



STATE OF IOWA

CHESTER J. CULVER, GOVERNOR
PATTY JUDGE, LT. GOVERNOR

DEPARTMENT OF NATURAL RESOURCES
RICHARD A. LEOPOLD, DIRECTOR

September 1, 2010

Dickinson County
C/o Daniel G. Eckert, P.E.
1802 Hill Avenue, Suite 2101
Spirit Lake, Iowa 51360

SUBJECT: Install Two Additional 14 ft. x 4 ft. Precast Concrete Box Culverts (230th Avenue at Lower Gar Lake, just upstream of the Outlet Channel)
The NW¹/₄ of the NW¹/₄ of Section 5, T98N, R36W; Dickinson County, partially within the Incorporated Limits of the City of Milford and partially within Dickinson County, Iowa

Dear Mr. Eckert:

Your application on behalf of Dickinson County and the City of Milford for a Flood Plain Development Permit for the above referenced project has been approved. Enclosed is Flood Plain Development Permit Number FP 2010-196 and an approved copy of the engineering plans. The permit was issued subject to various conditions, which you should review carefully. Please pay particular attention to conditions 7, 8, 9 and 10 which outline the requirements for revetment, spoil disposition, removal of temporary structures, and revision of the flood insurance study, respectively. If you don't agree with any of these conditions, you have 30 days from the date of mailing of the permit to appeal. If you wish to appeal, it is suggested that you contact our Legal Services Section within 15 days to determine the correct procedure and format. Also, any person can appeal the issuance of this permit within the same 30-day period.

Also enclosed is a DNR Form 37, Notification of Completion of Construction. The Form 37 must be completed and returned within 30 days of the completion of construction.

You are responsible for complying with all other local, state and federal statutes, ordinances, rules and permit requirements applicable to the construction, operation and maintenance of the approved works. The project may require a Section 404 Permit from the U. S. Army Corps of Engineers.

Please note that the project requires a Sovereign Land Construction Permit (Construction Permit) from the Department. It is my understanding that the Construction Permit has been completed and will be mailed to you in the same packet as this flood plain development permit. The Construction Permit contains conditions and instructions that the applicant is required to follow. You should be aware that construction may not begin until all necessary permits are obtained.

You are hereby notified that future Flood Plain Development Permit Applications for regulated activities adjacent to the Lower Gar Outlet Channel will be evaluated under the premise that flood discharges will no longer be restricted by the 230th Avenue crossing.

Thank you for your patience and cooperation. If you have any questions, please contact Rich Wirtz of our office at 515-281-6906.

Sincerely,



Kelly M. Stone, P.E.
Environmental Engineer Senior
Flood Plain Management Program
Water Resources Section

Enclosures

Copies:

- IDNR Field Office #3
- Dan Johnson, Rock Island District; U.S. Army Corps of Engineers; P.O. Box 2004; Rock Island, IL 61204-2004
- Donald F. Lamb, Mayor; City of Milford; Milford City Hall; 806 N. Avenue; Milford, IA 51351
- Monique Pilch; FEMA Region VII; 8300 College Blvd., Suite 200; Overland Park, KS 62210
- Herman Richter; P.O. Box 301; Milford, IA 51351
- Donald Olsen; 1010 J Avenue; Milford, IA, 51351
- James Bockman; 2216 225th St.; Milford, IA 51351
- Lawrence Tuttle; P.O. Box 18; Spirit Lake, IA 51360
- Dwayne Kraninger; 1006 S. Avenue; Milford, IA 51351
- Glen Peterson, District Superintendent; Iowa Great Lakes Sanitary District; 303 28th Street; Milford, IA 51351
- Dennis Goetzinger; 16456 255th Avenue; Spirit Lake, IA 51360
- Phyllis Hintz; 1557 220th Street; Milford, IA 51351

**IOWA DEPARTMENT OF NATURAL RESOURCES
FLOOD PLAIN DEVELOPMENT PERMIT**

PERMIT NUMBER: FP 2010-196

PERMIT ISSUED TO: Dickinson County
1802 Hill Avenue, Suite 2101
Spirit Lake, IA 51360

City of Milford
806 N. Avenue
Milford, IA 51351

PERMIT ISSUED BY: _____



DATE: 9-1-10

Kelly M. Stone, P.E.

