

*File: Livestock-Clinton Co.
J.B. Timmermann Dairy Farm*

NETEMEYER ENGINEERING ASSOCIATES, INC.
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March 15, 2009

Andrew J. Nicholas
Assistant Attorney General
Environmental Bureau
500 S. 2nd St.
Springfield, IL 62706

Re: JB Timmermann Farms, Ltd.

Mr. Nicholas:

Following is a professional engineering study of silage leachate production, containment and runoff control at the JB Timmermann dairy farm located 3/4 miles south of Breese, Illinois:

The JB Timmermann dairy farm has a silage bunker measuring approximately 120 feet x 275 feet x 8 feet tall with a concrete floor and concrete walls that is capable of storing approximately 5940 tons of silage at an assumed density of 45 pounds per cubic foot. (All assumptions based on NRCS design guidelines) If not properly compacted and covered against rainfall infiltration, this stored silage has the potential to produce a leachate that has a biological oxygen demand between 12,000 and 90,000 ppm. The quantity of this leachate can vary considerably depending on the care taken by the farmer in harvesting corn or sorghum at the right moisture content, its cut length, the degree of packing and resulting density, the height to which silage is packed and proper placement and care of the cover. Proper "ensiling" will produce the best silage with negligible leachate while improper "ensiling" will produce poor silage and up to 70 gallons leachate per ton of silage after the first week of ensiling. Most of the leachate is produced during the first three weeks after the silage stack is created. If the dry matter content of the silage is maintained above 30% and rainfall infiltration into the stack is prevented except at the loading end of the stack, then the silage leachate production will be substantially reduced, if not eliminated.

I noted during my inspection that the silage bunks were well covered except at the loading end as is the standard and accepted practice for silage bunkers. Therefore, since the higher leachate production noted in the literature occurred with uncovered silage, in my design, based on examples provided by NRCS and because of current practices on the Timmermann farm, I assumed a leachate worst-case production rate of 7.5 gallons per ton of silage to determine the amount of leachate needed to be stored and/or diluted. According to the attached calculations, topographic information and proposed design, the existing concrete bunker slabs slope to the East or to the North and the design plan is to install a 20 feet wide by 120 feet long concrete slab Eastern extension to the existing silage bunker's concrete slab.

Calculations attached, as suggested by NRCS & EPA design guidelines using Hydrocad software for a six-inch 24-hour rainfall event, indicates that approximately 121,000 gallons (0.371 acre feet) of reserve storage capacity for leachate and rainfall are required for this size silage storage bunker. As demonstrated in calculations previously submitted, the existing 12,000,000 gallon wastewater storage lagoon has at least 2,000,000 gallons of excess storage available and is more than adequate for handling the worst-case amount of silage leachate and

associated rainfall runoff from the Timmermann silage bunker . According to the attached plans, leachate flow will be directed from proposed collection pits at the end of the existing bunker slab to a eight-inch diameter gravity effluent line to the Northwest corner of the existing bunker. At this location water from this eight-inch diameter gravity line will flow into a proposed manhole with an 200 gallon per minute (0.44cfs) pump which is sized to handle a 6 inch 24 hour rainfall event and the leachate flow.

This proposed 200 gallon per minute pump will discharge through a four inch diameter forcemain to the existing 12,000,000 gallon storage lagoon. This proposed pump should be powered only during periods when leachate is being produced which typically will occur only during the first three weeks after ensiling.

