STATE OF MISSOURI

DEPARTMENT OF NATURAL RESOURCES

MISSOURI CLEAN WATER COMMISSION

CONSTRUCTION PERMIT

The Missouri Department of Natural Resources hereby issues a permit to:

Doulos Ministries, Inc.
3205 N Twyman Road
Independence, MO 64058

for the construction of (described facilities):

See attached.

Permit Conditions:

See attached.

Construction of such proposed facilities shall be in accordance with the provisions of the Missouri Clean Water Law, Chapter 644, RSMo, and regulation promulgated thereunder, or this permit may be revoked by the Department of Natural Resources (Department).

As the department does not examine structural features of design or the efficiency of mechanical equipment, the issuance of this permit does not include approval of these features.

A representative of the department may inspect the work covered by this permit during construction. Issuance of a permit to operate by the department will be contingent on the work substantially adhering to the approved plans and specifications.

This permit applies only to the construction of water pollution control components; it does not apply to other environmentally regulated areas.

March 25, 2015
Effective Date

Sara Parker Pauley

Sara Parker Pauley, Director, Department of Natural Resources

March 24, 2017
Expiration Date

John Madras

John Madras, Director, Water Protection Program

CONSTRUCTION PERMIT

I. CONSTRUCTION DESCRIPTION

The proposed wastewater treatment facility consists of a Bio Microbics 9.0 FAST (Fixed Film Activated Sludge Treatment) unit, a 7,700 gallon time dosed pump tank, and a no discharge subsurface Low Pressure Pipe (LPP) system. The project will use the existing six 2,400 gallon septic pretreatment concrete tanks (two trains with three tanks in series) that will gravity discharge effluent to a Bio Microbics 9.0 FAST unit that will disperse the effluent through a dose tank following a flow meter into the wastewater soil absorption system.

The project will consist of the construction and installation of a Bio-Microbics 9.0 FAST wastewater treatment system to include a flow equalization tank with a capacity of 10,200 gallons and equipped with a regenerative type blower capable of delivering at least 155 cubic feet per minute (CFM) of air, a dose tank with a capacity of 8,000 gallons, two Zoeller model E189 effluent pumps each capable of pumping 145 gallon per minute (gpd) with a total dynamic head of 110 feet, a flow meter, a drain disposal field of 21,260 square feet divided into seven zones (Zone1=2,381 sf; Zone 2=2,689 sf; Zone 3=3,960 sf; Zone 4=3,328 sf; Zone 5=3,595 sf; Zone 6=3,179 sf; Zone 7=2,128 sf), approximately 3000 linear feet of 1 inch polyvinyl chloride (PVC) Standard Dimension Ratio (SDR)-40 pipe inside of 4 inch EZ flow perforated pipe and all the necessary appurtenances make the system complete and usable to treat the waste from a population equivalent of 90 with an average daily discharge of 3,430 gallons. The project will also include general site work appropriate to the scope and purpose of the project.

The construction will take place at the Shelterwood Wastewater Treatment Facility which has the Missouri State Operating Permit No. MOG823049. The no discharge facility locates in Jackson County, Missouri.

II. FINDING OF AFFORDABILITY

The Finding of Affordability is not applicable. The permittee is not a combined or separate sanitary sewer system or a publicly owned treatment works.

III. CONSTRUCTION PERMIT CONDITIONS

The permittee is authorized to construct subject to the following conditions:

1. This construction permit does not authorize discharge.

2. All construction shall be in accordance with the plans and specifications submitted by Residential Sewage Treatment Company Inc. on June 4, 2014.

3. The department must be contacted in writing prior to making any changes to the approved plans and specifications that would directly or indirectly have an impact on the capacity, flow, system layout, or reliability of the proposed wastewater treatment facilities or any design parameter that is addressed by 10 CSR 20-8, in accordance with 10 CSR 20-8.110(8).

4. State and federal law does not permit bypassing of raw wastewater, therefore steps must be taken to ensure that raw wastewater does not discharge during construction. If a sanitary sewer overflow or bypass occurs, report the appropriate information to the department's Kansas City Regional Office per 10 CSR 20-7.015(9)(E)2.

5. This Construction Permit is invalid for projects required to comply with the requirements contained in 10 CSR 20-4, "Grants and Loans"

6. Protection of drinking water supplies shall be in accordance with 10 CSR 20-8.120(10). "There shall be no physical connections between a public or private potable water supply system and a sewer, or appurtenance thereto which would permit the passage of any wastewater or polluted water into the potable supply. No water pipe shall pass through or come in contact with any part of a sewer manhole."

