CDP- _____

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NOTICE OF INTENT TO DISCHARGE - ENGINEER REVIEW FORM

(Electronic Version Available at: http://casagrandeaz.us/dept/planning/building-division/engineering-permits/) Email: DCPermits@casagrandeaz.gov

ATTACHMENT 1: Plan submittal Checklist – This checklist is not required but it is provided to assist the applicant and their engineer in preparing required components for submittal for a sewage collection system (4.01 General Permit). Please be advised this attachment is intended as guidance and does not supersede the Arizona Revise Statutes or the Arizona Administrative Code.

Project Name:_____

A. Introduction

Use of this document in conjunction with the minimum design standards and specifications set forth in Arizona Administrative Code (A.A.C.) R18-9 will minimize review time and elimination of requests for additional information for a majority of projects. The use of this checklist is completely voluntary but will give guidance on self-review of projects to be submitted to ADEQ for engineering review for Sewage Collection System General Permit 4.01. This check list does not supersede the requirements in A.A.C. R18-9.

B. Instructions

Prior to submittal of the Notice of Intent, please review this checklist against the supporting documents for the project.

Most common requests for additional information are shown in Red.

C. Construction Plans/Specifications

C.1. General

1. ☐ The plans are readable, reproducible, 2'x3', and are folded.
2. ☐ Four (4) copies of the plans (folded with project name visible) and specifications submitted. (Rolled plans may be rejected by the review desk).
3. ☐ All sheets are signed, sealed and dated (including expiration date) by an Arizona registered P.E.
4. ☐ None of the sheets are marked "Preliminary", "Not for Construction" or similar language.
5. Construction Plan Cover sheet (check all that apply):
   a. ☐ Contains owner/developer name and contact information.
   b. ☐ Contains engineer name and contact information.
   c. ☐ Contains project name and number of lots served (for subdivisions).
   d. ☐ Contains a Site map with sufficient detail to give directions to reach the site from a major road or intersection.
   e. ☐ Contains a legend of all symbols used throughout the plans.
   f. ☐ Contains a list of all abbreviations used throughout the plans.
   g. ☐ Contains latitude and longitude coordinates.
   h. ☐ Contains a material quantity summary.
   i. ☐ Contains a sheet index.
6. ☐ All utilities (Water, Storm Water, Re-use Water, Electrical, Gas, etc) are shown with horizontal and vertical locations given.
7. ☐ Profiles showing elevations, pipe material, pipe diameter, slopes, and demonstration of all sewer crossings meeting minimum separation requirements.
8. ☐ Flood zone determination given and basis (even if none of the project is within a flood zone).
9. ☐ Water and sanitary sewer separation/protection notes included.
10. ☐ Invert elevations of both water and sewer pipes are given at all water lines and sewer lines crossings.
11. ☐ Sewer line is placed 2 feet below the 100-year storm scour depth and constructed using D.I.P. (if applicable).

C.2. Standard Plan Notes, Specifications, and Details

1. Standard details are either ☐ M.A.G or ☐ Pima County
2. Standard details include at least:
   a. ☐ Trenching and bedding details for each pipe material and size.
   b. ☐ Manhole detail for each size and type.
   c. ☐ Detail for water tight lid, if needed.
   d. ☐ Thrust block standard details.
3. Standard notes that include:
   a. ☐ Uniform slope test that will be performed on 100% of the sewer segments (see R18-9-E301(D)(2)(k)).
   b. ☐ Mandrel test that will be performed on 100% of the sewer segments (see R18-9-E301(D)(2)(i)).
   c. ☐ The low pressure air test that will be performed for each pipe material (see R18-9-E301(D)(2)(j)): ASTM F1417-92 (1998)
      - ☐ ASTM C924-02 (2002)
      - ☐ ASTM C828-03 (2003)
      - ☐ ASTM C1091-03a (2003)
      - ☐ ASTM C969-02 (2002)
      - ☐ ASTM D2321-00 (2000)
   d. ☐ The manhole integrity test that will be performed (see R18-9-E301(D)(3)(e)).
   e. ☐ Force main pressure test that will be performed including duration, pressure, and acceptable pressure loss (see R18-9-E301(D)(4)(f)).
4. ☐ Annotation of pipe material and diameter to be used for each segment.

