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PIONEER MUNICIPAL HIGH INCOME TRUST  
Form N-Q  
April 01, 2011

OMB APPROVAL

OMB Number: 3235-0578  
Expires: April 30, 2013  
Estimated average burden  
hours per response.....  
10.5

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

FORM N-Q

CERTIFIED SHAREHOLDER REPORT OF REGISTERED  
MANAGEMENT INVESTMENT COMPANIES

Investment Company Act file number 811-21321

Pioneer Municipal High Income Trust  
(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: January 31, 2011

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 270.30b-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.

Pioneer Municipal High Income  
Trust  
SCHEDULE OF  
INVESTMENTS 1/31/11  
(unaudited)

Principal Amount	S&P/Moody's Ratings (unaudited)		Value
		TAX EXEMPT OBLIGATIONS - 129.2% of Net Assets	
\$ 1,000,000	NR/NR	Alabama - 1.4% Huntsville-Redstone Village Special Care Facilities Financing Authority, 5.5%, 1/1/28	\$ 805,100
4,500,000	NR/NR	Huntsville-Redstone Village Special Care Facilities Financing Authority, 5.5%, 1/1/43	3,204,540
			\$ 4,009,640
5,000,000	BBB-/Baa3	Arizona - 2.5% Apache County Industrial Development Authority, 5.85%, 3/1/28	\$ 4,839,900
994,000	NR/Baa3	Pima County Industrial Development Authority, 6.75%, 7/1/31	913,228
960,000	NR/Baa3	Pima County Industrial Development Authority, 7.25%, 7/1/31	933,562
500,000	NR/Baa2	Yavapai County Industrial Development Authority, 6.0%, 8/1/33	478,615
			\$ 7,165,305
7,885,000(a)	AA+/NR	California - 7.4% California State University Revenue, RIB, 10.609%, 11/1/39 (144A)	\$ 6,250,913
602,382(b)	NR/NR	California Statewide Communities Development Authority Environmental Facilities Revenue, 9.0%, 12/1/38	34,637
1,000,000	BB+/NR	California Statewide Communities Development	969,170

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		Authority Revenue, 7.25%, 10/1/38		
5,150,000 †	AAA/Aaa	Golden State Tobacco Securitization Corp., 7.8%, 6/1/42		5,931,976
7,000,000 †	AAA/Aaa	Golden State Tobacco Securitization Corp., 7.875%, 6/1/42		8,074,430
			\$	21,261,126
1,000,000	NR/NR	Colorado - 0.3% Kremmling Memorial Hospital District Project, 7.125%, 12/1/45	\$	915,460
10,335,000(a)	AA+/NR	Connecticut - 5.4% Connecticut Health & Educational Facilities Authority Revenue, RIB, 11.129%, 7/1/42 (144A)	\$	10,596,992
1,000,000	NR/NR	Hamden Facility Revenue Bonds, Series 2009A, 7.75%, 1/1/43		1,014,650
5,000,000	CCC+/NR	Mohegan Tribe Indians Gaming Authority, 6.25%, 1/1/31		3,809,450
			\$	15,421,092
5,000,000	BBB/Baa3	District of Columbia - 3.6% District of Columbia Tobacco Settlement Financing Corp., 6.5%, 5/15/33	\$	4,800,800
6,000,000	BBB/Baa3	District of Columbia Tobacco Settlement Financing Corp., 6.75%, 5/15/40		5,602,440
			\$	10,403,240
1,700,000	NR/NR	Florida - 5.4% Beacon Lakes Community Development, 6.9%, 5/1/35	\$	1,567,043
1,000,000	NR/NR	Florida Development Finance Corp, 6.0%, 9/15/40		833,730
1,000,000 †	NR/WR	Hillsborough County Industrial Development Authority Revenue, 8.0%, 8/15/32		1,360,980
2,390,000	NR/NR	Liberty County Subordinate Revenue, 8.25%, 7/1/28		2,336,560
2,500,000	A-/A2	Miami-Dade County Aviation Revenue, 5.5%, 10/1/41		2,362,825
1,000,000	NR/NR	St. Johns County Industrial Development Authority Revenue, 5.25%, 1/1/26		800,350
2,000,000	NR/NR	St. Johns County Industrial Development Authority Revenue, 5.375%, 1/1/40		1,429,500