7. Sewers in relation to water works structures shall meet the requirements of 10 CSR 23-3.010 with respect to minimum distances from public water supply wells or other water supply sources and structures.

   A. Sewer mains shall be laid at least 10 feet horizontally from any existing or proposed water main. The distances shall be measured edge-to-edge. In cases where it is not practical to maintain a 10 foot separation, the department may allow a deviation on a case-by-case basis, if supported by data from the design engineer. Such a deviation may allow installation of the sewer closer to a water main, provided that the water main is in a separate trench or on an undisturbed earth shelf located on either side of the sewer and at an elevation so the bottom of the water main is at least 18 inches above the top of the sewer. If it is impossible to obtain proper horizontal and vertical separation as described above for sewers, the sewer must be constructed of slip-on or mechanical joint pipe or continuously encased and be pressure tested to 150 pounds per square inch to assure water tightness.

   B. Manholes should be located at least 10 feet horizontally from any existing or proposed water main.

   C. Manholes shall be located with the top access at or above grade level.

   D. Sewers crossing water mains shall be laid to provide a minimum vertical distance of 18 inches between the outside of the water main and the outside of the sewer. This shall be the case where the water main is either above or below the sewer. The crossing shall be arranged so that the sewer joints will be equidistant and as far as possible from the water main joints. Where a water main crosses under a sewer, adequate structural support shall be provided for the sewer to maintain line and grade. When it is impossible to obtain proper vertical separation as stipulated above, one of the following methods must be specified:
      a. The sewer shall be designed and constructed equal to the water pipe and shall be pressure tested to assure water tightness prior to backfilling; or
      b. Either the water main or sewer line may be continuously encased or enclosed in a watertight carrier pipe which extends ten feet on both sides of the crossing, measured perpendicular to the water main. The carrier pipe shall be of materials approved by the department for use in water main construction.

8. In addition to the requirements for a construction permit, 10 CSR 20-6.200 requires land disturbance activities of one acre or more to obtain a Missouri state operating permit to discharge stormwater. The permit requires best management practices sufficient to control runoff and sedimentation to protect waters of the state. Land disturbance permits will only be obtained by means of the department's ePermitting system available online at www.dnr.mo.gov/env/wpp/epermit/help.htm. See www.dnr.mo.gov/env/wpp/stormwater/sw-land-disturb-permits.htm for more information.

9. A United States (U.S.) Army Corps of Engineers (COE) permit (404) and a Water Quality Certification (401) issued by the department or permit waiver may be required for the activities described in this permit. This permit is not valid until these requirements are satisfied. If construction activity will disturb any land below the ordinary high water mark of jurisdictional waters of the U.S. then a 404/401 will be required. Since the COE makes determinations on what is jurisdictional, you must contact the COE to determine permitting requirements. You may call the department's Water Protection Program at 573-751-1300 for more information. See www.dnr.mo.gov/env/wpp/401/ for more information.

10. Upon completion of construction;

    A. The Doulos Ministries Inc. will become the continuing authority for operation, maintenance, and modernization of these facilities;

    B. Submit the enclosed form Statement of Work Completed to the department in accordance with 10 CSR 20-6.010(5)(D);

    C. Submit an electronic copy of the as builts if the project was not constructed in accordance with previously submitted plans and specifications;

IV. REVIEW SUMMARY

1. CONSTRUCTION PURPOSE

The purpose of this construction is to replace the failing subsurface gravity fed chamber lateral field. The proposed project is the additional of a Bio Microbics 9.0 FAST unit and a subsurface Low Pressure Pipe (LPP) system.

2. FACILITY DESCRIPTION

Wastewater from the facility is currently collected using both gravity and grinder pump to gravity flowing to a central location and divided into two equal flows. Each flow is directed through three 2,400 gallon septic tanks in series and then combined for distribution to the failing chamber system.

The new system will leave the septic tanks for pre-treatment and direct the combine flow to the Bio-Microbic 9.0 FAST unit, an 8,000 gallon time dosed pump tank, and a subsurface Low Pressure Pipe (LPP) system. The proposed system is capable of handling 3,430 gallons per day hydraulic flow and 500 mg/L BOD organic load.

3. COMPLIANCE PARAMETERS

The new facility is no-discharge domestic wastewater treatment facilities, with no industrial contributions. Land application shall be controlled, limited and monitored by the facility. Monitoring requirement includes irrigation period, volume irrigated, application area, etc.