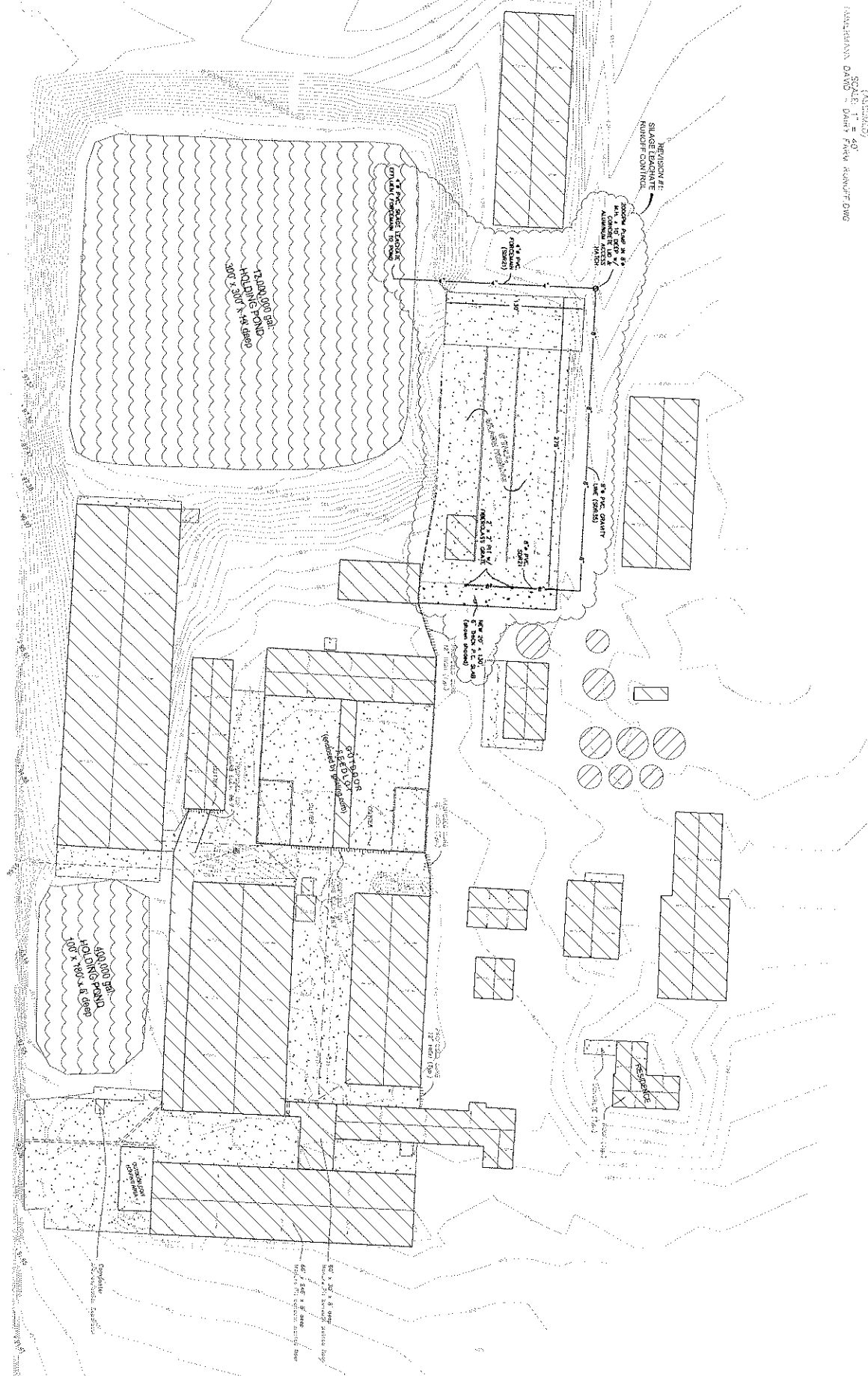
I hope the above adequately addresses your concerns. Please realize that if Timmermann properly harvests and stores his silage, there will be negligible silage leachate and the silage will have more food value for his cows. So, in the interest of less expensive milk production and more profits, Timmerman is naturally encouraged to manage his ensiling practices to eliminate silage leachate.

If you have any questions or need additional information, please call.