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5,000,000	NR/Baa1	Tallahassee Health Facilities Revenue, 6.375%, 12/1/30		4,838,450
			\$	15,529,438
4,240,000(a)	NR/Aaa	Georgia - 2.5% Atlanta Georgia Water & Waste Revenue, RIB, 10.609%, 11/1/43 (144A)	\$	3,360,751
500,000	CCC+/NR	Clayton County Development Authority Revenue, 9.0%, 6/1/35		534,920
2,400,000	NR/NR	Fulton County Residential Care Facilities Revenue, 5.0%, 7/1/27		1,615,512
1,100,000	NR/NR	Fulton County Residential Care Facilities Revenue, 5.125%, 7/1/42		654,632
1,000,000	NR/NR	Rockdale County Development Authority Revenue, 6.125%, 1/1/34		872,990
			\$	7,038,805
5,000,000	BBB+/Baa1	Idaho - 1.8% Power County Industrial Development Corp., 6.45%, 8/1/32	\$	5,008,500
2,000,000(c)	NR/NR	Illinois - 18.4% Centerpoint Intermodal Center, 8.5%, 6/15/23 (144A)	\$	1,997,300
12,000,000	NR/Caa2	Chicago O'Hare International Airport Special Facility Revenue Refunding Bonds, 5.5%, 12/1/30		9,176,520
1,000,000	NR/NR	Illinois Finance Authority Revenue, 6.0%, 11/15/27		747,350
3,865,000	BBB+/NR	Illinois Finance Authority Revenue, 6.0%, 8/15/38		3,581,464
2,000,000	AA+/Aa2	Illinois Finance Authority Revenue, 6.0%, 8/15/39		2,044,120
4,000,000	NR/NR	Illinois Finance Authority Revenue, 6.0%, 11/15/39		2,734,760
2,450,000	NR/NR	Illinois Finance Authority Revenue, 6.375%, 5/15/17		2,382,159
2,500,000	NR/Baa2	Illinois Finance Authority Revenue, 6.5%, 4/1/39		2,495,850
500,000	NR/NR	Illinois Finance Authority Revenue, 7.0%, 5/15/18		480,940
1,700,000	NR/NR	Illinois Finance Authority Revenue, 7.625%, 5/15/25		1,605,361
600,000	NR/NR	Illinois Finance Authority Revenue, 7.75%, 5/15/30		565,122
2,000,000	NR/NR	Illinois Finance Authority Revenue, 8.0%, 5/15/40		1,879,980
3,200,000	NR/NR			3,000,864

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			Illinois Finance Authority Revenue, 8.0%, 5/15/46	
2,500,000	NR/NR		Illinois Finance Authority Revenue, 8.25%, 2/15/46	2,387,550
4,000,000	NR/NR		Illinois Finance Authority Revenue, 8.25%, 5/15/45	3,836,960
1,500,000(b)	NR/NR		Illinois Health Facilities Authority Revenue, 6.9%, 11/15/33	560,400
16,880,000(d)	AAA/A2		Metropolitan Pier & Exposition Authority Dedicated State Tax Revenue, 0.0%, 6/15/22	12,258,762
1,625,000	NR/NR		Southwestern Illinois Development Authority Revenue, 5.625%, 11/1/26	1,097,200
				\$ 52,832,662
\$ 5,000,000	A+/A1		Indiana - 3.7% Indiana Health & Educational Facility Financing Authority Hospital Revenue, 5.0%, 2/15/39	\$ 4,265,450
4,300,000	BBB-/WR		Indiana State Development Finance Authority Revenue, 5.75%, 10/1/11	4,326,230
2,570,000	NR/NR		Vigo County Hospital Authority Revenue, 5.8%, 9/1/47 (144A)	2,080,621
				\$ 10,672,301
1,500,000	BBB-/Ba2		Louisiana - 1.9% Louisiana Local Government Environmental Facilities Revenue, 6.75%, 11/1/32	\$ 1,511,250
5,000,000	NR/NR		Louisiana Public Facilities Authority Revenue, 5.5%, 5/15/47	3,982,100
				\$ 5,493,350
1,000,000	NR/NR		Maryland - 0.3% Maryland Health & Higher Educational Facilities Authority Revenue, 6.25%, 1/1/45	\$ 939,950
5,000,000	A/WR		Massachusetts - 7.0% Massachusetts Development Finance Agency Revenue, 5.75%, 1/1/42	\$ 4,921,600
2,360,000	NR/NR		Massachusetts Development Finance Agency Revenue, 7.1%, 7/1/32	2,120,082
955,000	AA/NR		Massachusetts Educational Financing Authority Revenue, 6.0%, 1/1/28	969,420
3,500,000 †	NR/Baa2			3,804,325