Environmental Engineer Senior, Water Resources Section

PROJECT LOCATION: The NW1/4 of the NW1/4 of Section 5, T98N, R36W; Dickinson County, partially within the Incorporated limits of the City of Milford and partially within Dickinson County; Iowa

PERMITTED ACTIVITY: In accordance with the approved engineering plans and subject to the following permit conditions, permittee is authorized to construct and maintain two 14 ft. x 4 ft. precast concrete box culverts, install concrete aprons on an existing 12 ft. x 5 ft. precast concrete box culvert and perform miscellaneous channel improvements on the flood plain of Lower Gar Lake (just upstream of the Outlet Channel) at the above-described location.

BASIS FOR ISSUANCE: The decision to issue this permit was based on a staff review of the project with respect to relevant approval criteria contained in Chapter 72 of the Department's administrative rules (Agency 567, Iowa Administrative Code) and applicable provisions of Iowa Code Sections 455B.262, .264, .275 and .277. Results of the staff review are summarized in the attached project summary report by Rich Wirtz dated September 1, 2010, and the report is a part of this permit.

PERMIT CONDITIONS:

1. **Disclaimer.** No legal or financial responsibility arising from the construction, operation or maintenance of the approved works shall attach to the State of Iowa or the Department due to issuance of this permit.
2. **Maintenance.** The permittees and any successors in real estate on which the permitted activity is located shall be responsible for proper maintenance.
3. **Other Permits, Licenses and Regulations.** The permittees shall be responsible for complying with all other local, state and federal statutes, ordinances, rules and permit requirements applicable to the construction, operation and maintenance of the approved works.
4. **Revocation.** This permit may be revoked by the Department if construction is not completed within 5 years of the date of issue.
5. **Change in Plans.** This permit only authorizes construction in accordance with the approved engineering plans. No changes shall be made without prior authorization from the Department.

6. **Lands, Easements and Rights-of-Way.** The permittees shall be responsible for obtaining all lands, easements or rights-of-way necessary for the construction and maintenance of the approved works.
7. **Revetment Requirement.** Acceptable revetment material includes: riprap, field stone, quarry rock and broken concrete. When using broken concrete, all exposed reinforcing steel must be cut flush with the surface of the concrete prior to placement. Any concrete pieces larger than three feet across must be broken into smaller pieces prior to placement. The revetment shall consist of a uniform mixture of sizes of material laid to form a compact surface capable of resisting erosion. The use of asphalt or other solid waste is prohibited. The horizontal thickness of the revetment shall not exceed four feet. The finished slope on the revetment shall be no steeper than two feet horizontal to one foot vertical (2H:1V).
8. **Spoil Disposition Requirements.** All excess spoil material resulting from the project shall be removed from the flood plain and placed in an upland area. In addition, spoil material should not be placed in an area that is, or could be, classified as a regulated wetland.
9. **Removal of Temporary Structures.** All temporary structures, cofferdams, and work platforms used to construct the project shall be removed within 30 days of completion of construction of the project.
10. **Revision of Flood Insurance Study.** The permittee shall make application to the Federal Emergency Management Agency to revise the Flood Insurance Study to show the effects of the proposed project on the flood plain.

CERTIFICATION OF MAILING

I hereby certify that I have this _____ day of _____, 2010 mailed Flood Plain Development Permit No. FP 2010-196 to the permittees.

By _____

FLOOD PLAIN PROJECT SUMMARY REPORT

Project: Proposed Installation of Two Additional 14 ft. x 4 ft. Precast Concrete Box Culverts on the Flood Plain of Lower Gar Lake.
FP 2010-196

Prepared by: Rich Wirtz

Date: September 1, 2010

INFORMATION RECEIVED

An application and engineering plans have been received from Dickinson County and the City of Milford for approval of the installation of two additional 14 ft. x 4 ft. precast concrete box culverts under 230th Avenue, the installation of concrete aprons on an existing 12 ft. x 5 ft. precast concrete box culvert and miscellaneous channel improvements. The proposed project is located on the flood plain of the Lower Gar Lake (just upstream of the Outlet Channel) in the NW¼ of the NW¼ of Section 5, T98N, R36W; Dickinson County, partially within the incorporated limits of the City of Milford and partially within Dickinson County, Iowa.

