PIONEER MUNICIPAL HIGH INCOME TRUST Form N-O

September 29, 2014

OMB APPROVAL

OMB Number: 3235-0578 Expires: January 31, 2016 Estimated average burden hours per response..... 10.5

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM N-Q

QUARTERLY SCHEDULE OF PORTFOLIO HOLDINGS OF REGISTERED MANAGEMENT INVESTMENT COMPANY

Investment Company Act file number 811-21321

 $\hbox{ Pioneer Pioneer Municipal High Income Trust} \\ \hbox{(Exact name of registrant as specified in charter)} \\$

60 State Street, Boston, MA 02109 (Address of principal executive offices) (ZIP code)

Terrence J. Cullen, Pioneer Investment Management, Inc., 60 State Street, Boston, MA 02109 (Name and address of agent for service)

Registrant's telephone number, including area code: (617) 742-7825

Date of fiscal year end: April 30

Date of reporting period: July 31, 2014

Form N-Q is to be used by management investment companies, other than small business investment companies registered on Form N-5 (239.24 and 274.5 of this chapter), to file reports with the Commission, not later than 60 days after close of the first and third fiscal quarters, pursuant to Rule 30b1-5 under the Investment Company Act of 1940 (17 CFR 270.30b1-5). The Commission may use the information provided on Form N-Q in its regulatory, disclosure review, inspection, and policymaking roles.

A registrant is required to disclose the information specified by Form N-Q, and the Commission will make this information public. A registrant is not required to respond to the collection of information contained in Form N-Q unless the Form displays a currently valid Office of Management and Budget ("OMB") control number. Please direct comments concerning the accuracy of the information collection burden estimate and any suggestions for reducing the burden to Secretary, Securities and Exchange Commission, 450 Fifth Street, NW, Washington, DC 20549-0609. The OMB has reviewed this collection of information under the clearance requirements of 44 U.S.C. ss. 3507.

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ITEM 1. Schedule of Investments.

File the schedules as of the close of the reporting period as set forth in ss. 210.12-12 12-14 of Regulation S-X [17 CFR 210.12-12 12-14]. The schedules need not be audited.

Pioneer Municipal High Income Trust NQI July 31, 2014

Ticker Symbol: MHI

Principal Amount USD (\$)	S&P/Moody's Ratings	Value
4,500,000	TAX EXEMPT OBLIGATIONS - 130.4% of Net Assets Alabama - 1.4% NR/NRHuntsville-Redstone Village Special Care Facilities Financing Authority Nursing Home Revenue, 5.5%, 1/1/43	\$ 4,223,745
24,000	Arizona - 0.0%† NR/Baa3Pima County Industrial Development Authority Education Revenue, 6.75%, 7/1/31	\$ 24,062
3,000,000(a	Nonprofit Corp., Revenue, 5.75%, 7/1/37	\$ 3,213,450
1,000,000	Development Authority Recovery Zone Facility Revenue, 8.5%, 4/1/31	1,607,151 1,022,250

	California Municipal Finance	
5,000,000	Authority, 5.75%, 7/1/30 NR/Baa3California Pollution Control	
2,000,000	Financing Authority, 5.0%,	
	7/1/37 (144A)	5,074,950
1,740,000	BB+/NRCalifornia School Finance	
	Authority, 7.375%, 10/1/43	1,916,662
1,400,000	NR/NRCalifornia Statewide	
	Communities Development	1 442 000
569 006(h)(a)	Authority, 5.625%, 11/1/33 NR/NRCalifornia Statewide	1,442,098
568,006(b)(c)	Communities Development	
	Authority Environmental	
	Facilities Revenue, 9.0%,	
	12/1/38	6
15,000,000(d)	NR/NRInland Empire Tobacco	
	Securitization Authority	
	Revenue, 0.0%, 6/1/36	2,991,750
7,885,000(e)	AA/WRLehman Municipal Trust	
	Receipts Revenue, RIB, 0.0%,	
2 000 000	9/20/28 (144A)	10,419,397
2,000,000	B-/B3Tobacco Securitization	
	Authority of Northern	
	California Revenue, 5.375%, 6/1/38	1,604,060
3,000,000	BB+/B2Tobacco Securitization	1,004,000
3,000,000	Authority of Southern	
	California Revenue, 5.0%,	
	6/1/37	2,373,150
		\$ 31,664,924
	Colorado - 1.5%	
1,500,000	B+/NRColorado Educational &	
	Cultural Facilities Authority,	* . **
2 000 000	8.0%, 9/1/43	\$ 1,526,910
2,000,000	A-/NRColorado Health Facilities	
	Authority Revenue, 5.25%, 5/15/42	2,040,860
1,000,000	NR/NRKremmling Memorial	2,040,000
1,000,000	Hospital District Certificate of	
	Participation, 7.125%,	
	12/1/45	833,190
		\$ 4,400,960
	Connecticut - 6.1%	
1,000,000	NR/NRHamden Connecticut Facility	
	Revenue, 7.75%, 1/1/43	\$ 1,043,740
10,335,000(e)	AAA/WRLehman Municipal Trust	
	Receipts Revenue, 0.0%,	12 401 702
5 000 000	8/21/35 P/NPMohagan Triba of Indians	12,401,793
5,000,000	B/NRMohegan Tribe of Indians Gaming Authority, 6.25%,	
	1/1/31	5,003,550
	1/1/01	2,002,220