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		Massachusetts Health & Educational Facilities Authority Revenue, 6.25%, 7/1/22		
4,500,000	NR/NR	Massachusetts Health & Educational Facilities Authority Revenue, 6.5%, 1/15/38		3,645,045
5,000,000	BB-/NR	Massachusetts Health & Educational Facilities Authority Revenue, 6.75%, 10/1/33		4,520,800
			\$	19,981,272
935,000	NR/NR	Michigan - 2.9% Doctor Charles Drew Academy, 5.7%, 11/1/36	\$	574,034
1,340,000	NR/Ba1	Flint Michigan Hospital Building Authority Revenue, 5.25%, 7/1/16		1,272,075
1,500,000	BB/NR	John Tolfree Health System Corp., 6.0%, 9/15/23		1,223,955
5,830,000	BB/NR	Michigan Tobacco Settlement Finance Authority, 6.0%, 6/1/48		3,901,786
1,450,000	BBB/NR	Star International Academy Certificates of Participation, 6.125%, 3/1/37		1,286,165
7,720,000(e)(g)	NR/NR	Wayne Charter Escrow, 0.0%, 12/1/15		-
			\$	8,258,015
1,675,000	BB-/NR	Minnesota - 0.6% Duluth Economic Development Authority Health Care Facilities Revenue, 7.25%, 6/15/32	\$	1,676,407
3,000,000	BBB/Ba1	Mississippi - 1.0% Mississippi Business Finance Corp. Pollution Control Revenue, 5.9%, 5/1/22	\$	2,922,810
1,600,000(b)	NR/NR	Montana - 0.1% Two Rivers Authority, Inc. Correctional Facility Improvement Revenue, 7.375%, 11/1/27	\$	244,000
2,000,000(b)	NR/NR	Nebraska - 0.2% Grand Island Solid Waste Disposal Facilities Revenue, 7.0%, 6/1/23	\$	553,160
2,000,000(b)	NR/NR	Nevada - 0.0% Nevada State Department of Business & Industry, 7.25%, 1/1/23	\$	20

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1,000,000	B/B3	New Jersey - 11.8% New Jersey Economic Development Authority Revenue, 6.25%, 9/15/19	\$	945,780
13,350,000	B/B3	New Jersey Economic Development Authority Revenue, 6.25%, 9/15/29		12,084,286
6,150,000(c)	B/B3	New Jersey Economic Development Authority Revenue, 7.0%, 11/15/30		6,020,358
10,370,000	AA+/Aa1	New Jersey Transportation Trust Fund Authority, 0.0%, 12/15/27		3,653,351
10,000,000 †	AAA/Aaa	Tobacco Settlement Financing Corp., 6.75%, 6/1/39		11,333,400
			\$	34,037,175
1,500,000	NR/NR	New Mexico - 1.3% Otero County New Mexico Project Revenue, 6.0%, 4/1/23	\$	1,293,810
2,960,000	NR/NR	Otero County New Mexico Project Revenue, 6.0%, 4/1/28		2,334,256
			\$	3,628,066
3,000,000	NR/NR	New York - 8.1% Dutchess County Industrial Development Agency Revenue, 7.5%, 3/1/29	\$	2,827,620
2,000,000	BBB+/NR	Hempstead Local Development Corp. Revenue Bonds, 5.75%, 7/1/39		1,966,900
2,050,000	NR/NR	Nassau County New York Industrial Development Agency Revenue, 6.7%, 1/1/43		1,809,658
990,000	CCC+/Caa2	New York City Industrial Development Agency, 6.9%, 8/1/24		874,328
2,000,000	BB-/B1	New York City Industrial Development Agency, 7.625%, 12/1/32		2,003,960
2,000,000	B-/Caa2	New York City Industrial Development Agency, 8.0%, 8/1/12		2,047,780
1,000,000	NR/Ba1	New York State Dormitory Authority Revenue, 6.125%, 12/1/29		939,890
7,040,000(a)	NR/Aaa	New York State Dormitory Authority Revenue, RIB, 12.572%, 7/1/26 (144A)		8,160,064
3,000,000	NR/NR	Suffolk County Industrial Development Agency, 7.25%, 1/1/30		2,768,280
			\$	23,398,480