C.2. Gravity Sewer

1. ☐ Distance between manholes, pipe size, material, and slope shown on each line segment.
2. ☐ Sewer lines are straight or have a radius of curvature not less than 200 ft.
3. ☐ Each sewer line is covered by at least 3 ft of earth cover. Std Detail and note included.
4. ☐ Each sewer line is 8 inches in diameter or greater (or 6 inches for last 400 feet of a dead end segment).
5. ☐ Minimum and maximum slope of each sewer line meets 2 fps ≤ s ≤ 10 fps (1.99 fps is less than 2 fps).
6. ☐ For segments with sewage velocity greater than 10 fps the line is constructed using ductile iron pipe, and the receiving manhole is structurally reinforced.
7. ☐ Manholes are located at all grade changes, size changes, alignment changes, sewer intersections, and meet the maximum spacing criteria and are consistent with either:
   - ☐ Maricopa Association of Governments (M.A.G.) Standards.
   - ☐ Pima County Wastewater Management Standards.

Pipe Diameter (in)	Minimum Slope (ft/ft)	Maximum Slope (ft/ft)
6	0.011	0.1218
8	0.0033	0.0830
10	0.0025	0.0616
12	0.0019	0.0483
14	0.0016	0.0394
15	0.0014	0.0359
18	0.0011	0.0281
24	0.0008	0.0192
30	0.0006	0.0142
36	0.0004	0.0112
48	0.0003	0.0076

Sewer Pipe Diameter (in)	Maximum Manhole Spacing (ft)
Less than 8	400
8 to less than 18	500
18 to less than 36	600
36 to less than 60	800
60 or greater	1300

8. ☐ Manholes are not located in areas subject to more than incidental runoff from rain falling in the immediate vicinity.
9. ☐ Manholes are located to provide adequate visibility and vehicular maintenance accessibility following construction.

C.2. Force Main

1. ☐ All force mains have the appropriate valves and controls required to prevent drainback.
2. ☐ Air release valves are incorporated at all high points. Locations are shown on the plan and profile.
3. ☐ Thrust blocks locations and standard details are shown and the plan and profile.
4. ☐ Velocity is between 3 and 7 fps for one pump and two pump operations.

C.3. Lift Station

1. ☐ Lift station is secured.
2. ☐ Location and content of the warning sign shown with 24-hour contact number.
3. ☐ Alarm system:
   - ☐ Audible and/or visible alarm.
   - ☐ Elevations of low and high levels of sewage are shown.
4. ☐ Active odor control system details provided.
5. ☐ Lift station is equipped with at least two pumps.
6. ☐ Piping, valves, and controls are shown and allow independent operation of each pump.
7. ☐ Sewage retention time does not exceed 30 minutes, or
8. ☐ Sewage is aerated, chemicals are added to prevent or eliminate hydrogen sulfide formation, or adequate ventilation is provided.
9. ☐ If the flow is greater than 5000 GPD, the cross-sectional area of the wet-well is at least 20 sq. ft.
10. ☐ Pumps are of grinder type, or
11. ☐ Pumps can pass a 2.5 in sphere.
12. ☐ The lift station is capable of operating at design flow with any one pump out of service (calculations provided).
13. ☐ If the sewage lift is more than 15 feet, suction pumps have not been used.
14. ☐ Pumps are self-priming and pump water brake horsepower is at least 0.00025 times the product of the required discharge, in GPM, and the required TDH, in ft.
15. ☐ If a stand-by generator is required (the flow is greater than 10,000 GPD), location and specifications given.