DEPARTMENTAL JURISDICTION

Neither Dickinson County nor the City of Milford currently participate in the National Flood Insurance Program. A detailed study was prepared in April 2000 for the area which includes 100-year lake elevations and a 100 year flood profile and elevations for the Lower Gar Outlet Channel (a.k.a. Milford Creek).

The proposed project site is partially located in an urban area on the flood plain of a stream draining more than two square miles at the location of the culvert crossing. Therefore, approval by the Iowa Department of Natural Resources (Department) is required for the culvert installation as specified in 567-71.1(3), IAC.

The project occurs on lands and waters owned by the State of Iowa. Therefore, the project also requires a Sovereign Lands Construction Permit from the Department.

It is not known whether an application was submitted to the U.S. Army Corps of Engineers (the Corps) or whether the Department will need to issue an individual Section 401 Water Quality Certification of the proposed project.

PROJECT REVIEW

The drainage area at the project site, approximately 139 square miles, was determined from digital U.S. Geological Survey topographic maps. The submitted engineering plans show the physical characteristics of the project site, the proposed culvert installation, the proposed concrete apron installation and miscellaneous channel improvements. The project review utilized data contained in: the Dickinson County Flood Insurance Study; the

1997 Iowa Great Lakes Management Plan prepared by the Corps; the 1999 Little Sioux River Downstream Impacts of Lower Gar Lake Outlet Modifications, Iowa Great Lakes Management Plan prepared by the Corps; and the results of various HEC-RAS computer models.

The 1999 Corps study analyzed the effects of several roadway modification options on both upstream and downstream flood levels and flood durations. The general results of the analysis indicated that as the conveyance capacity beneath the roadway is increased, flood levels would decrease upstream and increase downstream, while the duration of elevated flood discharges would decrease. Although none of the options considered within the study match the option proposed in this application, the impacts of this project would be similar to the results obtained in the report.

HEC-RAS models were received by the Department from the Corps relating to various alternatives and conditions considered in the Iowa Great Lakes Management Plans. Geometric data contained in the models were based upon Corps collected topographic mapping referenced to NGVD 29. Flow data used within the models were based upon stage-storage-discharge relationships developed by the Corps which accounted for the natural storage within the Okoboji Chain of Lakes, the discharge capacity at 230th Avenue and the tail water effects of the down stream weir.

Modeling specific to current stream conditions or the proposed permit application conditions were not prepared by the applicant. Additionally, the base topographic mapping used to develop the HEC-RAS models as well as cross-section location mapping were not provided.

The review of the project included the preparation of three HEC-RAS models by the Department: an existing conditions model; a permit application conditions model; and a "no road" conditions model. These models were based upon the Corps provided models and were corrected to include: permitted culvert improvements since 1999; revisions within the model to the use of levee areas versus ineffective flow areas; inclusion of an in-line structure to account for the existing weir; revisions to main channel Manning's n-values to match 1999 Iowa Great Lakes Management Plan (page 21); extended cross section endpoints (using the blocked obstruction option) to encompass all storm events modeled; revised lengths between cross-sections at road crossings to eliminate errors; and centered road decks over culverts.

The results of the Department's hydraulic analysis indicate the proposed project would likely increase the 100 year flood profile for the reach down stream of 230th Avenue from 0.3 to 2.1 feet over existing conditions. If 230th Avenue were completely removed, the 100 year flood profile would increase from 0.3 to 2.6 feet over existing conditions. The attached table details the results of the modeling relative to the 100 year flood.

The flood discharges are specific to the available natural storage within the Okoboji Chain of Lakes and the culvert arrangement at 230th Avenue. An increase or decrease to the conveyance capacity of the crossing will result in a corresponding increase or decrease in flood discharges down stream. The current culvert arrangement at 230th Avenue restricts the natural flood discharges from the lake system, thus providing a measure of flood

protection to the downstream property owners that would otherwise not occur while increasing flood stages within the lake system. Although the proposed project would increase down stream discharges and stages over existing conditions, it does not serve to increase the 100 year flood stage over that of the "un-restricted" or natural conditions (i.e. the conditions likely to occur should the road be removed).

The results of the modeling show the project will not increase backwater (i.e. the depth of flood water upstream of the culverts) compared to existing conditions.