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	4,935,000	NR/NR	North Carolina - 3.1% Charlotte North Carolina Special Facilities Revenue, 5.6%, 7/1/27	\$	4,037,620
	4,795,000	NR/NR	Charlotte North Carolina Special Facilities Revenue, 7.75%, 2/1/28		4,794,520
				\$	8,832,140
\$	1,225,000	B-/Caa2	Oklahoma - 1.9% Tulsa Municipal Airport Revenue, 6.25%, 6/1/20	\$	1,157,062
	4,350,000	B-/Caa2	Tulsa Municipal Airport Revenue, 7.35%, 12/1/11		4,330,686
				\$	5,487,748
	3,000,000	BB-/B2	Pennsylvania - 3.5% Allegheny County Hospital Development Authority Revenue, 5.0%, 11/15/28	\$	2,091,870
	1,550,000	NR/Baa2	Allegheny County Hospital Development Authority Revenue, 5.125%, 5/1/25		1,327,032
	1,000,000	CCC/NR	Columbia County Hospital Authority Health Care Revenue, 5.9%, 6/1/29		783,260
	755,000	BBB/Ba1	Hazleton Health Services Authority Hospital Revenue, 5.625%, 7/1/17		732,259
	1,280,000(b)	NR/Ca	Langhorne Manor Borough Higher Education & Health Authority Revenue, 7.35%, 7/1/22		479,232
	5,000,000	B-/Caa2	Pennsylvania Economic Development Financing Authority Solid Waste Disposal Revenue, 6.0%, 6/1/31		4,180,450
	500,000	BBB+/NR	Pennsylvania Higher Educational Facilities Authority Revenue, 5.4%, 7/15/36		457,440
				\$	10,051,543
	6,000,000	NR/NR	Rhode Island - 1.7% Central Falls Detention Facilities Revenue, 7.25%, 7/15/35	\$	4,801,020
	3,185,000 †	BBB+/Baa1	South Carolina - 1.5% South Carolina Jobs Economic Development Authority Revenue, 6.375%, 8/1/34	\$	3,589,495
	665,000 †	BBB+/Baa1	South Carolina Jobs Economic Development Authority Revenue, 6.375%, 8/1/34		752,807
				\$	4,342,302

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7,000,000 †	NR/A2	Tennessee - 4.9% Johnson City Health & Educational Facilities Board Hospital Revenue, 7.5%, 7/1/33	\$	7,726,460
2,480,000	NR/NR	Knox County Health, Educational & Housing Facilities Board Hospital Revenue, 6.375%, 4/15/22		2,604,273
4,600,000	BBB+/NR	Sullivan County Health, Educational & Housing Facilities Board Hospital Revenue, 5.25%, 9/1/36	\$	3,877,294 14,208,027
1,345,000	NR/Ba2	Texas - 14.5% Bexar County Housing Finance Corp., 8.0%, 12/1/36	\$	968,091
1,000,000	CCC+/Caa2	Dallas-Fort Worth International Airport Revenue, 6.0%, 11/1/14		968,150
4,000,000	NR/NR	Decatur Hospital Authority Revenue, 7.0%, 9/1/25		3,861,800
769,709(b)	NR/NR	Gulf Coast Industrial Development Authority Revenue, 7.0%, 12/1/36		44,258
3,750,000	CCC+/B3	Houston Airport System Special Facilities Revenue, 5.7%, 7/15/29		3,197,325
5,340,000	NR/NR	Lubbock Health Facilities Development Corp., 6.625%, 7/1/36		4,635,974
10,000,000	BBB+/A3	North Texas Tollway Authority Revenue, 5.75%, 1/1/33		9,418,400
2,810,000(a)	NR/Aaa	Northside Independent School District, RIB, 10.964%, 6/15/33 (144A)		2,859,962
2,000,000	NR/NR	Tarrant County Cultural Education Facilities Finance Corp., 8.0%, 11/15/34		1,913,860
1,000,000	NR/NR	Tarrant County Cultural Education Facilities Finance Corp., 8.125%, 11/15/39		952,810
1,500,000	NR/NR	Tarrant County Cultural Education Facilities Finance Corp., 8.25%, 11/15/44		1,447,755
7,040,000(a)	NR/Aaa	Texas State, RIB, 11.81%, 4/1/30 (144A)		7,223,814
5,000,000	NR/NR	Willacy County Local Government Corp. Revenue, 6.875%, 9/1/28	\$	4,145,550 41,637,749