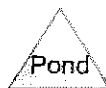
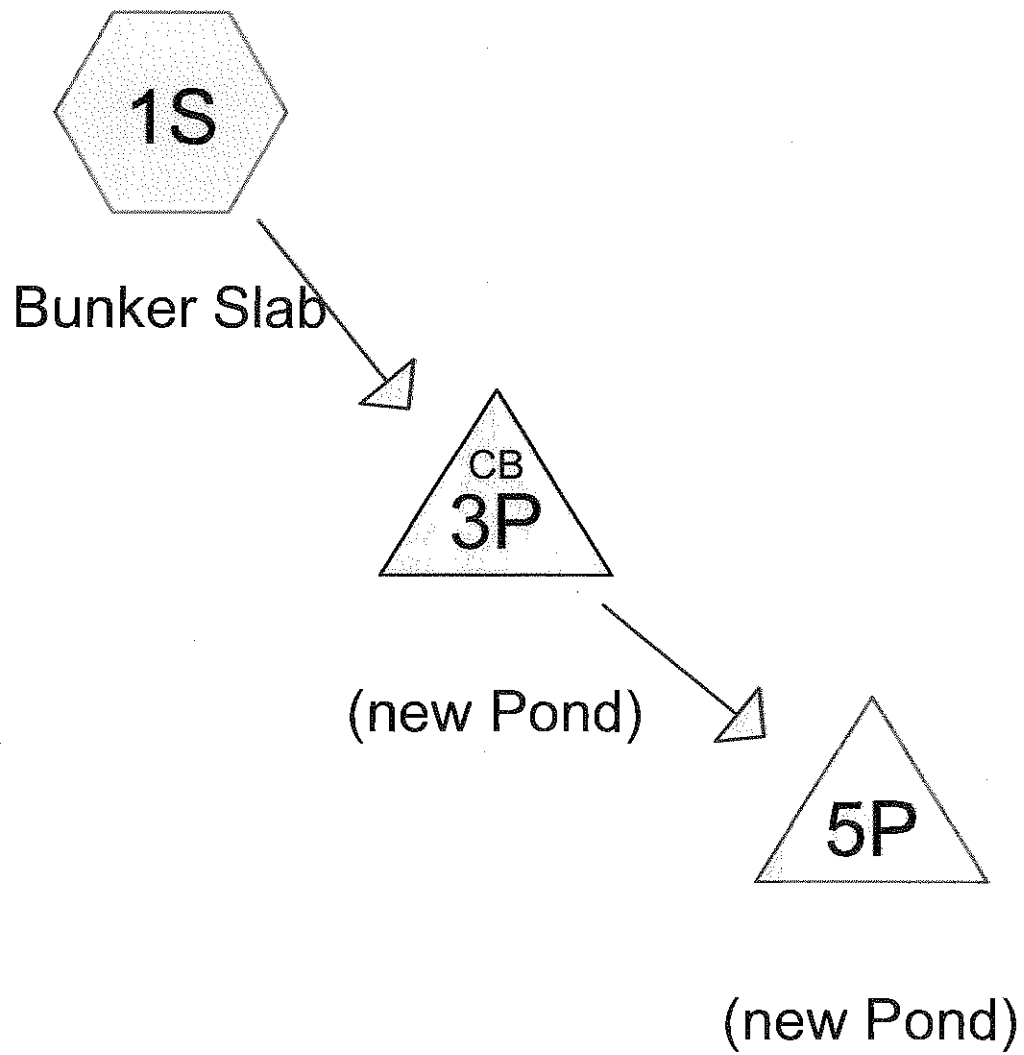
Sincerely,

A handwritten signature in black ink, appearing to read 'P. R. Netemeyer', with a long horizontal stroke extending to the right.

Patrick R. Netemeyer, PE, SE, PLS



1 <small>SHEET 1 OF 1</small>	<p>J. B. TIMMERMANN FARMS, LTD. PART OF THE NORTHEAST QUARTER OF SECTION 28, TOWNSHIP 2 NORTH, RANGE 4 WEST OF THE THIRD PRINCIPAL MERIDIAN, CLINTON COUNTY, ILLINOIS</p> <p>DAVID TIMMERMANN 11601 SOUTH GERMANTOWN ROAD, BREESE, IL 62230 PHONE: (618) 526-7476</p>	<p>NETEMEYER ENGINEERING ASSOCIATES, INC.</p> <p>3300 Highway Road, Aviston, IL 62216 PHONE: (618) 228-7815 FAX: (618) 228-7800</p>
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Timmermann Silage Bunker

Prepared by Netemeyer Engineering Associates, Inc.
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Huff 0-10sm 2Q 24.00 hrs Rainfall=6.02"