			\$ 18,449,083	
	5,000,000	District of Colombia - 3.8% BBB/Baa1District of Columbia Tobacco		
		Settlement Financing Corp.,	¢ 5 521 250	
	6,000,000	6.5%, 5/15/33 BBB/Baa1District of Columbia Tobacco	\$ 5,531,350	
	0,000,000	Settlement Financing Corp.,		
		6.75%, 5/15/40	5,999,700	
			\$ 11,531,050	
	1,500,000	Florida - 6.6% NR/NRAlachua County Health		
	1,200,000	Facilities Authority Revenue,		
		8.125%, 11/15/41	\$ 1,720,545	
	1,500,000	NR/NRAlachua County Health		
		Facilities Authority Revenue, 8.125%, 11/15/46	1,717,440	
	500,000	NR/B1Capital Trust Agency Revenue		
		Bonds, 7.75%, 1/1/41	515,670	
	5,000,000	AA-/Aa3Florida's Turnpike Enterprise	7. 160.6 7 0	
1,000,000(a)	NP/WPHillshore	Revenue Bonds, 4.0%, 7/1/34	5,169,650	
1,000,000(a)	NR/WRHillsborough County Industrial Development			
Authority Revenue, 8.0%,		-		
	8/15/32	1,326,920		
	Principal			
	-	rP/Moody's		
	USD (\$) Rat	tings	Value	
		Florida - (continued)		
	2,260,000(b)	NR/NRLiberty County Subordinate		
	, , , , ,	Revenue, 8.25%, 7/1/28	\$ 678,407	
	2,500,000	A/A2Miami-Dade County Florida		
		Aviation Revenue, 5.5%, 10/1/41	2,780,200	
	2,250,000(e)	NR/NRSt. Johns County Industrial	2,780,200	
	_, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Development Authority		
		Revenue, 1.344%, 1/1/49	897,480	
	832,581	NR/NRSt. Johns County Industrial		
		Development Authority Revenue, 2.5%, 1/1/49	8	
	5,000,000	NR/Baa1Tallahassee Health Facilities	0	
		Revenue, 6.375%, 12/1/30	5,014,900	
		C	\$ 19,821,220	
	4,240,000(e)	Georgia - 5.2% AA/WRAtlanta Georgia Water and		
	1,2 10,000(0)	Wastewater Revenue, RIB,		
		0.0%, 11/1/43 (144A)	\$ 4,349,943	
	2,500,000	B+/B1Clayton County Development		
		Authority Revenue, 8.75%,	2 105 550	
		6/1/29	3,105,550	