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800,000	NR/NR	Utah - 0.2% Spanish Fork City Charter School Revenue, 5.55%, 11/15/26 (144A)	\$	627,104
1,500,000	A-/Baa1	Vermont - 0.5% Vermont Educational & Health Buildings Financing Agency Revenue, 6.0%, 10/1/28	\$	1,514,910
1,000,000	BBB/Baa2	Virginia - 0.3% Peninsula Ports Authority, 6.0%, 4/1/33	\$	1,001,610
4,710,000	A+/Aa3	Washington - 9.5% Spokane Public Facilities District Hotel/Motel Tax & Sales, 5.75%, 12/1/27	\$	4,786,961
7,025,000	BBB/Baa3	Tobacco Settlement Authority Revenue, 6.625%, 6/1/32		6,871,293
14,315,000	AA+/Aa1	Washington State General Obligation, 0.0%, 6/1/22		8,636,240
3,795,000	A/A2	Washington State Health Care Facilities Authority Revenue, 6.0%, 1/1/33		3,713,332
5,000,000	NR/NR	Washington State Housing Finance Committee Nonprofit Revenue, 5.625%, 1/1/27		3,385,500
2,320,000(e)(g)	NR/NR	Wisconsin - 0.0% Aztalan Wisconsin Escrow, 0.0%, 5/1/18	\$	-
		TOTAL TAX-EXEMPT OBLIGATIONS (Cost \$382,629,084)	\$	371,287,753
		MUNICIPAL COLLATERALIZED DEBT OBLIGATION - 2.1% of Net Assets		
10,000,000(c)(f)	NR/NR	Non-Profit Preferred Funding Trust I, 12.0%, 9/15/37 (144A)	\$	6,067,400
		TOTAL MUNICIPAL COLLATERALIZED DEBT OBLIGATION (Cost \$10,000,000)	\$	6,067,400
Shares		COMMON STOCK - 1.0% of Net Assets		
250,413(g)		Delta Air Lines, Inc.	\$	2,922,320

TOTAL COMMON STOCK (Cost \$6,612,756)	\$	2,922,320
TOTAL INVESTMENTS IN SECURITIES - 132.3% (Cost \$399,241,840)(h)(i)	\$	380,277,473
OTHER ASSETS AND LIABILITIES 2.8%	\$	8,073,759
PREFERRED SHARES AT REDEMPTION VALUE, INCLUDING DIVIDENDS PAYABLE - (35.1)%	\$	(101,006,723)
NET ASSETS APPLICABLE TO COMMON SHAREOWNERS - 100.0%	\$	287,344,509

RIB Residual Interest Bonds

NR Security not rated by S&P or Moody's.

WR Withdrawn Rating.

(144A) Security is exempt from registration under Rule 144A of the Securities Act of 1933. Such securities may be resold normally to qualified institutional buyers in a transaction exempt from registration. At January 31, 2011, the value of these securities amounted to \$49,224,921, or 17.1% of net assets applicable to common shareowners.

† Prerefunded bonds have been collateralized by U.S. Treasury securities or U.S. Government Agencies which are held in escrow to pay interest and principal on the tax exempt issue and to retire the bonds in full at the earliest refunding date.

(a) The interest rate is subject to change periodically and inversely based upon prevailing market rates. The interest rate shown is the coupon rate at January 31, 2011

(b) Security is in default and is non-income producing.

(c) The interest rate is subject to change periodically. The interest rate shown is the coupon rate at January 31, 2011.

(d) Debt obligation initially issued at one coupon rate which converts to a higher coupon rate at a specific date.  
The rate shown is the coupon rate at January 31, 2011.

(e) Security is valued using fair value methods (other than prices supplied by independent pricing services.)

(f) Indicates a security that has been deemed illiquid. The aggregate cost of illiquid securities is \$10,000,000.  
The aggregate fair value is \$6,067,400, or 2.1% of the total net assets applicable to common shareowners.

(g) Non-income producing.

(h) The concentration of investments by type of obligation/market sector is as follows:

Insured:

NATL-RE	6.8
AMBAC	1.3
MBIA	1.0
FSA	1.0
PSF	0.8
ACA	0.3

Revenue Bonds:

Health Revenue	28.2
Other Revenue	13.5
Tobacco Revenue	12.3
Airport Revenue	9.9
Development Revenue	8.6
Education Revenue	4.7
Facilities Revenue	4.3
Pollution Control Revenue	3.5
Transportation Revenue	2.5
Gaming Revenue	1.0
Housing Revenue	0.3
Utilities Revenue*	-

100.0

\*Amount is less than 0.1%

(i) At January 31, 2011, the net unrealized loss on investments based on cost for federal income tax purposes of \$396,885,858 was as follows:

Aggregate gross unrealized gain for all investments in which there is an excess of value over tax cost	\$	21,989,768
Aggregate gross unrealized loss for all investments in which there is an excess of tax cost over value		(38,598,153)
Net unrealized loss	\$	(16,608,385)

For financial reporting purposes net unrealized loss on investments was \$18,964,367 and cost of investments aggregated \$399,241,840.