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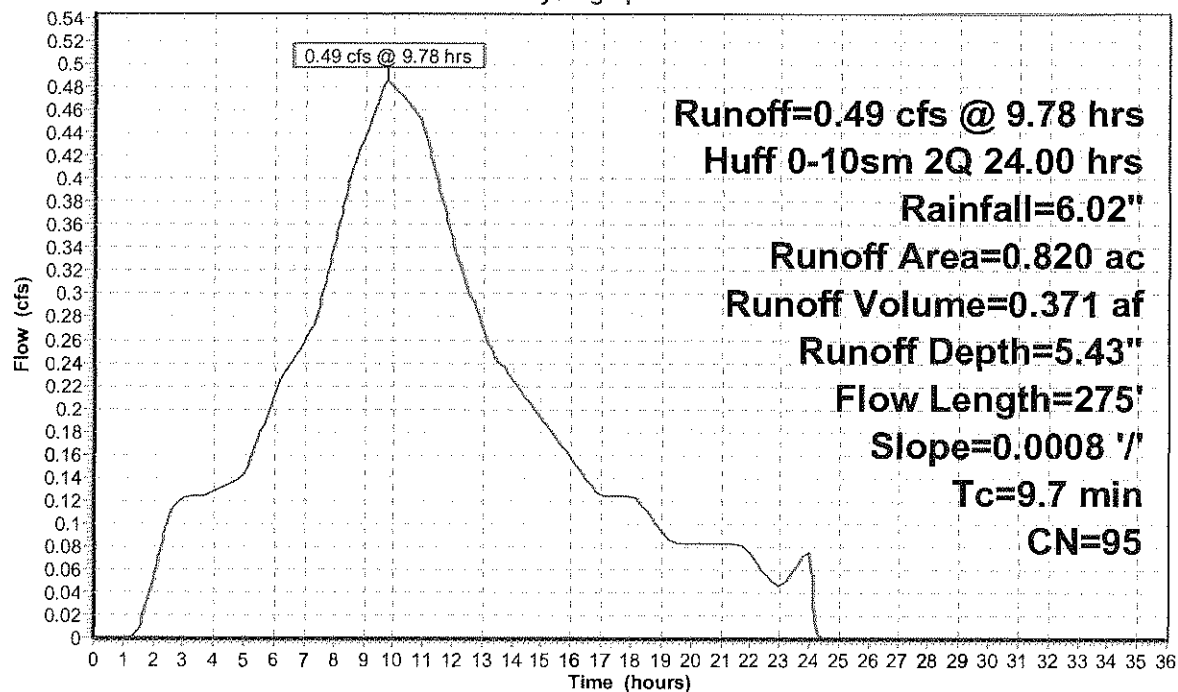
Summary for Subcatchment 1S: Bunker Slab

Runoff = 0.49 cfs @ 9.78 hrs, Volume= 0.371 af, Depth= 5.43"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Huff 0-10sm 2Q 24.00 hrs Rainfall=6.02"

Area (ac)	CN	Description
* 0.820	95	concrete slab
0.820		Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	275	0.0008	0.47		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.28"

Subcatchment 1S: Bunker Slab**Hydrograph**

Summary for Pond 3P: (new Pond)

[57] Hint: Peaked at 0.63' (Flood elevation advised)

Inflow Area = 0.820 ac, 0.00% Impervious, Inflow Depth = 5.43"
Inflow = 0.49 cfs @ 9.78 hrs, Volume= 0.371 af
Outflow = 0.49 cfs @ 9.78 hrs, Volume= 0.371 af, Atten= 0%, Lag= 0.0 min
Primary = 0.49 cfs @ 9.78 hrs, Volume= 0.371 af