The permit will need to contain special conditions addressing: 1) requirements for revetment; 2) requirements for spoil disposition; 3) removal of temporary structures; and 4) revision of the flood insurance study.

The proposed project satisfies all applicable criteria for culverts as outlined in 567-72.1(5), IAC.

COMMENTS FROM AFFECTED LAND OWNERS

Pursuant to 567-70.5(3)e., a notice dated August 10, 2010 was sent to landowners who might be affected by the proposed project. The notice was sent via certified mail to 39 landowners the applicant identified as being adjacent to the Lower Gar Outlet Channel. The notice briefly described the proposed activity to be permitted and the potential impacts of the project on down stream flood stages. Notified landowners were informed they had the opportunity to submit comments concerning the proposed permit application. Comments would be considered before issuing an initial decision regarding the Flood Plain Development Permit application.

A second letter dated August 20, 2010 was sent via certified mail to the 39 landowners stating that comments concerning the Flood Plain Development Permit application would be accepted until August 31, 2010.

As of September 1, 2010 a total of 8 comments have been received by the Department. Of the comments received: two respondents were in favor of the project; one respondent was seeking more information regarding potential impacts of the project; and five respondents were not in favor of the project. Of the five dissenting respondents: three cited potential impacts to home/business or property; one did not want additional water on his/her property; and one gave no identifiable reason.

All comments were given consideration during the review of the permit application. In considering the comments, a review of the DNR's hydraulic models and the Corp's 1997 and 1999 studies was performed. Based upon this review, it was concluded that 230th Avenue and the existing crossing structures are providing an unintended measure of flood protection to downstream landowners by restricting downstream discharges and impounding more flood water within the chain of lakes than would be impounded if the waterway crossing did not exist. The proposed project would lessen the amount of flood water impounded within the lake system as compared to existing conditions while still maintaining flood discharges below the "un-restricted" or natural conditions. Therefore, downstream property owners are still receiving benefit from reduced flood discharges

even though the 230th Avenue crossing and the lake system are not intended or maintained to provide flood relief.

CONCLUSIONS AND RECOMMENDATIONS

The proposed project meets all relevant approval criteria in the administrative rules and all applicable criteria in Iowa Code sections 455B .262, .264, .275, and .277. It is recommended that the project be approved as proposed, subject to all applicable general conditions and the following special conditions:

Revetment Requirements. Acceptable revetment material includes: riprap, field stone, quarry rock, and broken concrete. When using broken concrete, all exposed reinforcing steel must be cut flush with the surface of the concrete prior to placement. Any concrete pieces larger than three feet across must be broken into smaller pieces prior to placement. The revetment shall consist of a uniform mixture of sizes of material laid to form a compact surface capable of resisting erosion. The use of asphalt or other solid waste is prohibited. The horizontal thickness of the revetment shall not exceed four feet. The finished slope on the revetment shall be no steeper than two feet horizontal to 1 foot vertical (2H:1V).

Spoil Disposition Requirements. All excess spoil material resulting from the project shall be removed from the flood plain and placed in an upland area. In addition, spoil material should not be placed in an area that is, or could be, classified as a regulated wetland.

Removal of Temporary Structures. All temporary structures, cofferdams, and work platforms used to construct the project shall be removed within 30 days of completion of construction of the project.

Revision of Flood Insurance Study. The permittee shall make application to the Federal Emergency Management Agency to revise the Flood Insurance Study to show the effects of the proposed project on the flood plain.

Additionally, it is recommended that the cover letter of the permit indicate that future Flood Plain Development Permit Applications for regulated activities adjacent to the Lower Gar Outlet Channel be evaluated under the premise that flood discharges will no longer be restricted by the 230th Avenue crossing.