D. Design Report

A standardized Design Report is recommended to reduce review time and to ensure the required information is initially submitted to the Department. The use of the report format is completely voluntary.

D.1. General

1. ☐ Design Report is signed, sealed, dated (with expiration date included) by an Arizona registered P.E.
2. ☐ Two (2) copies of the Design Report are submitted.
3. ☐ Design Report flows are consistent with submitted capacity assurance forms and the Notice of Intent.
4. ☐ Master plan is included (if applicable).

Chapter 1 - Introduction

This section includes the following information:

1. ☐ Project location, including a discussion on how to access the project site.
2. ☐ Project description including master plan.
3. ☐ Elements served by the system.
4. ☐ Downstream point of discharge description (existing sewer line, wastewater treatment plant).
5. ☐ ADEQ file number for downstream point of discharge.

Chapter 2 – Basis of Design - Sewage Collection System

- *Section 2.1* – This section should include detailed description of the elements served by collection system must be specified, following Table 1 (R18-9-E301) and include table 2.1 Unit Design Flows for Proposed Project. Table 2.1 should include a summary of what flows were selected in the sizing of the system.
- *Section 2.2* – This section will summarize velocity min/max standards. Table 2.2 Performance Standards should include the minimum and maximum slopes for each pipe size in order for meet the 2 fps and 10 fps min/max standards.
- *Section 2.3* – This section should include, when applicable, the scour depth analysis must be performed, with identification of the sewer line segments that must be placed below the scour depth. Table 2.3 Scour Analysis

Chapter 3 – Basis of Design - Force Main and Lift Station

- *Section 3.1* – Description of the wet well corrosion protection method to achieve an operational life of at least 20 years.
- *Section 3.2* – Wet well sewage retention time calculations. When the retention time exceeds 30 minutes sewage must be aerated, chemicals are added to prevent or eliminate hydrogen sulfide formation, or adequate ventilation is provided.
- *Section 3.3* – Description of the wet well and force main odor control system. Where engineering justification is required, please include those calculations here.
- *Section 3.4* – Where a stand-by power generation is required (average flow of more than 10,000 GPD), details are provided.
- *Section 3.5* – Calculations showing that the wet well volume meets the following criteria: wet well volume in gallons is
  ¼ of the product of the minimum pump cycle time, in minutes, and the total pump capacity, in gallons per minute. Pump cycle time calculations are provided (data presented in appendix 2).
- *Section 3.6* – Engineering analysis of force mains for the proposed project (data in appendix 2).

Chapter 4 – Basis of Design – Water Distribution System

Information as required for submittals for drinking water systems which should include fire flow analysis.

Appendix 1 – Sewage Collection System Analysis

The appendix presents the hydraulic analysis of the system. An example of the format and information included in the appendix is given below.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1	Upstream MH	Downstream MH	Pipe Diameter (in)	Pipe Length (ft)	Pipe Material	Mannings n	Upstream Invert Elevation (ft)	Downstream Invert elevation (ft)	Slope (ft/ft)	Population Served	Upstream Flow (GPD)	Design Flow (GPD)	Total Flow (GPD)	Peaking Factor	Peak Flow (GPD)	Velocity Full (ft/s)	Capacity Full (MGD)	d/D (%)
2																		
3																		

Appendix 2 – Sewage Collection System Analysis

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1	Population Served	Design Flow (GPD)	Peaking Factor	Peak Flow (GPD)	Force Main Length (ft)	Force Main Size (in)	Flow Velocity (fps)	Roughness Coefficient	Capacity Flowing Full (GPD)	Working Pressure (psi)	Pipe Pressure Rating (psi)	Total Head Loss	Pump Capacity (GPM)	Wet Well Diameter (ft)	Wet Well Depth (ft)	Wet Well Volume (GAL)	Wet Well Cross-Sectional Area (sq. ft.)
2																	