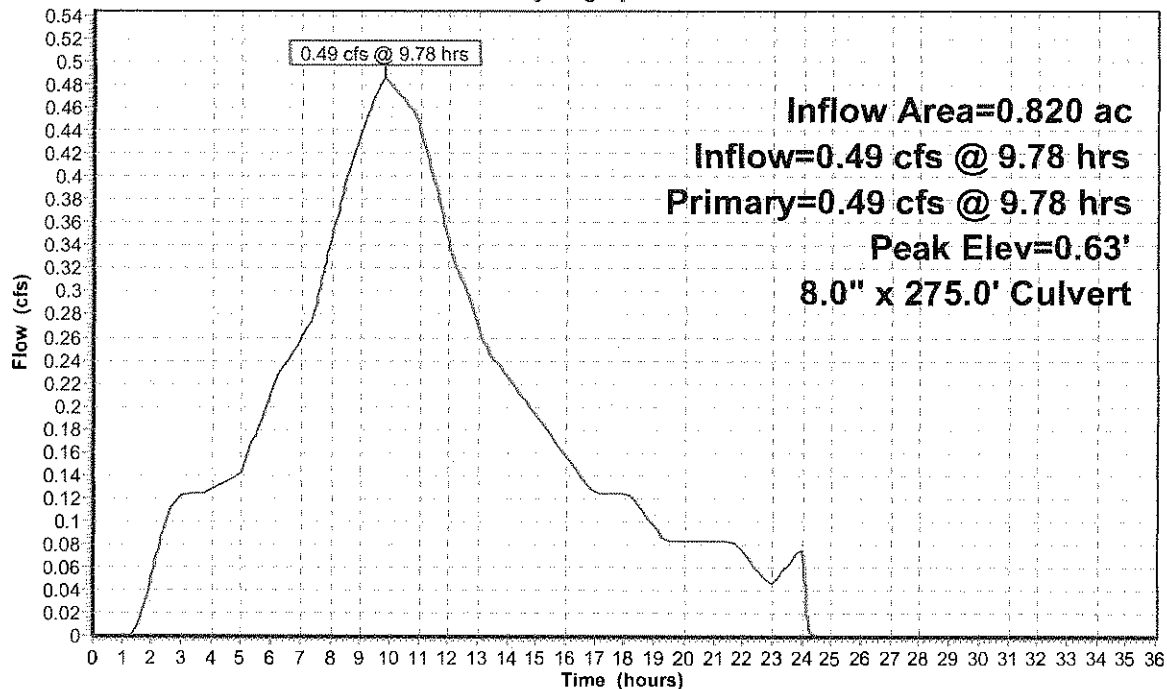
Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 0.63' @ 9.78 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	0.00'	8.0" x 275.0' long Culvert CPP, square edge headwall, Ke= 0.500 Outlet Invert= -0.22' S= 0.0008 '/' Cc= 0.900 n= 0.009

Primary OutFlow Max=0.49 cfs @ 9.78 hrs HW=0.63' TW=-3.47' (Dynamic Tailwater)
1=Culvert (Barrel Controls 0.49 cfs @ 1.84 fps)

Pond 3P: (new Pond)

Hydrograph



Timmermann Silage Bunker

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Huff 0-10sm 2Q 24.00 hrs Rainfall=6.02"

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Summary for Pond 5P: (new Pond)

Inflow Area = 0.820 ac, 0.00% Impervious, Inflow Depth = 5.43"
Inflow = 0.49 cfs @ 9.78 hrs, Volume= 0.371 af
Outflow = 0.44 cfs @ 9.11 hrs, Volume= 0.365 af, Atten= 10%, Lag= 0.0 min
Primary = 0.44 cfs @ 9.11 hrs, Volume= 0.365 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= -0.88' @ 11.07 hrs Surf.Area= 0.001 ac Storage= 0.011 af

Plug-Flow detention time= 22.5 min calculated for 0.365 af (98% of inflow)
Center-of-Mass det. time= 10.8 min (690.0 - 679.3)

Volume	Invert	Avail.Storage	Storage Description
#1	-10.22'	0.012 af	8.00'D x 10.50'H Vertical Cone/Cylinder

Device	Routing	Invert	Outlet Devices
#1	Primary	-5.22'	Special & User-Defined Head (feet) 0.00 0.50 100.00 Disch. (cfs) 0.000 0.440 0.440

Primary OutFlow Max=0.44 cfs @ 9.11 hrs HW=-4.72' (Free Discharge)
↑=Special & User-Defined (Custom Controls 0.44 cfs)

Pond 5P: (new Pond)**Hydrograph**