4. REVIEW of MAJOR TREATMENT DESIGN CRITERIA

The facility is a boarding school with less than 90 residents which includes students and teachers. The proposed wastewater treatment system will treat domestic waste water from the 90 residents at the school. The system will be able to treat 3,430 GPD flow and 500 mg/L BOD organic loading. Samples were taken on two different occasions from the pre-treatment tank and the BOD never exceeded 250mg/L.

The drinking water usage from the city of Independence during July 2010 to April 2013 (appendix A) was provided to the department. The average daily drinking water usage was 2551 gallon per day or 31 gallon per resident per day. The treatment system was designed based on the past water usage. The owner must monitor the effluent flow to ensure the daily applied rate to the drain field is less than the design flow of 3430 gallon per day. Also as redundancy, the facility has identified an area equal to the current soil treatment area at the property the facility already owns and willing to enlarge its drain field if and when it is needed.

5. OPERATING PERMIT MODIFICATION

The current general permit MOG823049 without modification will continue serve as an operating permit for the facility.

Lei Hou, PE
Engineering Section
lei.hou@dnr.mo.gov

APPENDIX A–WATER USAGE

Water Usage

City of Independence Water Bill Information:

	# of days	usage (CCF)	gal/day*		monthly res.	gal/res.*
Jul-10	37	98	1981		78	25
Aug-10	28	211	5637		82	69
Sep-10	32	45	1052		87	12
Oct-10	28	122	3260		86	38
Nov-10	29	104	2683		81	33
Dec-10	28	102	2725		77	35
Jan-11	35	102	2180		72	30
Feb-11	30	160	3990		78	51
Mar-11	29	158	4076		83	49
Apr-11	32	50	1169		79	15
May-11	28	91	2431		71	34
Jun-11	31	136	3282		70	47
Jul-11	31	38	917		66	14
Aug-11	31	81	1955		67	29
Sep-11	32	87	2034		68	30
Oct-11	28	77	2057		71	29
Nov-11	30	81	2020		75	27
Dec-11	29	61	1574		74	21
Jan-12	33	88	1995		88	23
Feb-12	31	97	2341		92	25
Mar-12	31	86	2075		90	23
Apr-12	28	132	3527		93	38
May-12	28	124	3313		92	36
Jun-12	31	144	3475		84	41
Jul-12	34	196	4313		81	53
Aug-12	28	168	4489		88	51
Sep-12	28	81	2164		96	23
Oct-12	30	87	2169		95	23
Nov-12	31	77	1858		101	18
Dec-12	30	81	2020		101	20
Jan-13	30	61	1521		99	15
Feb-13	33	77	1746		97	18
Mar-13	30	97	2419		96	25
Apr-13	28	86	2298		95	24
	1032		86745	2551		31
				avg daily usage		avg resident usage

* - more than 3000 gal/day, or 35 gal/resident/day

RECEIVED MAY 19 2014 WATER PROTECTION PROGRAM

CP0001654
AP 18529 C13351

MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM

APPLICATION FOR CONSTRUCTION PERMIT – WASTEWATER TREATMENT FACILITY

FOR DEPARTMENT USE ONLY	
APP NO.	CP NO.
FEE RECEIVED $1000.00	CHECK NO. 1601
DATE RECEIVED 5/19/14	SB

APPLICATION OVERVIEW

The Application for Construction Permit – Wastewater Treatment Facility form has been developed in a modular format and consists of Part A and B. **All applicants must complete Part A.** Part B should be completed for applicants who currently land-apply wastewater or propose land application for wastewater treatment. **Please read the accompanying instructions before completing this form. Submittal of an incomplete application may result in the application being returned.**

PART A – BASIC INFORMATION

1.0 APPLICATION INFORMATION (Note – If any of the questions in this section are answered NO, this application may be considered incomplete and returned.)

1.1 Is this a Federal/State funded project? ☐ YES ☑ N/A Funding Agency: _____ Project #: _____

1.2 Has the Missouri Department of Natural Resources approved the proposed project's antidegradation review?
☐ YES Date of Approval: _____
☐ Attached is the No Degradation Evaluation Conclusion of Antidegradation Review form

1.3 Has the department approved the proposed project's facility plan*?
☐ YES Date of Approval: _____ ☑ NO ☐ N/A (If Not Applicable, complete No. 1.4.)