River Sta	Existing Conditions		Proposed Conditions		Elevation Difference (ft)	No Road Conditions		Elevation Difference (ft)
	Q Total (cfs)	W.S. Elev NGVD29 (ft)	Q Total (cfs)	W.S. Elev NGVD29 (ft)		Q Total (cfs)	W.S. Elev NGVD29 (ft)	
35720	982	1398.96	1220	1398.93	-0.03	1280	1398.02	-0.94
35670	982	1398.92	1220	1398.90	-0.02	1280	1397.98	-0.94
35623	Culvert - Lower Gar Road							
35578	982	1397.56	1220	1397.84	0.28	1280	1397.91	0.35
35516	982	1397.55	1220	1397.81	0.26	1280	1397.88	0.33
35440	982	1397.51	1220	1397.77	0.26	1280	1397.83	0.32
35412	982	1397.50	1220	1397.75	0.25	1280	1397.81	0.31
35394	Inl Struct - Spillway							
35250	982	1396.62	1220	1397.20	0.58	1280	1397.34	0.72
35242	982	1396.61	1220	1397.19	0.58	1280	1397.33	0.72
35215	982	1396.57	1220	1397.16	0.59	1280	1397.30	0.73
35040	982	1396.50	1220	1397.10	0.60	1280	1397.25	0.75
34730	982	1396.31	1220	1396.91	0.60	1280	1397.06	0.75
34165	982	1396.04	1220	1396.64	0.60	1280	1396.79	0.75
33683	982	1395.71	1220	1396.31	0.60	1280	1396.46	0.75
32921	982	1395.21	1220	1395.83	0.62	1280	1395.99	0.78
32260	982	1394.85	1220	1395.47	0.62	1280	1395.63	0.78
31780	982	1394.62	1220	1395.25	0.63	1280	1395.41	0.79
31340	982	1394.41	1220	1395.03	0.62	1280	1395.18	0.77
30665	982	1393.86	1220	1394.51	0.65	1280	1394.68	0.82
30054	982	1393.28	1220	1394.03	0.75	1280	1394.23	0.95
29551	982	1393.06	1220	1393.86	0.80	1280	1394.07	1.01
28993	982	1392.87	1220	1393.70	0.83	1280	1393.92	1.05
28955	982	1392.70	1220	1393.51	0.81	1280	1393.72	1.02
28910	Culvert - 220th Street							
28878	982	1391.65	1220	1392.11	0.46	1280	1392.22	0.57
28841	982	1391.62	1220	1392.09	0.47	1280	1392.20	0.58
28316	982	1391.47	1220	1391.95	0.48	1280	1392.06	0.59
27827	982	1390.91	1220	1391.33	0.42	1280	1391.42	0.51
27291	982	1389.67	1220	1390.26	0.59	1280	1390.39	0.72
26554	982	1389.91	1220	1389.51	0.60	1280	1389.65	0.74
25610	982	1388.16	1220	1388.81	0.65	1280	1388.98	0.82
24727	982	1387.47	1220	1388.22	0.75	1280	1388.42	0.95
23980	982	1387.10	1220	1387.89	0.79	1280	1388.10	1.00
23410	982	1386.91	1220	1387.73	0.82	1280	1387.95	1.04
22852	982	1386.10	1220	1386.96	0.86	1280	1387.21	1.11
22584	982	1386.17	1220	1387.04	0.87	1280	1387.28	1.11
22566	982	1385.97	1220	1386.80	0.83	1280	1387.04	1.07
22525	Culvert - 225th Street							
22510	982	1385.79	1220	1386.45	0.66	1280	1386.63	0.84
22487	982	1385.85	1220	1386.44	0.59	1280	1386.62	0.77
21865	982	1385.48	1220	1386.13	0.65	1280	1386.34	0.86
21391	982	1385.22	1220	1385.89	0.67	1280	1386.11	0.89
20968	982	1385.07	1220	1385.76	0.69	1280	1385.99	0.92
20465	982	1384.82	1220	1385.53	0.71	1280	1385.78	0.96
20039	982	1384.65	1220	1385.38	0.73	1280	1385.63	0.98
19677	982	1384.42	1220	1385.17	0.75	1280	1385.45	1.03
19284	982	1384.15	1220	1384.93	0.78	1280	1385.24	1.09
18756	982	1383.83	1220	1384.71	0.88	1280	1385.06	1.23
18055	982	1383.61	1220	1384.55	0.94	1280	1384.91	1.30
17515	982	1383.36	1220	1384.39	1.03	1280	1384.79	1.43
17019	982	1383.20	1220	1384.29	1.09	1280	1384.71	1.51
16314	982	1382.92	1220	1384.14	1.22	1280	1384.58	1.66
15127	982	1382.35	1220	1383.89	1.54	1280	1384.37	2.02
14669	982	1382.05	1220	1383.80	1.75	1280	1384.30	2.25
14018	982	1381.72	1220	1383.67	1.95	1280	1384.21	2.49
13562	982	1381.61	1220	1383.67	2.06	1280	1384.20	2.59
13532	982	1381.32	1220	1383.34	2.02	1280	1383.89	2.57
13450	Culvert - Old HWY 71							
13400	982	1380.50	1220	1381.95	1.45	1280	1382.31	1.81
13375	982	1380.50	1220	1381.95	1.45	1280	1382.31	1.81
12716	982	1380.39	1220	1381.90	1.51	1280	1382.27	1.88
11749	982	1380.28	1220	1381.83	1.55	1280	1382.21	1.93
11051	982	1380.18	1220	1381.78	1.60	1280	1382.16	1.98
10668	982	1380.01	1220	1381.63	1.62	1280	1382.02	2.01