Purchases and sales of securities (excluding temporary cash investments) for the period ended

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January 31, 2011, aggregated \$30,630,076 and \$29,890,258, respectively.

Various inputs are used in determining the value of the Trust's investments. These inputs are summarized in the three broad levels listed below.

Highest priority is given to Level 1 inputs and lowest priority is given to Level 3.

Level 1 – quoted prices in active markets for identical securities

Level 2 – other significant observable inputs (including quoted prices for similar securities, interest rates, prepayment speeds, credit risk, etc.)

Level 3 – significant unobservable inputs (including the Trust's own assumptions in determining fair value of investments)

The following is a summary of the inputs used as of January 31, 2011, in valuing the Trust's investments:

	Level 1	Level 2	Level 3	Total
Tax exempt obligations	\$-	\$371,287,753	\$-	\$371,287,753
Tax exempt obligations (Michigan)	-	-	-	-
Tax exempt obligations (Wisconsin)	-	-	-	-
Municipal collateralized debt obligation	-	6,067,400	-	6,067,400
Common stock	2,922,320	-	-	2,922,320
Total	\$2,922,320	\$377,355,153	\$-	\$380,277,473

The following is a reconciliation of assets using significant unobservable inputs (Level 3):

	Balance as of 4/30/10	Realized gain (loss)	Change in unrealized appreciation (depreciation)	Net purchases (sales)	Transfer in and out of Level 3*
Tax exempt obligations (Michigan)	\$-	\$-	\$ -	\$-	\$-
Tax exempt obligations (Wisconsin)	-	-	-	-	-
Ending balance	\$-	\$-	\$ -	\$-	\$-

\*Transfers are calculated beginning of period.

ITEM 2. CONTROLS AND PROCEDURES.

(a) Disclose the conclusions of the registrant's principal executive officer or officers and principal financial officer or officers, or persons performing similar functions, about the effectiveness of the registrant's disclosure controls and procedures (as defined in Rule 30a-3(c) under the Act (17 CFR 270.30a-3(c))) as of a date within 90 days of the filing date of the report that includes the disclosure required by this paragraph, based on their evaluation of these controls and procedures required by Rule 30a-3(b) under the Act (17 CFR 270.30a-3(b)) and Rule 13a-15(b) or 15d-15(b) under the Exchange Act (17 CFR 240.13a-15(b) or 240.15d-15(b)).

The registrant's principal executive officer and principal financial officer have concluded that the registrant's disclosure controls and procedures are effective based on their evaluation of these controls and procedures as of a date within 90 days of the filing date of this report.

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(b) Disclose any change in the registrant's internal controls over financial reporting (as defined in Rule 30a-3(d) under the Act (17 CFR 270.30a-3(d)) that occurred during the registrant's last fiscal quarter that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting.

There were no significant changes in the registrant's internal control over financial reporting that occurred during the second fiscal quarter of the period covered by this report that have materially affected, or are reasonably likely to materially affect, the registrant's internal control over financial reporting.

### ITEM 3. EXHIBITS.

(a) A separate certification for each principal executive officer and principal financial officer of the registrant as required by Rule 30a-2 under the Act (17 CFR 270.30a-2).

Filed herewith.

<PAGE>

### SIGNATURES

[See General Instruction F]

Pursuant to the requirements of the Securities Exchange Act of 1934 and the Investment Company Act of 1940, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

(Registrant) Pioneer Municipal High Income Trust

By (Signature and Title)\* /s/ John F. Cogan, Jr.  
John F. Cogan, Jr, President

Date April 1, 2011

Pursuant to the requirements of the Securities Exchange Act of 1934 and the Investment Company Act of 1940, this report has been signed below by the following persons on behalf of the registrant and in the capacities and on the dates indicated.

By (Signature and Title)\* /s/ John F. Cogan, Jr.  
John F. Cogan, Jr., President

Date April 1, 2011

By (Signature and Title)\* /s/ Mark Bradley  
Mark Bradley, Treasurer

Date April 1, 2011

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\* Print the name and title of each signing officer under his or her signature.