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3,445,000	B+/B1Clayton County Development	
, ,	Authority Revenue, 9.0%,	
	6/1/35	3,612,289
4,000,000	AA/Aa2Private Colleges &	-,- ,
.,,,,,,,,	Universities Authority	
	Revenue, 5.0%, 10/1/43	4,470,160
	10 volide, 5.0 %, 10/1/15	\$ 15,537,942
	Idaho - 1.7%	Ψ 13,337,742
5,000,000	A-/Baa1Power County Industrial	
3,000,000	*	
	Development Corp., Revenue,	¢ 5 007 000
	6.45%, 8/1/32	\$ 5,007,900
	Illinois - 15.2%	
- 1,827,000(d)	NR/NRIllinois Finance Authority	
, , (,	Revenue, 0.0%, 11/15/52	\$ 160,408
2,087,000(e)	NR/NRIllinois Finance Authority	4 100,.00
2,007,000(0)	Revenue, 4.0%, 11/15/52	1,352,585
3,865,000	BBB+/NRIllinois Finance Authority	1,332,303
3,803,000	•	4,140,497
2,000,000	Revenue, 6.0%, 8/15/38	4,140,497
2,000,000	AA+/Aa2Illinois Finance Authority	2 200 060
1 140 000	Revenue, 6.0%, 8/15/39	2,308,960
1,140,000	NR/NRIllinois Finance Authority	1 1 10 500
	Revenue, 6.375%, 5/15/17	1,140,502
2,500,000	NR/Baa3Illinois Finance Authority	
	Revenue, 6.5%, 4/1/39	2,671,025
240,000	NR/NRIllinois Finance Authority	
	Revenue, 7.0%, 11/15/17	232,402
500,000	NR/NRIllinois Finance Authority	
	Revenue, 7.0%, 5/15/18	500,155
345,000	NR/NRIllinois Finance Authority	
	Revenue, 7.0%, 11/15/27	311,807
1,700,000	NR/NRIllinois Finance Authority	
	Revenue, 7.625%, 5/15/25	1,753,669
600,000	NR/NRIllinois Finance Authority	
	Revenue, 7.75%, 5/15/30	610,626
2,000,000	NR/NRIllinois Finance Authority	
	Revenue, 8.0%, 5/15/40	2,022,600
3,200,000	NR/NRIllinois Finance Authority	
, ,	Revenue, 8.0%, 5/15/46	3,230,240
2,000,000	NR/NRIllinois Finance Authority	-,, -
_,,,,,,,,	Revenue, 8.125%, 2/15/40	2,063,000
4,000,000	NR/NRIllinois Finance Authority	_,,,,,,,,
.,,	Revenue, 8.25%, 5/15/45	2,649,840
2,500,000	NR/NRIllinois Finance Authority	2,015,010
2,500,000	Revenue, 8.25%, 2/15/46	2,585,875
16,880,000(d)	AAA/A3Metropolitan Pier &	2,505,075
10,000,000(u)	Exposition Authority	
	Dedicated State Tax Revenue,	
	0.0%, 6/15/22	16 065 244
1 225 000	NR/NRSouthwestern Illinois	16,965,244 1,061,749
1,325,000		1,001,749
	Development Authority	

Revenue, 5.625%, 11/1/26

\$ 45,761,184

Indiana - 1.7%

250,000 NR/NRCity of Carmel Indiana

Nursing Home Revenue,

7.0%, 11/15/32 \$ 266,613

Schedule of Investments | 7/31/14 (unaudited) (continued)

750,000	NR/NRCity of Carmel Indiana
	Nursing Home Revenue,

3,500,000

		7.125%, 1	1/15/42	796,335	
	Principal Amount USD (\$)	S&P/N Rating	Moody's		Value
				Indiana - (continued)	
	500,	,000	NR/N	RCity of Carmel Indiana	
				Nursing Home Revenue,	¢ 520.220
3,570,000		NR/N	7.125%, 11/15/47 (RVigo County Hospital	\$ 529,230	
	-,,	,		Authority Revenue, 5.8%,	
				9/1/47 (144A)	3,520,091
				V 1 1 . 007	\$ 5,112,269
	5,000,	000	NR/Ras	Kentucky - 1.9% a2Kentucky Economic	
	3,000,	,000	MODU	Development Finance	
				Authority Revenue, 6.375%,	
				6/1/40	\$ 5,598,250
				Louisiana - 3.1%	
	2,260,	,000	BB+/Ba	al Jefferson Parish Hospital	
				Service District No. 2,	
	1.500	000	DDD/D	6.375%, 7/1/41	\$ 2,439,015
	1,500,	,000	ввв/ва	a3Louisiana Local Government Environmental Facilities &	
				Community Development	
				Authority Revenue, 6.75%,	
	5 000	000	ND D	11/1/32	1,668,675
	5,000,	,000	NR/Baa	a1Louisiana Public Facilities Authority Revenue, 5.5%,	
				5/15/47	5,230,700
					\$ 9,338,390
	4 700	000) ID (D	Maine - 1.9%	
	1,500,	,000	NR/Ba	a1Maine Health & Higher Educational Facilities	
				Authority Revenue, 7.5%,	
				7/1/32	\$ 1,732,080

AA-/Aa3Maine Turnpike Authority Revenue, 5.0%, 7/1/42

3,852,555