River Sta	Existing Conditions		Proposed Conditions		Elevation Difference (ft)	No Road Conditions		Elevation Difference (ft)
	Q Total (cfs)	W.S. Elev NGVD29 (ft)	Q Total (cfs)	W.S. Elev NGVD29 (ft)		Q Total (cfs)	W.S. Elev NGVD29 (ft)	
10590	982	1379.67	1220	1381.22	1.55	1280	1381.59	1.92
10400	Culvert - USH 71							
10332	982	1375.40	1220	1375.66	0.26	1280	1375.72	0.32
10279	982	1375.77	1220	1376.19	0.42	1280	1376.29	0.52
10034	982	1375.36	1220	1375.87	0.51	1280	1376.00	0.64
9621	982	1375.05	1220	1375.54	0.49	1280	1375.67	0.62
9179	982	1374.71	1220	1375.25	0.54	1280	1375.38	0.67
8707	982	1374.43	1220	1374.99	0.56	1280	1375.13	0.70
8279	982	1374.01	1220	1374.65	0.64	1280	1374.81	0.80
7844	982	1373.54	1220	1374.21	0.67	1280	1374.37	0.83
7732	982	1373.51	1220	1374.15	0.64	1280	1374.31	0.80
7612	982	1373.29	1220	1374.00	0.71	1280	1374.18	0.89
7197	982	1372.43	1220	1373.18	0.75	1280	1373.38	0.95
6756	982	1372.05	1220	1372.89	0.84	1280	1373.11	1.06
6349	982	1371.74	1220	1372.57	0.83	1280	1372.79	1.05
5988	982	1370.28	1220	1370.91	0.63	1280	1371.06	0.78
5652	982	1369.92	1220	1370.60	0.68	1280	1370.78	0.86
5215	982	1368.94	1220	1369.94	1.00	1280	1370.19	1.25
4963	982	1369.00	1220	1369.97	0.97	1280	1370.21	1.21
4723	982	1368.91	1220	1369.91	1.00	1280	1370.15	1.24
4384	982	1368.83	1220	1369.84	1.01	1280	1370.08	1.25
4345	982	1368.80	1220	1369.78	0.98	1280	1370.02	1.22
4300	Culvert - Gravel Road							
4279	982	1366.34	1220	1366.94	0.60	1280	1367.02	0.68
4249	982	1366.35	1220	1366.98	0.63	1280	1367.06	0.71
4069	982	1364.59	1220	1365.80	1.21	1280	1365.96	1.37
3772	982	1362.99	1220	1363.27	0.28	1280	1363.33	0.34
3157	982	1361.90	1220	1362.28	0.38	1280	1362.35	0.45
2802	982	1360.14	1220	1360.48	0.34	1280	1360.60	0.46
2362	982	1359.10	1220	1359.72	0.62	1280	1359.87	0.77
2087	982	1357.55	1220	1357.86	0.31	1280	1357.92	0.37
1655	982	1356.98	1220	1357.40	0.42	1280	1357.50	0.52
1262	982	1356.00	1220	1356.42	0.42	1280	1356.52	0.52
995	982	1355.70	1220	1356.13	0.43	1280	1356.22	0.52
496	982	1354.84	1220	1355.23	0.39	1280	1355.32	0.48
90	982	1354.38	1220	1354.78	0.40	1280	1354.88	0.50