1.4 [Complete only if answered Not Applicable on No. 1.3.] Is a copy of the engineering report* for wastewater treatment facilities with a design flow less than 22,500 gpd included with this application?
☑ YES ☐ NO

1.5 Is a copy of the appropriate plans* and specifications* included with this application?
☑ YES Denote which form is submitted: ☑ Hard copy ☐ Electronic copy (See instructions.) ☐ NO

1.6 Is a summary of design* included with this application? ☑ YES ☐ NO

1.7 Has the appropriate operating permit application (A, B, or B2) been submitted to the department?
☐ YES Date of submittal: _____
☑ Enclosed is the appropriate operating permit application submittal. Denote which form: ☐ A ☑ B ☐ B2
☐ N/A Please explain: _____

1.8 Is the facility currently under enforcement with the department or the Environmental Protection Agency? ☐ YES ☑ NO

1.9 Is the appropriate fee included with this application? ☑ YES ☐ NO (See instructions for appropriate fee.)

* Must be affixed with a Missouri registered professional engineer's seal, signature and date.

2.0 PROJECT INFORMATION

2.1 NAME OF PROJECT
The Sky's the Limit / Shelterwood

2.2 PROJECT DESCRIPTION
Addition of an onsite treatment plant, dosing tank, and low pressure pipe field

2.3 SLUDGE HANDLING, USE AND DISPOSAL DESCRIPTION
Contract hauler

2.4 DESIGN INFORMATION

A. Current population: 90 ; Design population: 130

B. Actual Flow: 2551 gpd; Design Average Flow: 8970 gpd;
Actual Peak Daily Flow: 6210 gpd; Design Maximum Daily Flow: 9000 gpd

2.5 ADDITIONAL INFORMATION

A. Is a topographic map attached? ☐ YES ☑ NO

B. Is a process flow diagram attached? ☑ YES ☐ NO

3.0 WASTEWATER TREATMENT FACILITY

NAME	TELEPHONE NUMBER WITH AREA CODE	E-MAIL ADDRESS
The Sky's the Limit / Shelterwood	913-526-7575	jsubers@shelterwood.org

ADDRESS (PHYSICAL)	CITY	STATE	ZIP CODE	COUNTY
3205 N. Twyman Rd	Independence	MO	64058	Jackson

Wastewater Treatment Facility: Mo- (Outfall Of)

3.1 Legal Description: SW ¼, NE ¼, SE ¼, Sec. 11, T 50N, R 31W
(Use additional pages if construction of more than one outfall is proposed.)

3.2 UTM Coordinates Easting (X): 3909384 Northing (Y): 09417275
For Universal Transverse Mercator (UTM), Zone 15 North referenced to North American Datum 1983 (NAD83)

3.3 Name of receiving streams: _____

4.0 PROJECT OWNER

NAME	TELEPHONE NUMBER WITH AREA CODE	E-MAIL ADDRESS
Doulos Ministries , Inc	(913) 526-7575	jsubers@shelterwood.org

ADDRESS	CITY	STATE	ZIP CODE
3205 N. Twyman Rd	Independence	MO	64058

5.0 CONTINUING AUTHORITY: Permanent organization that will serve as the continuing authority for the operation, maintenance and modernization of the wastewater collection system.

NAME	TELEPHONE NUMBER WITH AREA CODE	E-MAIL ADDRESS
Shelterwood	(913) 526-7575	jsubers@shelterwood.org

ADDRESS	CITY	STATE	ZIP CODE
3205 N. Twyman Rd	Independence	MO	64058

5.1 A letter from the continuing authority, if different than the owner, is included with this application. ☐ YES ☐ NO ☑ N/A

5.2 COMPLETE THE FOLLOWING IF THE CONTINUING AUTHORITY IS A MISSOURI PUBLIC SERVICE COMMISSION REGULATED ENTITY.

A. Is a copy of the certificate of convenience and necessity included with this application? ☐ YES ☐ NO

5.3 COMPLETE THE FOLLOWING IF THE CONTINUING AUTHORITY IS A PROPERTY OWNERS ASSOCIATION.

A. Is a copy of the as-filed restrictions and covenants included with this application? ☐ YES ☐ NO

B. Is a copy of the as-filed warranty deed, quitclaim deed or other legal instrument which transfers ownership of the land for the wastewater treatment facility to the association included with this application? ☐ YES ☐ NO

C. Is a copy of the as-filed legal instrument (typically the plat) that provides the association with valid easements for all sewers included with this application? ☐ YES ☐ NO

D. Is a copy of the Missouri Secretary of State's nonprofit corporation certificate included with this application? ☐ YES ☐ NO

6.0 ENGINEER

ENGINEER NAME / COMPANY NAME	TELEPHONE NUMBER WITH AREA CODE	E-MAIL ADDRESS
Tom Fritts / Bob Quick/Residential Sewage Treatment	(816) 966-8885	jessi@residentialsewage.com

ADDRESS	CITY	STATE	ZIP CODE
12800 2nd Street	Grandview	MO	64030

7.0 PROJECT OWNER: I hereby certify that I am familiar with the information contained in this application and to the best of my knowledge and belief such information is true, complete, and accurate, and if granted this permit, I agree to abide by the Missouri Clean Water Law and all rules, regulations, orders, and decisions, subject to any legitimate appeal available to applicant under Missouri Clean Water Law. I also understand the issuance of the construction permit does not guarantee the proposed wastewater treatment will meet the required effluent limitations of the issued Missouri State Operating Permit for this facility.

