD
3 OF 24 HOURS IN CONFINED AQUIFERS OR 72 HOURS IN UNCONFINED
4 AQUIFERS, DURING WHICH DRAWDOWN MEASUREMENTS ARE TAKEN AT 1-MINUTE
5 INTERVALS TO AN ACCURACY OF 0.05 FEET.

6 (v) AFTER COMPLETION OF THE PUMPING PERIOD, MEASUREMENTS OF
7 WATER LEVEL RECOVERY ARE TAKEN AT 1-MINUTE INTERVALS FOR 24 HOURS
8 TO AN ACCURACY OF 0.05 FEET.

9 (vi) AN ANALYSIS IS CONDUCTED TO DETERMINE, AT A MINIMUM, THE
10 AQUIFER HYDRAULIC CHARACTERISTICS OF TRANSMISSIVITY AND STORAGE
11 COEFFICIENT EMPLOYING THE METHODS OF COOPER AND JACOB, 1946; THEIS,
12 1935; HANTUSH AND JACOB, 1955; HANTUSH AND JACOB, 1960; HANTUSH AND
13 JACOB, 1961; NEUMAN, 1972; NEUMAN, 1974; OR HUNT AND SCOTT, 2007.

14 (B) "COOPER AND JACOB, 1946" MEANS COOPER AND JACOB, 1946: "A
15 GENERALIZED GRAPHICAL METHOD FOR EVALUATING FORMATION CONSTANTS AND
16 SUMMARIZING WELL-FIELD HISTORY".

17 (C) "HANTUSH AND JACOB, 1955" MEANS HANTUSH AND JACOB, 1955:
18 "NON-STEADY RADIAL FLOW IN AN INFINITE LEAKY AQUIFER".

19 (D) "HANTUSH AND JACOB, 1960" MEANS HANTUSH AND JACOB, 1960:
20 "MODIFICATION OF THE THEORY OF LEAKY AQUIFERS".

21 (E) "HANTUSH AND JACOB, 1961" MEANS HANTUSH AND JACOB, 1961:
22 "AQUIFER TESTS ON PARTIALLY PENETRATING WELLS".

23 (F) "HUNT, 1999" MEANS HUNT, 1999: "UNSTEADY STREAM DEPLETION
24 FROM GROUND WATER PUMPING".

25 (G) "HUNT, 2003" MEANS HUNT, 2003: "UNSTEADY STREAM DEPLETION
26 WHEN PUMPING FROM SEMICONFINED AQUIFER".

27 (H) "HUNT AND SCOTT, 2007" MEANS HUNT AND SCOTT, 2007: "FLOW

1 TO A WELL IN A TWO-AQUIFER SYSTEM".

2 (I) "NEUMAN, 1972" MEANS NEUMAN, 1972: "THEORY OF FLOW IN
3 UNCONFINED AQUIFERS CONSIDERING DELAYED GRAVITY RESPONSE OF THE
4 WATER TABLE".

5 (J) "NEUMAN, 1974" MEANS NEUMAN, 1974: "EFFECT OF PARTIAL
6 PENETRATION ON FLOW IN UNCONFINED AQUIFERS CONSIDERING DELAYED
7 GRAVITY RESPONSE".

8 (K) "PROFESSIONAL HYDROLOGIST OR HYDROGEOLOGIST" MEANS AN
9 INDIVIDUAL HOLDING A LICENSE OR REGISTRATION FROM ANY STATE AS A
10 PROFESSIONAL HYDROLOGIST, HYDROGEOLOGIST, OR GEOLOGIST, OR A
11 CURRENT CERTIFICATION AS A PROFESSIONAL GEOLOGIST BY THE AMERICAN
12 INSTITUTE OF PROFESSIONAL GEOLOGY.

13 (l) "STREAMFLOW DEPLETION CALCULATION" MEANS AN EVALUATION OF
14 THE POTENTIAL STREAMFLOW DEPLETION IN WHICH ALL OF THE FOLLOWING
15 ARE DONE:

16 (i) THE STREAMBED CONDUCTANCE OF THE POTENTIALLY IMPACTED
17 STREAMS SHALL BE MEASURED IN-SITU USING SLUG TESTING, SEEPAGE METER
18 TESTING, OR BOTH.

19 (ii) AN AQUIFER PERFORMANCE TEST REPRESENTING THE PROPOSED
20 WITHDRAWAL LOCATION HAS BEEN COMPLETED.

21 (iii) AN ANALYSIS SHALL BE CONDUCTED TO CALCULATE STREAMFLOW
22 DEPLETION USING THE APPLICABLE METHOD OF HUNT, 1999; HUNT, 2003;
23 WARD AND LOUGH, 2011; OR A SIMILAR PEER-REVIEWED MODEL THAT
24 ASSESSES POTENTIAL STREAM DEPLETION. THE ANALYSIS MAY ALSO BE
25 CONDUCTED ON EXISTING WITHDRAWALS IN THE SAME WATER MANAGEMENT UNIT
26 OR UNITS AS THE PROPOSED WITHDRAWAL IF APPLICABLE DATA ARE
27 AVAILABLE. THIS MAY BE USED TO PROVIDE ADDITIONAL EVIDENCE AS

1 NEEDED TO DEMONSTRATE A PROPOSED WITHDRAWAL IS UNLIKELY TO CAUSE AN
2 ADVERSE RESOURCE IMPACT.

3 (M) "THEIS, 1935" MEANS THEIS, 1935: "THE RELATION BETWEEN THE
4 LOWERING OF THE PIEZOMETRIC SURFACE AND THE RATE AND DURATION OF
5 DISCHARGE OF A WELL USING GROUNDWATER STORAGE".

6 (N) "WARD AND LOUGH, 2011" MEANS WARD AND LOUGH, 2011: "STREAM
7 DEPLETION FROM PUMPING A SEMICONFINED AQUIFER IN A TWO-LAYER LEAKY
8 AQUIFER SYSTEM".