PROJECT OWNER SIGNATURE		
PRINTED NAME		DATE
TITLE OR CORPORATE POSITION	TELEPHONE NUMBER WITH AREA CODE	E-MAIL ADDRESS

Mail completed copy to:
MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM
P.O. BOX 176
JEFFERSON CITY, MO 65102-0176

END OF PART A.
REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHETHER PART B NEEDS TO BE COMPLETE.

PART B – LAND APPLICATION ONLY
(Submit only if the proposed construction project includes land application of wastewater.)

8.0 FACILITY INFORMATION

8.1 Type of wastewater to be irrigated: ☑ Domestic ☐ State/National Park ☐ Seasonal business
☐ Municipal ☐ Municipal with a pretreatment program or significant industrial users
☐ Other (explain) _____

8.2 Months when the business or enterprise will operate or generate wastewater:
☑ 12 months per year ☐ Part of the year (list months): _____

8.3 This system is designed for:
☐ No-discharge.
☐ Partial irrigation when feasible and discharge rest of time.
☐ Irrigation during recreational season, April – October, and discharge during November – March.
☐ Other (explain) _____.

See design

9.0 STORAGE BASINS

9.1 Number of storage basins: _____ (Use additional pages if greater than three basins.)

9.2 Type of basins: ☐ Steel ☑ Concrete ☐ Fiberglass ☐ Earthen ☐ Earthen with membrane liner

9.3 Storage basin dimensions at inside top of berm (feet). Report freeboard as feet from top of berm to emergency spillway or overflow pipe.

	Length	Width	Depth	Freeboard	Berm Width	% Slope
Basin #1:	_____	_____	_____	_____	_____	_____
Basin #2:	_____	_____	_____	_____	_____	_____
Basin #3:	_____	_____	_____	_____	_____	_____

9.4 Storage Basin operating levels (report as feet below emergency overflow level).

	Maximum operating water level	Minimum operating water level
Basin #1:	_____ ft	_____ ft
Basin #2:	_____ ft	_____ ft
Basin #3:	_____ ft	_____ ft

See design

9.5 Design depth of sludge in storage basins.
Basin #1: _____ ft Basin #2: _____ ft Basin #3: _____ ft

9.6 Existing sludge depth, if the basins are currently in operation.
Basin #1: _____ ft Basin #2: _____ ft Basin #3: _____ ft

9.7 Total design sludge storage: _____ dry tons and _____ cubic feet

10.0 LAND APPLICATION SYSTEM

10.1 Number of irrigation sites _____ Total Acres _____ Maximum % field slopes _____
Location: _____ ¼, _____ ¼, _____ ¼, _____ Sec. _____ T _____ R _____ County _____ Acres
Location: _____ ¼, _____ ¼, _____ ¼, _____ Sec. _____ T _____ R _____ County _____ Acres
Location: _____ ¼, _____ ¼, _____ ¼, _____ Sec. _____ T _____ R _____ County _____ Acres
(Use additional pages if greater than three irrigation sites.)

10.2 Type of vegetation: ☐ Grass hay ☐ Pasture ☐ Timber ☐ Row crops
☐ Other (describe) _____

See Design

10.3 Wastewater flow (dry weather) gallons per day: Average annual _____ Seasonal _____ Off-season _____

10.4 Land application rate (design flow including 1-in-10 year storm water flows):

Design:	_____ inches/year	_____ inches/hour	_____ inches/day	_____ inches/week
Actual:	_____ inches/year	_____ inches/hour	_____ inches/day	_____ inches/week

10.5 Total irrigation per year (gallons): Design: _____ gal Actual: _____ gal

10.6 Actual months used for irrigation (check all that apply):
☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec

10.7 Land application rate is based on:
☑ Hydraulic Loading ☐ Other (describe) _____
☐ Nutrient Management Plan (N&P) If N&P is selected, is the plan included? ☐ YES ☐ NO